Massachusetts Department of
ELEMENTARY & SECONDARY
EDUCATION

District Data Team Toolkit

Helping districts establish, grow, and
maintain a culture of inquiry and data use.

MODULES

Introduction
Getting Ready
Inquiry
Information
Knowledge
Action
Results

District Data Team Toolkit

MODULE 0: INTRODUCTION TO THE TOOLKIT

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Introduction

Tools and Resources for the Introduction

0.1.1R: Objectives for All Modules

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0.2.1T: District Data Team Self-Assessment

INTRODUCTION

Welcome to the District Data Team Toolkit. This Toolkit is designed to help a district establish, grow, and maintain a culture of inquiry and data use that can inform decisions that impact teaching and learning, and ultimately improve the achievement of all students. This short introduction will help you understand and navigate the tools and resources available to support this work.
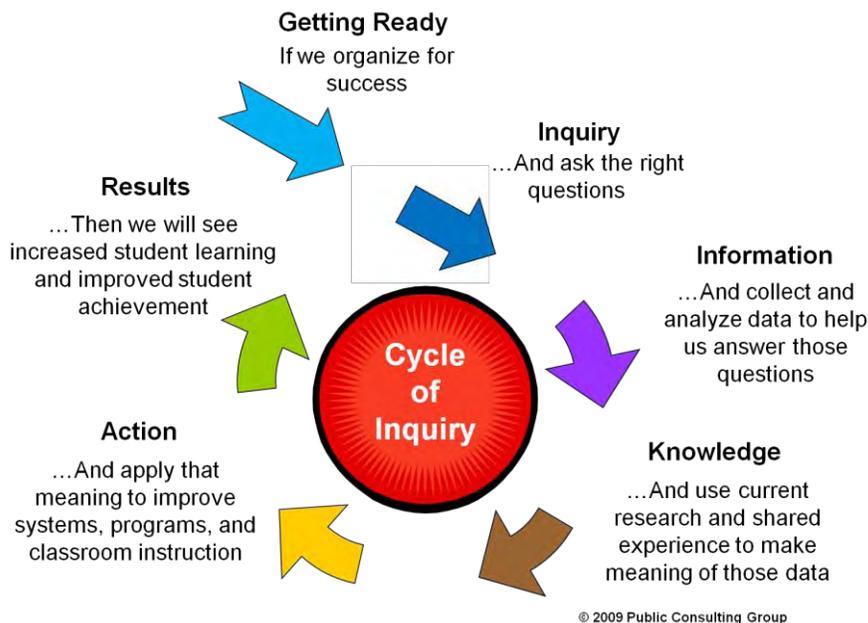
WHAT IS THE TOOLKIT?

Ensuring the effective use of inquiry and data district-wide involves many tasks and types of expertise. For that reason, this Toolkit is designed to assist in the establishment of a District Data Team—a cadre of staff who is collectively responsible for the technical, organizational, and substantive aspects of data use. These Team members must be data literate and able to lead the collaborative inquiry process with both district and school staff. Members of the District Data Team work with district staff and school-level data teams to:

- Craft questions about accountability, equity, and continuous improvement
- Coordinate the collection, analysis, and dissemination of data displays that are necessary to address these essential questions
- Build action plans
- Monitor progress of improvement initiatives

These activities can help build the capacity of a District Data Team to engage in inquiry and use data to inform district-level decisions. Over time, the Team can engage the entire staff in using multiple data sources to continuously improve teaching and learning throughout the district. Districts that engage with the Toolkit should plan for a multi-year commitment to increase and embed a capacity for effective data use.

The Toolkit is designed around a theory of action, the Data-Driven Inquiry and Action Cycle (see diagram) on the next page, which provides a foundation for effective data use. The Cycle provides a structure that takes data use from asking the right questions to getting results. It is an iterative process in which the district uses data to target and support continuous improvement. A disciplined application of this kind of data-driven approach can build a district and school environment that is focused on continuous improvement grounded in evidence. This Cycle is also the basis for the ESE Education Data Warehouse trainings, which further provide excellent tools to access and analyze data. But analyzing data alone will not result in continuous improvement. Concrete actions that are grounded in evidence and continually monitored through the collection and analysis of multiple forms of data are critical to achieve improved results.

Cycle of Inquiry

Getting Ready — If we organize for success

Inquiry — …And ask the right questions

Information — …And collect and analyze data to help us answer those questions

Knowledge — …And use current research and shared experience to make meaning of those data

Action — …And apply that meaning to improve systems, programs, and classroom instruction

Results — …Then we will see increased student learning and improved student achievement

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HOW CAN THE TOOLKIT HELP OUR DISTRICT?

Districts and schools gather enormous amounts of data throughout the school year. These data have historically been collected merely to comply with external requirements. Increasingly, educators are seeking ways to use data systemically for their own learning and to inform decisions about curriculum, instruction, resource allocation, and other vital functions at district and school levels.

The ESE District Data Team Toolkit can help district staff:

- Organize a District Data Team to facilitate productive use of data throughout the district

- Learn and practice the steps of an effective data use model

- Access and apply tools and resources to support a process of inquiry

Engaging with this Toolkit can help a district identify and/or refine a focus for improvement, including determining if current improvement efforts are having the desired effect on student learning outcomes. For example, a district may frame an inquiry process around one aspect of an existing District Improvement Plan as a means to delve deeply into questions about the impact of the related initiatives. Once a District Data Team has built its own capacity for data use and a culture of inquiry, it will be better poised to support such efforts with principals, teachers, and other stakeholders in the district.

WHAT'S IN THE TOOLKIT?

The Toolkit has seven modules – this Introduction, and six modules aligned to the Data-Driven Inquiry and Action Cycle. Each module contains objectives, detailed information, tools, and resources to help implement the work.

1. **Getting Ready** module provides guidance on forming a District Data Team and taking steps to build a solid foundation for building a culture of inquiry and systemic data use. The module addresses the need for systems to inventory, collect, and disseminate the data. It also has information to promote assessment literacy and help manage change.

2. **Inquiry** module launches a process of inquiry by identifying high-level questions of importance to the district, generating clarifying questions to focus the inquiry, and identifying data needed to answer them. The module includes guidance for effective data displays and data overviews.

3. **Information** module guides the process of analyzing the data identified in Inquiry, first making factual observations about the data and then generating inferences about what the data mean.

4. **Knowledge** module helps place information (analyzed quality data) into the context of research and practice to accurately define the problem and identify possible solutions.

5. **Action** module provides frameworks for putting new knowledge to work by developing a logic model and articulating clear measures that will guide and focus the work, and then by creating an action plan (if necessary). If the information and knowledge gained from quality data analysis are not acted on, data collection efforts are wasted and improvement won't occur!

6. **Results** module shares methods for monitoring the work, evaluating the impact, making mid-course corrections if necessary, and communicating the outcomes with stakeholders.

HOW SHOULD THE TOOLKIT BE USED?

The Toolkit is designed for district-level staff, to promote the skills and knowledge necessary to build their capacity to effectively use inquiry and data to inform district-level decisions. As a District Data Team gains comfort with the tools, resources, and processes in the Toolkit, it can plan ways to share them with school-and teacher-level data teams.

Each of the modules provides specific tools and activities to implement the steps of the inquiry process. Some tools are best used electronically. It is important to understand, however, that superimposing a process does not necessarily yield a positive result. A district must be mindful of doing what it can to embed a culture of inquiry and data use that goes beyond technical compliance with processes.

HOW DO I NAVIGATE THE TOOLKIT?

No matter the entry point taken, the Toolkit is designed to support ready access to tools and resources as a District Data Team needs them, using a numbering system to make finding the right tool quick and efficient.

$$3.2.1T$$

Module   Activity   Tool or Resource Number

When an activity has multiple tools or resources associated with it, they are numbered sequentially and designated with either a T (tool) or an R (resource).

Tools *are templates, protocols, organizers, or other items that the Team will work with to build its knowledge and expertise.*

Resources *provide further reading, documentation, or guidance to help the Team use the tools or expand its understanding.*

Activity 0.1 Overview of Toolkit Contents

These documents summarize elements of the Toolkit in order to assist a district in engaging with ones that will be most useful to its work.

(0.1.1R: Objectives for All Modules)
(0.1.2R: Tools and Resources for All Modules)

WHERE SHOULD OUR DISTRICT BEGIN?

Districts should begin by engaging with the *District Data Team Self-Assessment*, at the end of this Introduction module, which will help determine the district's strengths and areas of need in regards to data use and a culture of inquiry. The *Self-Assessment* aligns with each of the modules and therefore can help the district identify where to begin engaging with the Toolkit – which modules, tools, and resources would most help the district move forward with its work.

If in doubt, a district might gain the most value from starting in *Module 1:* Getting Ready and working through the Toolkit sequentially, committing to a multi-year process of building robust use of data at the district level. If the District Data Team has been in existence for several years and needs to work on refining processes and policies that support data use, it may find it useful to go directly to certain tools in the Toolkit.

Activity 0.2 District Data Team Self-Assessment

This self-assessment can help a district determine its strengths and needs, and how best to use this Toolkit to support inquiry and data use.

(0.2.1T: District Data Team Self-Assessment)

Many thanks to all the individuals who contributed to the creation of this Toolkit, including a number of personnel from:

Public Consulting Group (PCG);

MA ESE Offices of Urban District Assistance, School Improvement Grants Management, Information Technology, Data Collection, and the Center for Curriculum and Instruction; and

Brockton, Chelsea, Fitchburg, Holyoke, and Lynn Public School Districts.

For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

OBJECTIVES FOR ALL MODULES   0.1.1R

Purpose	To provide an overview of the objectives for all modules in the District Data Team Toolkit.
Description	In conjunction with the *Introduction* and *Self-Assessment*, this summary can help a District Data Team identify the parts of the Toolkit that might be most useful to its work.
Time	N/A

Related Documents
0–Introduction
0.1.2R: Tools and
     Resources for All
     Modules

Module 1 (Getting Ready) will help a district:
- ▶ Set the vision for data use across the district
- ▶ Build a culture of inquiry to promote systemic data use
- ▶ Establish a District Data Team to drive this work
- ▶ Build data literacy
- ▶ Understand types of data that inform inquiry
- ▶ Establish systems and policies to inventory, collect, and disseminate data
- ▶ Manage the change process

Module 2 (Inquiry) will help a District Data Team use the above roles and vision to:
- ▶ Formulate questions to drive an inquiry process
- ▶ Create and present effective data displays and data overviews
- ▶ Identify the data needed to answer the questions

Module 3 (Information) will help a District Data Team use the above questions and data to:
- ▶ Collect and organize data relevant to the inquiry process
- ▶ Distinguish between observations and inferences
- ▶ Make inferences from multiple sources of data

Module 4 (Knowledge) will help a District Data Team use the inferences generated above to:
- ▶ Clearly articulate a problem statement
- ▶ Identify and explore root causes of the problem
- ▶ Cross-reference solutions with research and local knowledge
- ▶ Begin to capture information on the district's improvement efforts

Module 5 (Action) will help a District Data Team use the knowledge generated above to:
- ▶ Craft a logic model or theory of action to guide subsequent action and evaluation
- ▶ Articulate meaningful measures of implementation and change
- ▶ Develop action plans, if necessary, to implement new strategies or to implement existing strategies more effectively

Module 6 (Results) will help a District Data Team use the action plan generated above to:
- ▶ Decide what to evaluate
- ▶ Develop an evaluation plan
- ▶ Analyze evaluation data
- ▶ Identify and develop a communication strategy
- ▶ Continue the process of inquiry

TOOLS AND RESOURCES FOR ALL MODULES 0.1.2R

Purpose	To provide an overview of the tools and resources available in all modules of the District Data Team Toolkit.	**Related Documents** 0–Introduction 0.1.1R: Objectives for All Modules
Description	In conjunction with the *Introduction* and *Self-Assessment*, this list of tools and resources can help a District Data Team identify the parts of the Toolkit that might be most useful to its work.	
Time	N/A	

Module 0: Introduction

0.1.1R: Objectives for All Modules

0.1.2R: Tools and Resources for All Modules

0.2.1T: District Data Team Self-Assessment

Module 1: Getting Ready (Organize for Success)

1.1.1T: Functions of a District Data Team	1.5.3R: ESE Data Resources
1.2.1T: Barriers to Effective Data Use	1.6.1T: Data Collection Self-Assessment
1.3.1T: Vision for Data Use	1.7.1T: Data Dissemination Schedule Template
1.4.1T: Norm Setting Protocol	1.7.2R: Data Dissemination Schedule Example
1.4.2T: Data Team Meeting Agenda	1.7.3R: ESE Policies for Data Access
1.4.3T: Data Team Meeting Minutes	1.8.1T: Data Literacy Training Catalog
1.5.1T: Data Inventory Template	1.8.2R: Assessment Glossary
1.5.2T: Data Inventory Template: SIMS and EPIMS Data	1.9.1T: Managing Change and Understanding Concerns Protocol

Module 2: Inquiry (Ask the Right Questions)

2.1.1T: Question Formulation Protocol	2.4.2R: Data Display Rubric
2.2.1T: Inventory of District and School Initiatives	2.4.3R: Types of Data Displays
2.3.1T: Data Overview Checklist	2.4.4R: More Data Display Resources
2.3.2R: Data Overview Example	2.5.1T: Data Overview Brainstorming Protocol
2.4.1T: Building Data Displays Protocol	2.5.2T: Focusing Question Investigation Template

Module 3: Information (Collect and Analyze Data)

3.1.1T: Data Collection Planning Tool	*Also revisit*
3.2.1T: Practice Making Valid Inferences	2.4.1T: Building Data Displays Protocol
3.3.1T: Data Analysis Protocol	2.4.2R: Data Display Rubric
	2.4.3R: Types of Data Displays
	2.4.4R: More Data Display Resources

Module 4: Knowledge (Make Meaning of Data)

4.1.1T: Writing a Problem Statement	4.2.5T: Dimensions Bulls-Eye
4.2.1T: Why, Why, Why?	4.3.1T: Problem Investigation Plan
4.2.2T: 20 Reasons	4.3.2R: Educational Research Websites
4.2.3T: Fishbone Analysis	4.4.1T: Problem Catalogue Template
4.2.4T: Graphic Representation	

Module 5: Action (Apply Meaning)

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5.1.2T: Logic Model Checklist	5.3.1T: Action Plan Template
5.2.1T: Crafting Meaningful Measures Checklist	5.3.2T: Action Plan Checklist

Module 6: Results (Look for Improvement)

6.1.1T: Evaluation Plan Template	6.2.2T: Building Data Walls
6.2.1T: Communication Organizer	6.2.3T: Evaluation Report Template

For more information on this and other district support resources, or to share feedback on these tools, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

![Massachusetts Department of Elementary & Secondary Education logo](logo)

District Data Team Self-Assessment 0.2.1T

MA ESE District Data Team Toolkit

District Data Team Self-Assessment

Background: This tool is designed to give a District Data Team an indication of its strengths and challenges in a variety of areas related to promoting a district-wide culture of inquiry and data use. The self-assessment is comprised of six short surveys which are aligned to each of the six modules in the Toolkit and to the six steps in the Data-Driven Inquiry and Action Cycle. Each survey has a number of selected-response questions grouped by Data Team practice. The possible responses are described in the rubric below.

1. Print each page of this self-assessment (including this page so that the rubric is readily available to anyone taking the survey) and provide a full copy to each member of the group.

2. Individually complete the survey, assigning a rating from the rubric below to each indicator.

3. As a group, discuss each page of the survey and agree on a rating for each indicator. It is not necessarily best to average the individual scores to get this final rating. If responses among individuals vary widely, engaging in a discussion about which rating best represents the level of practice can help the Team begin the hard work of developing a common understanding of the work.

4. Enter the final rating for each indicator into the spreadsheet version of this survey.

5. Print out the Graphs page (or use a projector to display it on the wall), and as a group talk through the discussion questions for each graphical display.

Rubric for Assessing Each Practice:

0	No Knowledge	Respondent/Team has no knowledge about this indicator and cannot provide a judgment about its existence in the district.
1	No Evidence	There is no evidence that this indicator is in place within the district.
2	Emerging Evidence	There is some evidence of this indicator in the district, but the evidence indicates that the practice is far from standard procedure and has clear room for improvement in both quality and frequency.
3	Adequate Evidence	This indicator has clear evidence of existence in the district and is consistently practiced in many places. There is room for improvement in either quality or frequency.
4	Exemplary Evidence	This indicator is evident in a variety of ways throughout the district. The practice described is clearly a part of the district culture and the way people operate within the district.

Interpreting the Data: When the Team completes the six surveys, the data will be displayed in a series of charts with questions to guide your review. There are two types of displays.
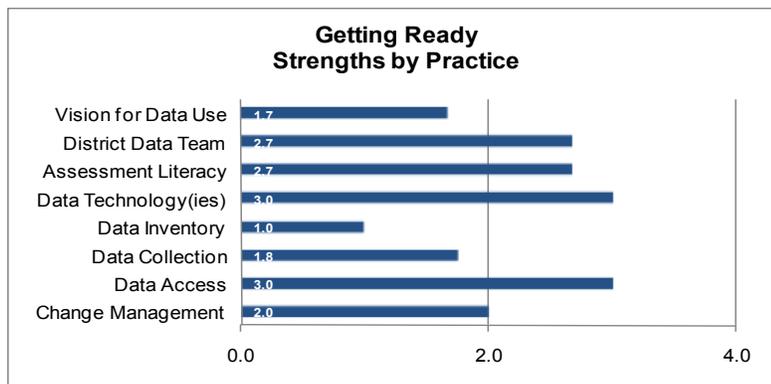
    * A **radar chart** showing your Team's perceptions of strengths across each of the six modules.
    * A **horizontal bar chart** for each step displaying the strengths within the step by practice.

A radar chart, also known as a spider chart or a star chart because of its appearance, plots the values of each category along a separate axis that starts in the center of the chart and ends on the outer ring. In the example below, each step of the Data-Driven Inquiry and Action Cycle is plotted on an axis. This makes it possible to compare your survey results across the steps. When your surveys are complete, your results will be displayed in a ring plotted on the chart. A district performing consistently across all of the steps will be displayed in a near circle. A district performing higher in some steps than others will be displayed in a more free form shape.

In the example below, this district is doing comparatively better in Inquiry, Information, and Knowledge than it is in the other three steps. In this case, the district might find value in starting with the Results module to get an idea of what processes are involved with monitoring action plans, and then shifting back to the Getting Ready module to strengthen its processes across the whole cycle.

Strengths by Steps

Getting Ready
4
3
2
1
0

Results

Inquiry

Action

Information

Knowledge

The horizontal bar charts will display your Team's perceptions of strength within each step. The questions in each step are grouped by practice. The chart displays the averages of the responses within each step, allowing you to view a disaggregated depiction of performance. When viewing these charts, you may find it valuable to go to the modules themselves to find the tools, resources, and activities that contribute to the effective implementation of that practice. Each of the practices surveyed in this instrument are supported in the modules.

**Getting Ready
Strengths by Practice**

Practice	Value
Vision for Data Use	1.7
District Data Team	2.7
Assessment Literacy	2.7
Data Technology(ies)	3.0
Data Inventory	1.0
Data Collection	1.8
Data Access	3.0
Change Management	2.0

0.0   2.0   4.0

Getting Ready

Incomplete

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Vision for Data Use   **Rating:**

The district has a vision for data use that aligns with and furthers the wider district mission and vision.	
The district's vision for data use is widely understood and accepted by all stakeholders.	
The vision is supported by district policies and published expectations that support the use of inquiry and data for instructional, school, and district improvement.	
Practice Average:	

District Data Team   **Rating:**

The district has an established District Data Team or has designated another team to fulfill those functions.	
The District Data Team has a data champion, a data manager, and additional members with the range of skills and perspectives needed to address the functions of the Team.	
The District Data Team has a clear sense of its purpose and role in furthering the district's vision for data use.	
The District Data Team has a written plan that outlines the membership, roles, and responsibilities of the Team, and this is publically communicated.	
The District Data Team uses effective team practices (starting and ending on time, appointing a moderator, following an agenda, appointing a note-taker, and clearly communicating regular meeting times).	
The District Data Team accomplishes its tasks effectively (action items are clearly noted with the people responsible and timelines for completion; Team communicates with all stakeholders).	
Practice Average:	

Assessment Literacy   **Rating:**

District Data Team members are fully fluent in and have a shared understanding of contemporary, standards-based assessment terms and concepts, e.g., summative assessments, formative assessments, performance levels.	
District Data Team members know what assessments are in use in the district and understand each assessment's purpose.	
Members of the District Data Team actively support the development of assessment literacy in district colleagues, school data teams, and others through professional development offerings, coaching, and modeling.	
Practice Average:	

Data Technology(ies)   **Rating:**

Resources, e.g., user manuals, job aids, IT support, for data technology(ies) exist and are easily accessible to district and school users.	
The district has technology(ies) for collecting and combining data from multiple sources, e.g., demographics, grades, assessment data, attendance.	
Practice Average:	

Data Inventory   **Rating:**

The district has a comprehensive inventory of demographic, assessment, and other data available to inform improvement plans and instructional practices.	
The data inventory is published and available to all, along with a regularly updated schedule to communicate how and when each type of data becomes available.	
Practice Average:	

Data Collection   **Rating:**

The District Data Team solicits feedback from stakeholders to identify opportunities for improvement in methods of data collection, management, and reporting.	
The District Data Team regularly uses established methods of communicating and coordinating with stakeholders at all levels regarding data work.	
Protocols or procedures are regularly used to ensure accuracy of data.	
The District Data Team collects and reviews data from non-electronic sources, such as *Learning Walkthroughs,* Common Planning Time (CPT) Self-Assessment, and interviews with principals and other staff.	
Practice Average:	

Data Access   **Rating:**

The district has clear policies for data access that conform to state and federal requirements.	
The District Data Team has knowledge of what data reports are disseminated to which stakeholders, when, why, and what actions are taken as a result.	
Practice Average:	

Change Management   **Rating:**

District Data Team members are able to identify and address potential resistance to change before problems occur.	
Practice Average:	

Getting Ready Composite Average:

Inquiry   *Incomplete*

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Question Formulation   **Rating:**

The District Data Team clearly articulates a focusing question to guide the inquiry process.	
When determining a focus for the inquiry process, the District Data Team considers high-level data and also solicits input from school and district leaders and other stakeholders regarding areas of priority concern, e.g., dropout rates, programs to evaluate.	
Practice Average:	

Data Displays

The IT staff and District Data Team create user-friendly data displays (charts, tables, and reports) that facilitate meaningful conversations and promote new insights on the work of the district in service of teaching and learning.	
Practice Average:	

Data Overviews   **Rating:**

The District Data Team creates effective data overviews (presentations to an audience) that are tied to identified questions.	
The District Data Team presents data overviews to appropriate audiences to introduce stakeholders to the inquiry process.	
Data overviews engage stakeholders in discussions of high-level data and solicit their input on the formation of the questions that will guide the inquiry process.	
Data overviews result in collaborative discussions about the meaning of the data, clarifying questions to focus the inquiry, and a list of data potentially needed to address the questions.	
Practice Average:	

Priority Identification   **Rating:**

The District Data Team prioritizes among identified areas of need arising from the inquiry process.	
The District Data Team examines new initiatives and priorities in the context of available resources and ongoing initiatives to ensure alignment.	
Practice Average:	

Inquiry Composite Average: | |

Information   *Incomplete*

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Data Collection Planning   **Rating:**

The District Data Team has a system to identify who will gather and organize data needed for analysis (related to the specific focusing and clarifying questions), by when, and from where.	
Practice Average:	

Data Analysis   **Rating:**

The District Data Team understands the differences between factual observations and inferences generated from analyzing data and is rigorous about distinguishing between the two when discussing evidence.	
Assessment data are analyzed in aggregate and disaggregate formats.	
Assessment data is triangulated with other data, e.g., attendance, benchmark assessments, demographics, data from *Learning Walkthroughs,* stakeholder surveys, or central office processes.	
Data analysis at the district level is conducted collaboratively within and among departmental teams.	
Data analysis results in the identification of specific problems or questions that need to be addressed, e.g., problems at the student level, classroom level, school level, or district level.	
Practice Average:	

Information Composite Average:

Knowledge *Incomplete*

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Root Cause Identification
Rating:

District Data Team members know and implement multiple protocols for the safe discussion of root causes.	
Root cause analysis helps the Team decide on the one potential factor that, if addressed, would eliminate or dramatically alleviate the problem.	
Practice Average:	

Connections to Research and Local Knowledge

Potential root causes and proposed solutions are investigated through the consultation of research to construct strong inferences about possible solutions/action steps.	
Potential root causes and proposed solutions are also investigated through the consultation of local knowledge or expertise to construct strong inferences about possible solutions/action steps.	
Potential root causes and proposed solutions are also investigated through the consultation of information on programs and practices (including data on instruction) to construct strong inferences about possible solutions/action steps.	
Practice Average:	

Shared Knowledge Base
Rating:

The District Data Team keeps and references a problem log or meeting records documenting questions raised to guide further inquiry.	
The District Data Team encourages collection, dissemination, and active use of one or more forms of documentation of lessons learned and promising practices from improvement efforts in a library of local knowledge.	
Practice Average:	

Knowledge Composite Average:

Action   *Incomplete*

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Action Planning   **Rating:**

The District Data Team uses a theory of action to focus action planning efforts.	
The District Data Team uses a defined process for action plan development.	
The action planning process considers ways to refine or reallocate existing resources, structures, and initiatives before proposing brand new ones.	
Action plans identify the available resources necessary to carry out the action steps.	
The district can justify to stakeholders how it uses resources to achieve desired outcomes.	
District personnel can articulate the district's program goals.	
District personnel can articulate their role in achieving program goals.	
Practice Average:	

Action Composite Average:

Results   *Incomplete*

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Evaluating Results

	Rating:
District personnel have had formal training in program evaluation.	
The district evaluates the efficacy and impact of programs based on student outcomes.	
The district uses a defined process to evaluate programs and initiatives.	
The district's evaluation plans include intermediate and long-term outcomes.	
The district consults its evaluation plans throughout the year.	
The district makes mid-course adjustments to the action plan as necessary, based on formative/progress data.	
The district typically achieves its program goals.	
Practice Average:	

Communicating Results

	Rating:
The District Data Team has a process and tools for communicating interim and summative results to stakeholders.	
The district uses the results of program evaluations to inform the development of new programs.	
The district has a process for codifying best practices at the district, school, or classroom level.	
The process for communicating results creates opportunities to solicit feedback to inform the development of new focusing questions.	
Practice Average:	

Results Composite Average: [　　　　　]

District Data Team Self-Assessment Results

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

Guiding Questions

What observations do you have as you view the data displays?

What patterns do you see in the data?

Are there any discrepancies you notice in the data?

What additional questions do you have based on the data?

What additional information do you gain when looking at the responses to indicators in the survey?

Strengths by Steps

Radar chart with axes: Getting Ready, Inquiry, Information, Knowledge, Action, Results. Scale markings: 0.0, 1.0, 2.0, 3.0, 4.0.

Notes:

Rating Scale: 0 = No Knowledge; 1 = No Evidence; 2 = Emerging Evidence; 3 = Adequate Evidence; 4 = Exemplary Evidence

**Getting Ready
Strengths by Practice**

Vision for Data Use
District Data Team
Assessment Literacy
Data Technology(ies)
Data Inventory
Data Collection
Data Access
Change Management

0.0   2.0

**Inquiry
Strengths by Practice**

Question Formulation

Data Displays

Data Overviews

Priority Identification

0.0   2.0

**Information
Strengths by Practice**

Data Collection Planning

Data Analysis

0.0   2.0

Notes:

**Knowledge
Strengths by Practice**

Root Cause Identification

Connections to Research and Local Knowledge

Shared Knowledge Base

0.0   2.0

**Action
Strengths by Practice**

Action Planning

0.0   2.0

**Results
Strengths by Practice**

Evaluating Results

Communicating Results

0.0   2.0

Notes

MODULE 1: GETTING READY

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MODULE 1: GETTING READY

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1.2.1T: Barriers to Effective Data Use

1.3.1T: Vision for Data Use

1.4.1T: Norm Setting Protocol

1.4.2T: Data Team Meeting Agenda

1.4.3T: Data Team Meeting Minutes

1.5.1T: Data Inventory Template

1.5.2T: Data Inventory Template: SIMS and EPIMS Data

1.5.3R: ESE Data Resources

1.6.1T: Data Collection Self-Assessment

1.7.1R: Data Dissemination Schedule Example

1.7.2T: Data Dissemination Schedule Template

1.7.3R: ESE Policies for Data Access

1.8.1T: Data Literacy Training Catalog

1.8.2R: Assessment Glossary

1.9.1T: Managing Change and Understanding Concerns Protocol

INTRODUCTION

WHERE ARE WE NOW?

The District Data Team Toolkit is based on the Data-Driven Inquiry and Action Cycle. The Cycle provides the structure that takes data use within the district from asking the right questions to getting results. It is an iterative process in which the district acts on data to support continuous learning and improvement. The Toolkit uses the steps of the Cycle to structure a progression through the model—you are now in *Module 1: Getting Ready*.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Getting Ready	Inquiry	Information	Knowledge	Action	Results

This module introduces district leaders to the purpose and role of a District Data Team in building a district-wide culture of data use. It provides guidance on how to establish a District Data Team and address some of the functions that will help the Team organize for success. By addressing these basic functions, the Team will then be able to engage in a meaningful data-driven inquiry process (outlined in modules 2–6).

MODULE OBJECTIVES

The **Getting Ready** module will help a district:

▶ Set the vision for data use across the district

▶ Build a culture of inquiry to promote systemic data use

▶ Establish a District Data Team to drive this work

▶ Build data literacy

▶ Understand types of data that inform inquiry

▶ Establish systems and policies to inventory, collect, and disseminate data

▶ Manage the change process

FUNCTIONS OF A DISTRICT DATA TEAM

WHAT IS A DISTRICT DATA TEAM?

A data team can generally be defined as a group of educators collaboratively using data to identify and understand opportunities for improvement, then working together to make changes that get measureable results. Using protocols for collaborative inquiry, the group follows a process in which members prepare, implement, and reflect on data-informed actionable goals.

This simple definition can be applied broadly at many levels within a district. At the classroom level, teachers use data to identify student learning problems and work together to plan instructional changes that will yield improvements in learning. At the school level, principals and school improvement teams use data to identify goals to drive improvements in the ways teachers collaborate and learn, thereby improving results for all students. Within a district office, many departments and leaders use data to make decisions regarding the management and efficiency of their particular responsibilities.
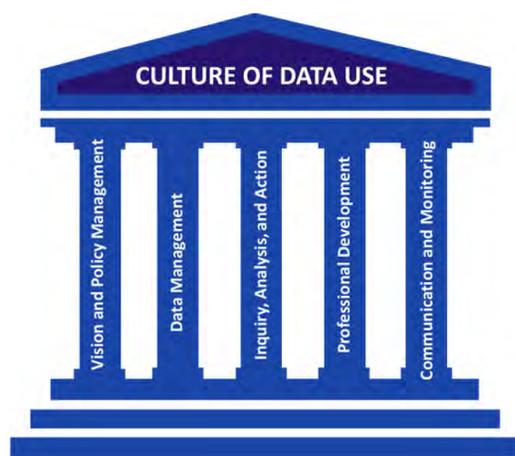
However, a District Data Team is one that has a unique position from all of the others. By definition, district leaders have unique perspectives on the operations of the district and correspondingly distinct responsibilities to make decisions that will have maximum benefit for the entire system. For these reasons, it is wise to establish a District Data Team that intentionally and strategically analyzes data from a wide variety of sources, triangulating and cross-referencing evidence as much as possible to gain new insight on the work taking place in service of teaching and learning. The Team can then use this new knowledge to make informed decisions, while also setting the course for inquiry and data use by all other teams in the district.

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In addition to conducting its own inquiries, a District Data Team is responsible for establishing the supports necessary for everyone throughout the district to create and sustain a culture of inquiry and data use. To do this, a District Data Team fulfills five essential functions.

Five Key Functions of a District Data Team	
Vision and Policy Management	Creating and articulating the vision, setting and modeling expectations, and implementing and upholding policies for data use in the district.
Data Management	Identifying data to be collected, managing data infrastructure and access, and designing meaningful data displays.
Inquiry, Analysis, and Action	Developing focusing questions and analyzing data to make district-wide decisions about curriculum, staffing, resources, and professional development.
Professional Development	Providing training and professional development to support district departments, principals, school data teams, and teachers to use data.
Communication and Monitoring	Communicating district-level focusing questions and findings throughout the district. Monitoring the school-level use of data, as well as goals and action plans to identify trends and patterns.

These functions are interconnected. In order to build a vibrant culture of inquiry and data use, a district must ensure that all functions are addressed. For example, an effort to establish high quality common planning time can be hampered by a lack of access to periodic assessment data. Conversely, the rollout of a data warehouse or other method for reporting data within a district can fall flat if the end users are not trained on how to access the information. However, it is better for a district to focus on building capacity in one area and do that well, rather than attempting to launch work in all five realms at once. Part of the work of a District Data Team is to determine the needs of the district and which function(s) should be the immediate priorities for the Team to address.

The majority of the guidance in this Toolkit focuses on supporting a District Data Team with Inquiry, Analysis, and Action and Communication and Monitoring. Some aspects of the Toolkit provide initial support for Vision and Policy Management and Data Management.

Activity 1.1 Functions of a District Data Team

This activity will help a district begin thinking about the role(s) the District Data Team will fill and who should serve on the Team.

(1.1.1T: Functions of a District Data Team)

BUILDING A CULTURE OF INQUIRY AND DATA USE

WHAT IS A CULTURE OF INQUIRY?

Developing a culture that uses data to make decisions is a difficult task. Simply providing data is not enough. Mandating meetings to analyze benchmark test results rarely causes the improvements we hoped to get by implementing the assessment in the first place.

To make the most of the data available within a district, there must be something more. In highly successful data use initiatives, there is a cultural shift that causes people to want to work differently, where teams of educators will meet regularly to analyze data, ask questions, and dig deeply to understand and fix problems. In all cases, there is a process that drives this kind of work and collaboration.

> **I**n highly successful data use initiatives, there is a cultural shift that causes people to want to work differently.

Having a culture of inquiry means having people within a district who are regularly asking questions about what all students should know and be able to do, how best to teach content and skills, and what student demonstrations will be acceptable ways to measure learning. The leadership that a District Data Team can provide is central to creating this district-wide culture of inquiry.

The modules in this Toolkit will help a district establish or enhance its District Data Team, as well as build the foundations to create a culture of inquiry and data use. One key to creating this culture is to understand what might be getting in the way of the district developing a thriving culture of inquiry and data use. Debra Ingram (2004)[1] and others uncovered seven barriers to the use of data to improve practice:

Cultural Barriers:

1. Many teachers have developed their own personal metric for judging the effectiveness of their teaching, and often this metric differs from the metrics of external parties, e.g., state accountability systems and school boards.

2. Many teachers and administrators base their decisions on experience, intuition, and anecdotal information (professional judgment), rather than on information that is collected systematically.

3. There is little agreement among stakeholders about which student outcomes are most important and what kinds of data are meaningful.

Technical Barriers:

4. Some teachers disassociate their own performance and that of students, which leads them to overlook useful data.

5. Data that teachers want about ―really important outcomes" are rarely available and usually hard to measure.

6. Schools rarely provide the time needed to collect and analyze data.

Political Barriers:

7. Data have often been used politically, leading to mistrust of data and data avoidance.

Understanding which of these barriers is most salient in the district can help the Team strategize on the best way to engage more stakeholders. However, the Team must also consider whether these are actual barriers, or symptoms of something else. The section on *Managing the Change Process* provides additional guidance for engaging stakeholders in an initiative to increase use of inquiry and data in the system.

Activity 1.2 Barriers to Effective Data Use

Use this activity to begin thinking about the challenges the Team will address to improve data use in the district.

(1.2.1T: Barriers to Effective Data Use)

A VISION FOR DATA USE

In order for a district to shift from being an efficient generator and collector of data to an organization that translates data into information to guide improvement, a broad effort and a clear, shared vision are required. A shared vision sets a common goal and direction for the work of all involved. A vision that specifically addresses data use in the district can serve to connect the various functions that a District Data Team fills, as well as connect the Team to other district efforts, so they don't stand as silos, but rather work together as pillars to sustain a culture of inquiry and data use. Without a clear vision for inquiry and data use that is broadly understood throughout the district, the related supports and tools may still be viewed as disconnected from other district initiatives, and from important work at the school and classroom levels.

> **W**ithout a clear vision for inquiry and data use that is broadly understood throughout the district, the related supports and tools may still be viewed as disconnected from other district initiatives, and from important work at the school and classroom levels.

A vision statement is one that takes into account the mission of the district and describes how things will look in the future if the Team's work is successful. Hallmarks of a clear and vibrant vision[2] include:

- The vision is reflected in the district's strategy and corresponding use of resources

- Everyone in the system gives the same responses to important questions, like ―why is data use important to teaching and learning?"

- Stakeholders demonstrate shared belief, collective clarity, ownership, and energy for the work at hand

- People are inspired to look beyond quick fixes and dig into real challenges

- People are able to look beyond smaller challenges and focus on what is really important

The district likely has a mission statement that answers the question, ―Why do we exist?" and serves as a clear statement of purpose for everyone in the district. At its core, the statement puts a stake in the ground and declares why you exist—to educate children.

A district vision statement for data use should derive from the district's overarching mission and vision. It will have a slightly different tone that focuses on data use, while still connecting in some way to improving performance, taking action, or doing things differently than they have been done in the past. The vision statement should define the future so it can serve as a guidepost for all data use efforts.

If there are people anywhere in the district who aren't sure of what data are available, what actions data should inform, or why certain data are even collected, this may be a sign that the district lacks a clear and shared vision for data use. Consider for a moment the data use in your own district.

- How prepared are principals to use inquiry and data to inform their own work?

- How prepared are principals to lead their staff and teachers in inquiry and data use? To what extent do they actually do this?

- How prepared are staff and teachers to use inquiry and data to inform their work? To what extent are they actually engaged in data use?

- To what extent can principals, teachers, and others in the district articulate how data inform their practice and further the district's mission for educating its students?

Activity 1.3 Vision for Data Use

Open the *Vision for Data Use* document and complete the activities to either assess the district's existing vision for data use, or craft a new one.

(1.3.1T: Vision for Data Use)

ESTABLISHING A DISTRICT DATA TEAM

DATA TEAM COMPOSITION

In conducting the work to this point, several people have probably contributed who will serve as members of the District Data Team in a sustained capacity. Now that the functions of the Team are understood and there is a strong vision for data use across the district, it is time to formalize the Team into a functioning entity.

Using the results of 1.*1.1T: Functions of a District Data Team* and 1.*3.1T: Vision for Data Use* as a guide, identify the departments and people who will be essential in helping the District Data Team fulfill all five key functions necessary to support data use in the district, which were previously noted in this module.

Depending on the size and composition of the district departments, you may need to involve people from several different departments. Finding the right people to fill each post on the Team may be challenging if they have not participated in the process to this point. As potential members or department heads who have not participated previously are communicated with, consider sharing the District Data Team's vision statement to help them understand the importance of their participation.

When assembling a District Data Team, it is important to think strategically about who will be on the team and why. The following questions provide some guidance:

- What are the perspectives and expertise needed to fulfill the District Data Team's vision and priority functions?

- Who is familiar with and/or supportive of using inquiry and data to inform decisions?

- Who has solid skills in analyzing and explaining data?

- Who has credibility with stakeholders and can champion inquiry and data use with others?

- Whose participation would help the Team address current barriers to effective data use? (Note that this could lead the Team to include individuals who might be hesitant or resistant to processes of inquiry and data use, not just those who are already on board)

- Who thinks creatively and can share a fresh out-of-the-box perspective on both analysis and action planning?

- Who has a solid understanding of programs, initiatives, and other efforts taking place across the district?

- Who has a deep commitment to improving the learning of all students and the practice of all adults involved in educating them?

- Who understands the concepts of team, consensus, and unified messages?

- Who is likely to be able to commit time and energy to a multi-year effort to establish and maintain a district-wide culture of inquiry?

The most effective District Data Teams have members who want to support the inquiry process through the use of data and are broadly representative from a district perspective.

The District Data Team must be led by a **data champion**. This individual should have the positional authority and credibility to ensure:

- The District Data Team has the resources and supports necessary to function effectively

- The work of the District Data Team is understood and visible to others in the district

- The work of the Team will be acted upon

The Team must also have a **data manager** who is in charge of the more technical aspects of the work, such as:

- Coordinating data use throughout the district

- Establishing systems to ensure the cleanliness and quality of the data

- Integrating different data systems

- Ensuring all users are using the same data dictionary and terminology

It is also critical that the superintendent shows support for the inquiry process and the work of the District Data Team by modeling data use and visibly responding to the needs of the Team.

Core Data Team members will be determined within the context of the local setting, but could include:

- Data champion (chairperson)

> **T**he most effective District Data Teams have members who want to support the inquiry process through the use of data and are broadly representative from a district perspective.

- District-level data manager

- Director of pupil personnel services/special populations

- Assistant superintendent for instruction

- Director of assessment, research, and evaluation

- Directors of elementary and secondary education

- Literacy and mathematics coaches

- Special projects coordinators, e.g., SLCs

- Principals, lead teachers, or other school-based faculty

While broad representation is important, it is also essential that the Team not be too large. One approach is to form a core Data Team of six to eight members who will do most of the collection, analysis, dissemination, and coordination work, and establish a more broadly representative group of adjunct Data Team members who will provide input in specific areas and general feedback to the core group.

The **Adjunct Data Team** members could include:

- Subject-area directors

- School-level data team chairs

- Principals

- Grants director

- Union leadership

- School board member

- Parent association representative

- Teachers and other school-based faculty

Remember to provide administrative support for the Team's work, which might include taking notes at Team meetings, producing materials, and generating specific data displays.

LAUNCHING THE DISTRICT DATA TEAM

Prior to beginning the district-wide inquiry process, the District Data Team must get organized and begin to build its capacity to drive inquiry throughout the district. Some initial steps many districts have found useful are noted here.

1. **Obtain** clearly stated and visible support from the superintendent–in both written and oral communications.

2. **Meet** with district administrators to clarify the purpose of the initiative, how it relates to the district's mission and goals, the role of the Data Team, and the Team's decision making authority.

3. **Establish** clear relationships and lines of communication among the Data Team and other teams at the district and building levels, e.g., district leadership team, school improvement teams, departmental teams, grade-level teams, or professional development teams.

4. **Organize** itself to do the work by:

   - Agreeing to always set an agenda for Team meetings that clearly delineates intended outcomes or products expected as a result of the meeting

   - Establishing group norms and using protocols to structure conversations

   - Understanding that there will be a learning curve for the Team and that the Team shouldn't address too many essential questions at the outset

   - Agreeing to delegate tasks and expect timely completion

   - Expecting members to work between meetings to complete tasks

5. **Build** the District Data Team's capacity before building the capacity of the school-level data teams and the district-level staff. The District Data Team should:

   - Continue to build shared values and refine a common vision for the inquiry process and data use at the district and school levels

   - Participate in ongoing professional development activities to build its capacity to use data and function constructively as a team

6. **Provide** adequate time for the Team to understand, develop, and complete its work. Time is the dearest resource in a school or district, and insufficient time will sorely limit the Team's effectiveness.

- Data Team members need enough time to share information, generate understanding, and determine next steps

- Data Teams need uninterrupted, protected time for collaboration, in addition to time for capacity building, professional development, and collaboration with the school-level data teams (more time will be necessary during the launching phase than in subsequent phases)

Activity 1.4 Data Team Meetings

The *Norm Setting Protocol* will help the Team articulate and agree on ways of working together in order to foster risk-tasking and effective communication during tricky conversations. The templates provide models for agendas and capturing meeting minutes, in order to assure productivity and high-quality communication during and after meetings.

(1.4.1T: Norm Setting Protocol)
(1.4.2T: Data Team Meeting Agenda)
(1.4.3T: Data Team Meeting Minutes)

TAKING STOCK

TAKING STOCK OF CURRENT DATA AND PROCESSES

Before a newly established District Data Team dives into a process of inquiry, it should first take stock of a few key elements related to data use in the district. Given the Team's functions of data management and professional development in particular, it should consider what is being done to promote data literacy district-wide, as well as document what data are available to whom and when.

TYPES OF DATA THAT INFORM INQUIRY

Often when people think of data, they think of numbers, and particularly student assessment data. However, data refer to a much wider range of evidence and include any factual information (as measurements or statistics) used as a basis for reasoning, discussion, or calculation.[3]

Any data team, but a District Data Team in particular, has a responsibility to consider data from multiple sources in order to gain an understanding of the quality of work being done in service of teaching and learning—not only in the classrooms, but in all areas of the district. The Team can increase the validity of its inferences and conclusions if it taps a variety of data sources to provide more information about the question being investigated. This may involve comparing different forms of the same type of data, such as results from different types of assessments. Alternately, the Team may compare two entirely different types of data, such as comparing achievement to the length of time a student has been enrolled in the district, or the length of time the student spends travelling to school.

The graphic below, based on the work of Victoria Bernhardt[4], outlines four primary domains of data: student outcomes, demographics, perceptions, and school (or district) processes. This lens highlights the fact that student achievement data provide only one view on the work of a district. The Data Team must also analyze data related to processes such as hiring, procurement, and even facilities maintenance, or perceptions of stakeholders, in order to gain new insight on the supports needed from the district to take teaching and learning to the next level. This may mean looking for data in forms other than numbers that can be easily counted,

> **F**our important types of data:
>
> Student Outcomes
> Demographics
> Perceptions
> Processes

and also considering data generated by what one sees (such as through *Learning Walkthrough* site visits) or hears (such as through stakeholder surveys and focus groups).

This diagram also describes the interaction of data from the four primary domains and the kinds of inferences that can be drawn from the intersections.
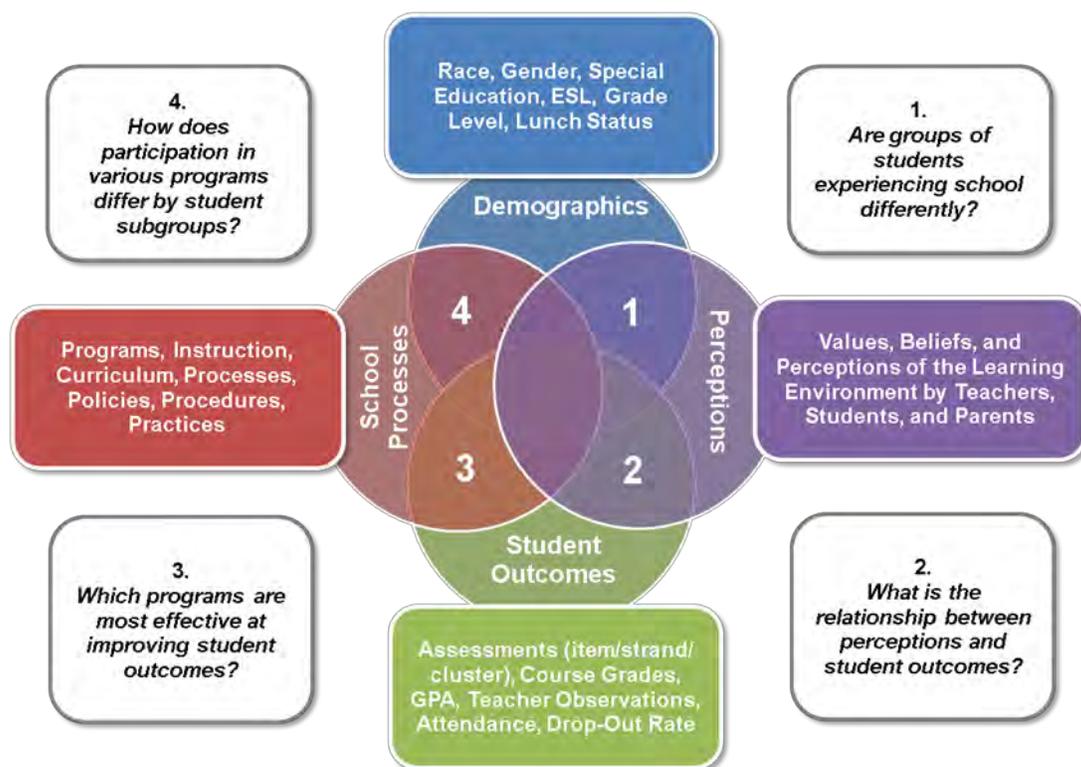
Adapted from: Bernhardt, V. L. (2004). *Data Analysis for Continuous School Improvement.* Larchmont: Eye on Education

It is important to note that of these four domains, only one can be directly modified by a District Data Team (or anyone else, for that matter), and that is processes. It is only by changing the way adults interact and conduct business that a district can hope to shift the evidence it sees in the realms of demographics, perceptions, and student outcomes.

DATA INVENTORY

With this lens of the four domains, the District Data Team can inventory the data available in the district, when they are available, how readily they can be accessed by the Team for consideration in the inquiry process, and how they are being used in service of teaching and learning. Completing this inventory serves multiple functions. It can help a district:

- Gain a clearer picture of the data currently available to guide inquiry at all levels in the district, and how they are being used

- Identify data that are being collected, but that are not necessarily well-used

- Identify redundancies in data collection that could be eliminated

- Identify additional data elements needed to address district and school improvement and inquiry processes

- Communicate expectations for what to do with particular data

The data inventory provides a framework to collect both district-wide and school-based data. School-based data are not necessarily collected in other schools in the district. These data, such as those generated through use of a commercial off-the-shelf assessment or screening tool, or a school-designed survey for families, can provide some value to district inquiry processes since they can shed light on how a particular school functions. Yet school-based data also have their limitations, most significantly that they do not enable ―apples to apples‖ comparisons to other schools.

In promoting a district-wide culture of inquiry and data use, a district should consider the benefit of promoting and analyzing common district-wide data. For example, student assessment data are only useful for district-wide inquiry and analysis if they represent every student across the district in the same relative time span. Examples of common assessments include:

- Statewide tests such as MCAS or MELA-O

- Commercial benchmark assessments or screening tools that are used with all students in a particular population district-wide

- Locally developed assessments such as common mid-terms and finals created by district personnel

Other forms of common district-wide data include:

- District financial statements

> **T**he data inventory provides a framework to collect both district-wide and school-based data.

- Human resources tracking systems

- Student transportation information

Common district-wide data allow the Team to examine a snapshot of a given population at a given time, and also help get various stakeholders talking in the same language.

A data inventory, coupled with expectations for what to do with particular data, can help the district establish standard procedures or processes for what to do with certain data like a benchmark assessment. For this reason, the district might consider sharing this inventory widely with school leaders, teachers, and other stakeholders, as well as referencing it for its own use. The district might also consider having each school complete the inventory, then compare the results across schools. For example, the district may learn that some schools are using a particular assessment that the district would want to expand. Or the district might notice a pattern between the types of assessments used at a school and the achievement results of its students.

Activity 1.5 Conducting a Data Inventory

This activity will help determine current availability and use of data and will identify additional data elements needed to further the inquiry process. *1.5.2T: Data Inventory Template: SIMS and EPIMS Data* is pre-populated with information on these state-wide data elements. *1.5.3R: ESE Data Resources* may be useful to reference for information on this and data the state provides for districts.

(1.5.1T: Data Inventory Template)
(1.5.2T: Data Inventory Template: SIMS and EPIMS Data)
(1.5.3R: ESE Data Resources)

DATA COLLECTION

For the available data to further the inquiry process, they must be complete, accurate, and timely. Collection and distribution tools and processes need to be efficient and effective to ensure that these criteria are met.

Data collection is people-centered. In order to have complete and accurate information provided in a timely manner, it is essential that the people who are responsible for data collection are well trained and well supported. Successful data collection occurs when those responsible for collecting data:

- Understand and are invested in what the data will be used for

- Understand how the data they collect will be integrated into other systems

- Participate in the creation of and agree to the use of a common Data Collection Practices handbook

- Are adequately trained to complete the task

- Have appropriate tools to support the collection process

- Work in an environment free from distraction

- Are provided the time to collect the data and ensure the data's integrity

Without this support, it is highly likely that the district will not get valid information, which in turn would detract from its ability to make quality evidence-based decisions.

The District Data Team can contribute to the effective collection and distribution of data by continually monitoring the needs of the district; the effectiveness of the tools in place for data collection, storage, and dissemination; and the training of those who are responsible for data collection and input. One of the most important things that members of the Team can do is listen and respond to the needs of the staff in charge of the data collection process.

Activity 1.6 Data Collection Self-Assessment

This activity will assist you in describing the tools and systems in place for the collection, storage, and dissemination of data, and in evaluating the effectiveness of these tools and systems.

(1.6.1T: Data Collection Self-Assessment)

DATA DISSEMINATION AND ACCESS

Collecting complete and accurate data in a timely manner means little if the data are not disseminated for use by stakeholders. It is important for all members of the district community to know what data are available, which data will be disseminated to whom, how the data are to be used, and when the data will be refreshed, e.g., a new set of data produced. Now that the District Data Team has a firm understanding of those factors, the Team can publish this information through a data dissemination schedule.

However, the Team must also pay close attention to who is given access to what data, and why. Federal, state, and local regulations determine who can have access to personally identifiable data. The Massachusetts Department of Elementary and Secondary Education has published guidelines regarding access to data that comply with these regulations. Each district also has privacy policies to inform decisions regarding access to data. Specific access guidelines have been developed by the ESE for the ESE Education Data Warehouse. These guidelines can serve as a model for the development or critique of locally developed guidelines for data access.

Beyond compliance with federal, state, and local data access regulations, the District Data Team must consider the logistics involved in providing appropriate data in a user-friendly and timely manner to those who need it. Faithful use of the data dissemination schedule will ensure that a large segment of the community will be provided with the data that it needs. Some may have access to data through the student information system, while others will gain access through use of the ESE Education Data Warehouse. It is important for the District Data Team to be sensitive to the data needs of the district as a culture of systemic data use evolves, and to act to meet those needs.

Activity 1.7 Data Dissemination and Access

The data dissemination activity can help a District Data Team construct and publish a schedule for the distribution and use of major data elements.

(1.7.1R: Data Dissemination Schedule Example)
(1.7.2T: Data Dissemination Schedule Template)
(1.7.3R: ESE Policies for Data Access)

DATA LITERACY

To effectively use the data available to them, principals, teachers, district-level staff, and the community need certain knowledge and skills. It is particularly important that the members of the District Data Team have competencies in data and assessment literacy. Additionally, each of these stakeholders needs to develop a shared understanding of the purposes and uses of various data as they pertain to their roles in serving students. Stakeholders must understand what data to use when, the uses and limits of specific assessments, ways to interpret and use the various reports produced by those assessments, and specific statistical terminology and calculations used in those reports. A successful District Data Team will

take time to ensure that its members have a degree of assessment literacy that sets them up for success not only in their own inquiry processes, but also as they begin to model inquiry and data use for others.

For each standardized assessment used in the district, there are unique details about test and item construction that must be communicated to and understood by all consumers of the test. This includes teachers, principals, and other staff as they analyze results in preparation to take action, as well as parents and students as they receive reports designed to inform them of specific areas of strength, challenge, and progress toward attaining proficiency in core curriculum standards.

Methods by which each of these consumers will gain this specialized knowledge need to be well planned and implemented to ensure that the data are used properly and safely in service of students.

The following tools and sources of information can be helpful in planning ways to improve the level of data literacy in a District Data Team, as well as across the district.

Activity 1.8 Assessment Literacy

These resources will help a District Data Team develop its assessment literacy, as well as that of other stakeholders in the district.

(1.8.1T: Data Literacy Training Catalog)
(1.8.2R: Assessment Glossary)

MANAGING THE CHANGE PROCESS

WHY IS CHANGE MANAGEMENT NECESSARY?

> **T**he challenge is to both *implement* the change while also *managing* the change process.

An earlier section in this module provided guidance to reflect on a district's barriers to the effective use of data to improve practice. These barriers are often symptoms of something else. Richard Sagor (1992)[5] suggests that some resistance may stem from the fact that teachers are, for the most part, already doing what they believe is best for their students. Teachers and other district personnel may be slow to adopt a new initiative because they cannot see how it would benefit their students or others for whom they are responsible. They may also feel a sense of loss—for example, of competence—if they are asked to approach their work differently than they have for the last 5, 10, or 20 years.

When presenting a new initiative designed to develop or enhance a culture of inquiry and the use of data to inform educational decision making, the District Data Team and others who are supporting the initiative must be prepared to manage the stress and push back that will naturally occur.

The challenge is to both implement the change while also managing the change process. When introducing or enhancing a cultural norm of a truly collaborative learning community—one where all members regularly ask questions about their practice and what more can be done in service of student learning and achievement—the Team must pay attention to the human element, the students and adults who are being asked to approach work differently in order to achieve new outcomes.

WHAT CAN A DISTRICT DATA TEAM DO?

To effectively meet the challenge posed by the change process, the District Data Team must acknowledge that resistance is a natural process and that the District Data Team and others have the power and responsibility to mitigate the negative impact this phenomenon can produce.

A District Data Team can use the following framework as a guide when introducing the inquiry process district-wide. The guidelines suggest steps that the Team can follow to support school-level data teams and other teams within the district as it initiates the first steps in the collaborative Data-Driven Inquiry and Action Cycle.

Build Awareness

- Build a vision for data use that is grounded in positive student outcomes

- Articulate the vision for district-wide systemic data use clearly and repeatedly with all stakeholders to paint an evident image of how the future will be better if all engage in this work

- Develop and communicate a sense of positive urgency

- Share the structure and function of the District Data Team with school-level teams

Understand Concerns

- Talk openly with staff at all levels in the district about stress they may experience as change is implemented

- Actively listen: solicit and act upon the concerns of staff members to facilitate the change process

- Acknowledge losses that people may feel as they shift established habits and approach their work in new ways

Model the Process

- Lead by example, not by edict

- Publicly demonstrate how the District Data Team is moving toward the vision

- Present the district-level data overview with school-level participants and other district stakeholders

- Design district-level action plans using the Data-Driven Inquiry and Action Cycle

Manage the Process

- Conduct and maintain a data inventory (*2.2.1T*) that includes school-level data

- Coordinate the upload of local data to the ESE Data Warehouse

- Maintain an up-to-date data dissemination schedule (*3.2.2T*)

- Disseminate relevant data sets and displays for school-based action

Monitor the Process

- Coordinate district- and school-level focusing questions

- Provide feedback to school-level teams on the effectiveness of the data displays that they construct

- Work with all teams within the district to support the monitoring of their action plans

Build Capacity

- Develop a broad base of support among all stakeholders

- Lead a discussion of how the vision can be realized through the action of school-level teams

- Involve staff in collaborative and objective analysis of data to answer the high-interest questions that they have developed

- Help schools and district offices form data teams

- Provide support to school-level teams as they utilize the resources of the Toolkit

- Provide professional development to help district personnel build assessment literacy and use relevant data warehouses

- Assist schools as they learn to prepare local data for upload to centralized data warehouses

- Provide professional development activities to build assessment literacy

Celebrate Success

- Positively reinforce movement toward desired goals for a culture of inquiry and data use as well as improved student achievement

Over time, with patience, perseverance, and strategic action, the District Data Team can help the district as a whole establish and/or enhance a cultural norm in which inquiry and data use is a regular part of everyone's work, where data are regarded as impartial evidence that can spark a question, trigger an idea, or measure a result.

Activity 1.9 Managing and Understanding Change

This protocol can help a District Data Team gain a better understanding about the concerns of stakeholders as it engages in this work.

(1.9.1T: Managing Change and Understanding Concerns Protocol)

MODULE SUMMARY

This module explores the roles and functions of a District Data Team to set the course for data use in the district and support the establishment of a culture of inquiry. It discusses the value of a vision statement for data use and provides guidance on how to create or refine one. Setting and communicating the vision for how the district will use data to make decisions is key to success with the inquiry process outlined in the remainder of the Toolkit's modules.

The module also addresses data management activities that provide a foundation for a culture of inquiry and data use, such as tracking the data that are being collected in the district, who is using the data and how.

Any new initiative or way of approaching the work of teaching and learning will likely take some time to gain traction. Taking some time to consider how the district will manage the change process and address the uncertainties felt by stakeholders can go a long way toward promoting the success of the District Data Team's efforts.

If you have not yet done so, consider administering the *District Data Team Self-Assessment* at this time (*0.2.1T*). It will help the Team identify its strengths and challenges related to an inquiry process, providing guidance on how to use the remaining resources in the Toolkit.

REFERENCES

[1] Ingram, D. S. (2004). Accountability policies and teacher decision making: Barriers to the use of data to improve practice. *Teachers College Record, 106*(6), 1258–1287.

[2] Curtis, R. E. and E. A. City. (2009). *Vision: Keeping the end in mind*. Chapter 4 in *Strategy in Action*. Cambridge, MA: Harvard Education Press.

[3] http://www.merriam-webster.com/dictionary/data (December 24, 2009)

[4] Bernhardt, V. L. (2004). *Data Analysis for Continuous School Improvement.* Larchmont: Eye on Education.

[5] Sagor, R. (1992). *How to conduct collaborative action research.* Alexandria, VA: Association for Supervision and Curriculum Development (ASCD).

*For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.*

FUNCTIONS OF A DISTRICT DATA TEAM 1.1.1T

Purpose	To understand the role and functions your District Data Team fulfills to support a culture of data use.
Description	Team members will review the functions of a District Data Team and think specifically about how these tasks are accomplished within its district. The Team will also identify gaps that might exist on the Team and begin thinking about how to address them.
Time	45 minutes to an hour.

Related Documents
1–Getting Ready Module
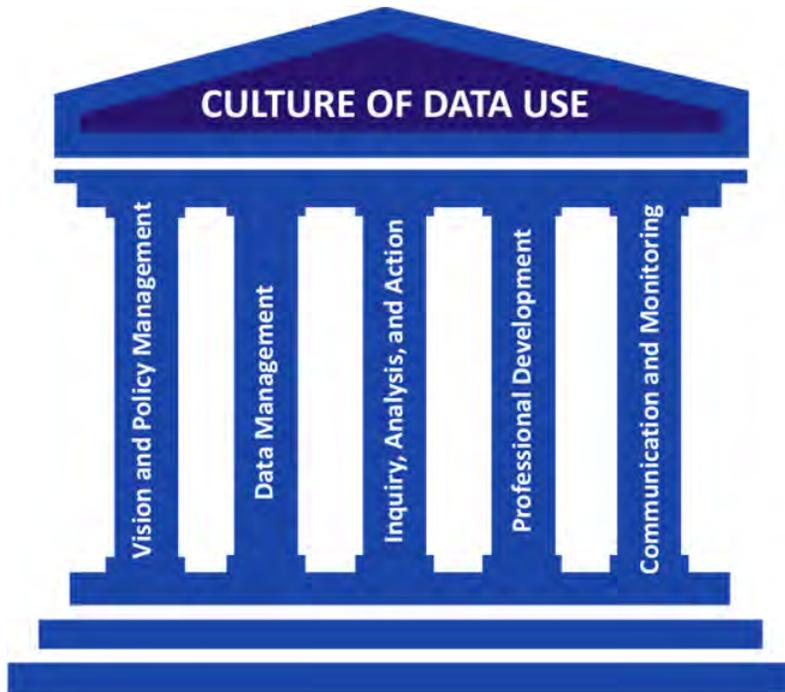
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"A District Data Team is responsible for establishing the supports necessary for everyone throughout the district to create and sustain a culture of inquiry and data use. To do this, a District Data Team fulfills five essential functions."

—Module 1: Getting Ready

FUNCTIONS OF OUR DATA TEAM

STEP 1) Use the table below to brainstorm the specific tasks already being performed in the district within each function. Allow individual think/work time before sharing and charting everyone's ideas. (See *Module 1: Getting Ready* for explanations of the five functions)

Vision and Policy Management	Data Management	Inquiry, Analysis, and Action	Professional Development	Communication and Monitoring

FUNCTIONS OF OUR DATA TEAM

STEP 2) Reflect on the results of the brainstorm by discussing the following questions. It may be useful to have for reference the results of the District Data Team Self-Assessment.

1) In which functional area(s) is the district performing particularly well? What is the evidence?

2) Which function is currently the district's biggest challenge? What is the evidence? What is getting in the way of success in those areas?

3) What key tasks, if any, are missing from the list of tasks currently being performed?

4) What tasks are the greatest priority for the coming year, given the district's strategic priorities and improvement plan?

5) Which of these tasks are dependent on cross-departmental cooperation? (Note which departments).

6) Which tasks are currently being performed exclusively within one department? (Note which departments).

7) If the District Data Team is going to fill all of these key tasks and functions, whom does the Team need to have as members? (Identify by name and/or role).

BARRIERS TO EFFECTIVE DATA USE   1.2.1T

Purpose	To identify barriers or problems your Team might face regarding data use.
Description	The District Data Team will make a list of possible barriers or problems that might slow its progress. You will also begin to think about solutions to them.
Time	30 minutes.

Related Documents
1–Getting Ready Module

As a team, brainstorm a list of the barriers the district currently faces in creating and/or maintaining a culture of inquiry that is embedded in everyone's work. Try to identify a range that includes cultural, technical, and political barriers. As a team, identify which barriers are the most significant and that, if addressed, would result in the greatest shift toward an embedded culture of inquiry. For each of these prioritized barriers, identify possible strategies and people who can help address these barriers. Try to think out of the box in identifying these people, looking beyond titles and positions. Keep this list accessible as the Team works through this module and the rest of the Toolkit. These barriers will become areas of focus for the District Data Team.

Barrier	Cultural, Technical, or Political?	Possible Strategy to Address	People to Involve in the Solution

VISION FOR DATA USE   1.3.1T

Purpose	To develop a shared vision for data use that will guide the District Data Team's work.
Description	Team members will develop a shared vision for data use in the district and craft a vision statement to drive the Team's work.
Time	About 2 hours. (Can be done in two blocks).

Related Documents
1–Getting Ready Module

If the district already has a vision statement that incorporates data use, locate it and use this guide to assess and revise it if necessary. If there is no reference to data use in the existing district vision, use this guide to draft a vision statement to guide the work of the Team.

If the Team has completed *1.2.1T: Barriers to Effective Data Use*, it may want to have those notes available for reference.

FINDING A SHARED HORIZON

A vision statement looks to the future and defines how things will be improved over their current status. Some vision statements have a fairly long view (for instance, 3–5 years in the future), and some seek to define changes that will be in place in less than a year.

1. Let the Team know that the purpose of the activity is to begin to articulate a vision for the work of the Team. The actual writing of the vision statement will come later.

2. Provide each person on the Team with a large note card or sticky note and instruct them to individually write a vision for data use in the district. Guide them by asking a specific question such as:
   - If this team were to be successful in promoting data use, what would that look like?
   - What do we want the future of data use in the district to look like?

   You might also ask members to consider:
   - The data use practices needed to fulfill the district's mission
   - The functions of a District Data Team identified in *1.1.1T*
   - The barriers to effective data use identified in *1.2.1T*
   - What things would look like if an important problem were resolved

   Provide about 5 minutes of silent work time and let them know that responses will be shared.

3. Once everyone has had a chance to write his or her vision statement, let the group know that the next step is to work together to sort the notes in relative order, so that the most immediate aspirations come early (Vision 1 or 2), while the longer-term aspirations are near the end of the horizon line (Vision 3 or 4).

   In preparation for this, each individual should review what he or she wrote and write each separate thought onto a different card or sticky note.

4. Draw a diagram similar to the one below on chart paper or a white board, or label sections on a wall.

Vision 4

Vision 3
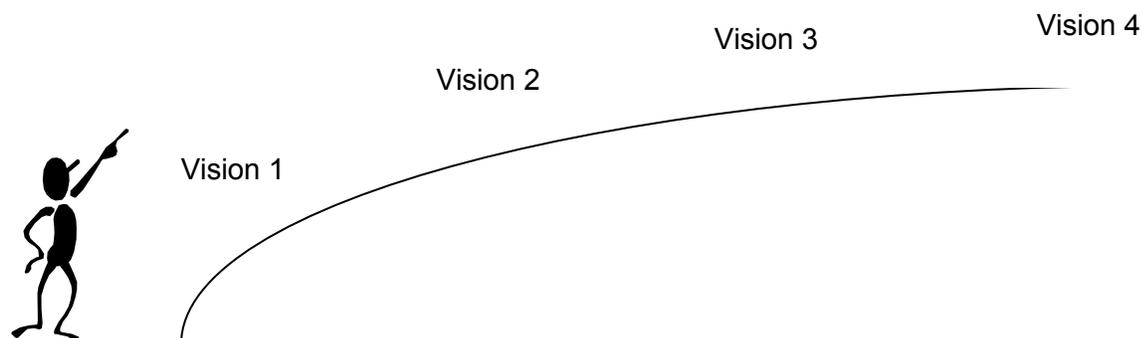
Vision 2

Vision 1

The curved line represents the future, while under the person's feet is current reality.

5. Once all Team members have completed visions and separated statements onto separate cards (if necessary), they attach their note to the diagram.

6. Review all the statements, discuss and arrange the notes until all members of the Team are satisfied with the order.

7. As a Team, review the assembled statements and add any key ideas that seem to be missing. Also ask if anyone has any questions or concerns about any of the ideas, and whether anyone would have a hard time getting 'on board' with them.

The Team now has a view of a shared strategic focus. The diagram outlines priority areas of need to be addressed by the District Data Team and is beginning to paint a picture for data use in the district.

If the district has a vision for data use already written, compare it to the array of ideas the Team has just created. Determine if the existing vision is in alignment with the shared strategic focus the Team just developed. If there is not alignment, consider whether it is the existing vision or the Team's strategic focus that may need revision.

Note: This process can be modified for use in other settings, such as crafting or revising a district's vision for education. The key is to articulate a clear guiding question to focus the initial work in step 1.

CRAFTING A VISION STATEMENT

If the district does not have an existing data use vision statement, follow the steps below to craft a vision statement.

1. On a new piece of chart paper, write the following sentence starter:

   In ___ years, our district will accomplish _____ by doing _____.

2. Ask each member of the Team to write a statement that incorporates the Team's shared strategic focus using the sentence starter as a guide.

3. Record each person's draft vision statement on chart paper (or an electronic document displayed with a projector).

4. Review the statements as a Team. Look for opportunities to combine similar ideas and identify unique ideas.

5. Merge all of the ideas into a clear statement of the district's vision for data use. The statement may be multifaceted or bulleted, but it should include the essential elements of the original sentence starter.
   a. A timeframe
   b. Accomplishments or goal statements
   c. Methods or strategies that will be used to achieve the vision

6. Refine the statement until all members of the Team are satisfied that it captures the Team's priorities and vision for data use in the district.

7. Consider the authority with which the District Data Team has been charged. Does the vision need to be approved by another team? How will this vision be finalized and communicated to district leadership, schools, and other stakeholders?

NORM SETTING PROTOCOL 1.4.1T

Purpose	Tools for launching or supporting the work of a District Data Team.
Description	This protocol will establish the norms under which the District Data Team will operate. Setting norms helps keep unproductive behaviors in check while fostering risk-taking and effective communication during tricky conversations.
Time	15–30 minutes.

Related Documents
1–Getting Ready Module
1.4.2T: Data Team
Meeting Agenda
1.4.3T: Data Team
Meeting Minutes

3–5 minutes

Invite people to reflect in writing on the response to this question **"In order to reach our vision, what norms will we need?"** Explain that norms are guidelines for an interaction or meeting, and can include both process (e.g., start and end on time) and content (e.g., taking risks with our questions and ideas).

5–10 minutes

Invite people to share norms. It's sometimes best to do this round-robin style so that you hear one from each person, and then open it up for other ideas. **Record the norms on chart paper or using a computer and projector**. You don't need to write these exactly as stated—just capture the idea.

10–20 minutes

Ask if there are any norms people have a question about (sometimes people will ask a clarifying question about what something means) **or couldn't live with** during future meetings. You may need to rephrase or reframe norms to pose them in a way that everyone is comfortable with. **When everyone seems clear and comfortable with the list, ask if there is anyone who can't live with and support these norms.**

Note: Norms are only valuable if the Team regularly references them and holds each other accountable for upholding them. Consider establishing a few rituals to keep the Team's norms alive, such as:

- Posting norms and/or including them in any printed agenda
- Building in time at the end of each meeting, or at periodic times in the year, to reflect on the extent to which the Team is upholding norms, and whether any norms need to be added, modified, or removed
- Rotating the role of process observer, whose job it is to pay attention to whether norms are followed

DATA TEAM MEETING AGENDA   1.4.2T

Purpose	Tools for launching or supporting the work of a District Data Team.
Description	This template is a good model for meeting agendas that lead to productive meetings.
Time	Ongoing.

Related Documents
1–Getting Ready Module
1.4.1T: Norm Setting
           Protocol
1.4.3T: Data Team
           Meeting Minutes

Location:

Meeting Date:

Agenda

Item #	Subject	Presenter

Resources

Items/Resources to Bring to Meeting	Items/Resources to Be Distributed at Meeting

Data Team Norms: (List all norms established and recorded by the Data Team—this list should appear on all meeting agendas.)

Purpose	Tools for launching or supporting the work of a District Data Team.
Description	To improve the effectiveness and efficiency of quality communication, it is a good idea to capture meeting minutes accurately and efficiently. This template can serve as a good model to follow.
Time	Ongoing.

Related Documents
1–Getting Ready Module
1.4.1T: Norm Setting
        Protocol
1.4.2T: Data Team
        Meeting Agenda

Location	
Meeting Date	
Submitted by (name)	
Submitted date	

Members present	Name	Role
	(list names)	(list roles)

Agenda Item #	
Subject	
Discussion	

Decisions/Action Steps	Person Responsible	Timeline

Agenda Item #	
Subject	
Discussion	

Decisions/Action Steps	Person Responsible	Timeline

Agenda Item #	
Subject	
Discussion	

Decisions/Action Steps	Person Responsible	Timeline

Insert rows for additional agenda items as needed.

DATA INVENTORY TEMPLATE   1.5.1T

Purpose	To develop an inventory of currently available data and how the data are being used in service of teaching and learning.	**Related Documents** 1–Getting Ready Module 1.5.2T: Data Inventory Template: SIMS and EPIMS Data 1.5.3R: ESE Data Resources
Description	Complete the attached templates to determine current availability and use of data in the district.	
Time	1–2 hours to review template; 1–2 weeks to gather information, with ongoing upkeep.	

NOTES:

- The sections of this Data Inventory align to the four domains of data described in the text of the *Getting Ready* module: demographics, district and school processes, stakeholder perceptions, and student outcomes.

- *1.5.2T* has been pre-populated with all the data elements collected for SIMS and EPIMS.

- If the Team has completed *1.8.1T Data Literacy Training Catalogue* or *2.2.1T Inventory of District and School Initiatives,* it may want to have those results available for reference for this process.

- A Team might want to copy and paste these tables into Excel in order to be able to sort and group the information.

DIRECTIONS:

1. Organize data elements into district-wide and school-based data:

    a. District-wide Data is common across all schools, a set of grade-alike schools (e.g. elementary) or at least across a given population (e.g. all 5th graders, all English Language Learners, or all students who receive free or reduced lunch)

    b. School-based Data is that which is not necessarily collected in other schools in the district, such as data a principal decides on his or her own to collect and use with school personnel, or data for unique programs such as Expanded Learning Time or pilot schools.

2. For each assessment or element, provide the indicated information in the columns to the right.

    a. Location/Owner of Data refers to the physical location of the data, e.g., Education Data Warehouse or school paper files.

    b. Access refers to the degree to which the data are available to District Data Team members. (1 = hard to access; 4 = easily accessible).

    c. Current Data Use describes how the data are used to inform decisions at the district, school, and/or classroom level.

3. Consider involving others in the data collection:

    a. Ask personnel such as the SIS data manager, assessment coordinator, or guidance director to contribute information.

    b. Consider having each school complete sections A2, B2, C2, and D2, in order to learn what schools collect and how the data are used.

<<District Name>> Data Inventory

SECTION A1— Demographic Data: District-wide Measures

Instructions: In the table below, list all the district-wide data elements currently collected that relate to the demographics and indicators of *all* students, teachers, and other district staff, e.g., race, gender, special education, ELL, grade level, lunch status, program participation, cost per pupil, average teacher salary, or time on learning. Not all columns may apply to all elements.

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)						

<<School Name>> Data Inventory

SECTION A2— Demographic Data: School-based Measures

Instructions: In the table below, list all the data elements currently collected related to the demographics and indicators of *only some* students, teachers, and other district staff, e.g., race, gender, special education, ELL, grade level, lunch status, program participation, cost per pupil, average teacher salary, or time on learning. Not all columns may apply to all elements.

Data Element	School	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)							

\<\<District Name\>\> Data Inventory

SECTION B1 — District and School Processes: District-wide Measures

Instructions: In the table below, list all district-wide data elements currently collected that relate to the many processes that take place in the **district**. This includes information on (or generated by) specific programs, instruction, curriculum, professional development, hiring, finances, facilities, technology, and district policies. Not all columns may apply to all elements.

Data Element	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)					

<<School Name>> Data Inventory

SECTION B2— District and School Processes: School-based Measures

Instructions: In the table below, list all the data elements currently collected that relate to the many processes that take place in the *schools*. This includes information on (or generated by) specific programs, instruction, curriculum, professional development, hiring, finances, facilities, technology, and district policies. Not all columns may apply to all elements.

Data Element	School	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)						

<<District Name>> Data Inventory

SECTION C1— Stakeholder Perception Data: District-wide Measures

Instructions: In the table below, list all the district-wide data elements currently collected that relate to the values, beliefs, and perceptions that teachers, students, parents, and other stakeholders have of the working and learning environment of the district. This includes data from surveys, focus groups, program evaluations, and other formal feedback systems. (Not all columns may apply to all elements).

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)						

<<School Name>> Data Inventory

SECTION C2— Stakeholder Perception Data: School-based Measures

Instructions: In the table below, list all the data elements collected by schools that related to the values, beliefs, and perceptions that teachers, students, parents, and other stakeholders have of the working and learning environment of the district. This includes data from surveys, focus groups, program evaluations, and other formal feedback systems. (Not all columns may apply to all elements).

Data Element	School	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)							

<<District Name>> Data Inventory

SECTION D1— Student Outcome Data: District-wide Measures

Instructions: In the table below, list the name of each student outcome measure that is currently collected for *all* students in a given grade level district-wide. Examples include common assessments (such as MCAS, MELA-O, or common mid-terms), as well as other outcome data (mobility, course grades, GPA, attendance and graduation). For each assessment, provide the indicated information in the columns to the right. (Not all columns may apply to all elements). If an element is not collected for all students in a given grade, record it in Section A2.

Data Element	Grade Level(s)	Content Area(s)	Date Administ-ered	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
Attendance rate	*All*	*N/A?*	*Daily*	*Student Information Management System (SIS)*	*Monthly*	*2*	*Monthly principal attendance reports.*
(add more rows as needed)							

<<District Name>> Data Inventory

SECTION D2— Student Outcome Data: School-based Measures

Instructions: In the table below, list the data elements related to student outcomes that are currently collected for ***only some*** students at the same grade-level district-wide. For example, some schools may implement commercial assessments that others do not. For each student outcome data element, provide the indicated information in the columns to the right. (Not all columns may apply to all elements).

Data Element	School	Grade Level(s)	Content Area(s)	Date Adminis-tered	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
(add more rows as needed)								

DATA INVENTORY TEMPLATE: SIMS AND EPIMS DATA   1.5.2T

Purpose	To develop an inventory of currently available data and how the data are being used in service of teaching and learning.
Description	The attached template is pre-populated with the data elements collected for SIMS and EPIMS. Districts can use this as a starting point to determine current availability and use of this data in the district, in conjunction with other data identified in the district's Data Inventory.
Time	1–2 hours to review template; 1–2 weeks to gather information, with ongoing upkeep.

Related Documents
1–Getting Ready Module
1.5.1T: Data Inventory
    Template
1.5.3R: ESE Data
    Resources

Notes:

- This tool is meant to be used in conjunction with *1.5.1T: Data Inventory Template*, which has further guidance and directions.

    o The *DOExxx* series represents data elements from the Student Information Management System (SIMS)

    o The *IDxx, SRxx, and WAxx* series represent data elements from the Education Personnel Information Management System (EPIMS)

- For descriptions and more information on these data elements see:

    o SIMS Version 2.1 Data Handbook http://www.doe.mass.edu/infoservices/data/sims/DataHandbook.pdf

    o EPIMS Data Handbook: http://www.doe.mass.edu/infoservices/data/epims/

Directions:

1. For each data element identified, confirm the information that is pre-populated, and complete the remaining columns.

    a. Location/Owner of Data refers to the physical location of the data, e.g., Education Data Warehouse or school paper files, and/or the person or department who is responsible for collecting the data and ensuring their quality.

    b. Access refers to the degree to which the data are available to District Data Team members. Rate Access on a scale of 1–4 (1 = hard to access; 4 = easily accessible).

    c. In the Current Data Use column, describe how the data are currently used to inform district-level decisions. The Team can decide if it also wants to describe how the data are used to inform decisions at the school or classroom levels.

<<District Name>> Data Inventory

SECTION A1— Demographic Data: District-wide Measures (SIMS and EPIMS Data)

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
The *DOExxx* series represents data elements from the Student Information Management System (SIMS)						
DOE001 – Locally Assigned Student Identifier (LASID)	All	All				
DOE002 – State Assigned Student Identifier (SASID)	All	All				
DOE003 – Student First Name	All	All				
DOE004 – Student Middle Name	All	All				
DOE005 – Student Last Name	All	All				
DOE006 – Student Date of Birth	All	All				
DOE007 – Date of Birth Format	All	All				
DOE008 – City/Town of Birth	All	All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
DOE009 – Gender	All	All				
DOE010 – Race/Ethnicity	All	All				
DOE011 – Reason for Reporting	All	All				
DOE012 – Enrollment Status at Time of Data Collection	All	All				
DOE013 – Reason for Enrollment	All	All				
DOE014 – City/Town of Residence – Student	All	All				
DOE015 – School Identification Number	All	All				
DOE016 – Grade Level	All	All				
DOE017 – Days in Attendance	All	All				
DOE018 – Days in Membership	All	All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
DOE019 – Low-Income Status	All	All				
DOE020 – Title I Participation	All	All				
DOE021 – LEP Students in their First Year in U.S. Schools	All	All				
DOE022 – Immigration Status	All	All				
DOE023 – Country of Origin	All	All				
DOE024 – First (Native) Language	All	All				
DOE025 – Limited English Proficiency	All	All				
DOE026 – English Language Learners Program Status	All	All				
DOE027 – Alternative Education	All	All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
DOE028 – Title I School Choice Participation	All	All				
(DOE029 & DOE030 were discontinued)	All	All				
DOE031 – Career/Vocational Technical Education – Competency Attainment	All	All				
DOE032 – Special Education Placement, ages 3–5	Pre-K to 1st	All				
DOE033 – High School Completer Plans	12	All				
DOE034 – Special Education Placement, ages 6–21	1–12	All				
DOE035 – Career/Vocational Technical Education – Type of Program	6–12	All				
DOE036 – Special Education – Nature of Primary Disability	All	All				
DOE037 – Graduate, Completed Massachusetts Core Curriculum	12	All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
DOE038 – Special Education – Level of Need	All	All				
(DOE039 has been discontinued)						
DOE040 – Special Education Evaluation Results	All	All				
(DOE041 has been discontinued)						
DOE042 – Career/Vocational Technical Education – Special Population	6–12	All				
DOE043 – Career/ Vocational Technical Education - Chapter 74–Approved VTE Program Participation	6–12	All				
DOE044 – Career/Vocational Technical Education – Non-Chapter 74 Career and Technical Education Program Participation	12	All				
DOE045 – Number of In-School Suspensions	All	All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
DOE046 – Number of Out-of-School Suspensions	All	All				
DOE047 – Advanced Placement Course 1	All	All				
DOE048 – Advanced Placement Course 2	All	All				
DOE049 – Advanced Placement Course 3	All	All				
DOE050 – Advanced Placement Course 4	All	All				
DOE051 – Advanced Placement Course 5	All	All				
DOE052 – Student Truancy	All	All				
The IDxx, SRxx, and WAxx series represent data elements from the EPIMS						
ID01, ID02, ID03 – Staff First, Middle, and Last Names		All				
ID04 – Staff Date of Birth		All				
ID05 – Staff Gender		All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
ID06 – License / Certification Number		All				
ID07 – Local Employee Number		All				
SR01 – Massachusetts Education Personnel Identifier (MEPID)		All				
(SR02 & SR03 align with ID07 and ID06, respectively)						
SR04 – SR07 align with ID01–ID04, respectively)						
SR08 – Race-Ethnicity		All				
SR09 – Employment Status at Time of Data Collection		All				
SR10 – Reason for Exit		All				
SR11 – Date of Hire		All				
SR12 – Federal Salary Source 1		All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
SR13 – Percent of Federal Salary Source 1		All				
SR14 – Federal Salary Source 2		All				
SR15 – Percent of Federal Salary Source 2		All				
SR16 – Federal Salary Source 3		All				
SR17 – Percent of Federal Salary Source 3		All				
SR18 – Degree Type 1		All				
SR19 – Degree Institution 1		All				
SR20 – Degree Subject 1		All				
SR21 – Degree Type 2		All				
SR22 – Degree Institution 2		All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
SR23 – Degree Subject 2		All				
SR24 – Degree Type 3		All				
SR25 – Degree Institution 3		All				
SR26 – Degree Subject 3		All				
WA01 – Massachusetts Education Personnel Identifier (MEPID)		All				
WA02 – (see ID07– Local Employee Number)		All				
WA03–WA05 (see ID01–ID03)		All				
WA06 – District / School Identification Number		All				
WA07 – Job Classification		All				
WA08 – Teacher / Paraprofessional Assignment		All				

Data Element	Grade Level(s)	Program/ Department/ Content Area(s)	Location/ Owner of Data	Date Data Available	Access (1–4)	Current Data Use
WA–09 – Grade		All				
WA10 – Subject Area-Course Code		All				
WA11 – Class Section		All				
WA12 – Full Time Equivalent (FTE) (as per DSSR)		All				
WA13 – NCLB Instructional Paraprofessional Requirements		All				
WA14 – Highly Qualified Teacher Status		All				
WA15 – Subject Matter Competency		All				

ESE DATA RESOURCES   1.5.3R

Purpose	This group of resources and tools can help a District Data Team understand what data is made available to districts by the Massachusetts Department of Elementary and Secondary Education, what it means, how to access it, and how to use it effectively.
Description	Website links to the most current information on a variety of data sources.
Time	Ongoing.

Related Documents
1–Getting Ready Module
1.5.1T: Data Inventory Template
1.5.2T: Data Inventory Template: SIMS
and EPIMS Data

The majority of data available from the ESE resides in one of two locations:

1. Education Data Warehouse: A collaborative effort of ESE and local school districts to centralize K–12 educational performance data into one state-coordinated data repository hosted by the Department. It contains the SIMS and MCAS data for every district in the state and will soon contain the EPIMS data for every district in the state. Data are available at the level of the state, district, group, and individual student. Over 30 reports exist to compare data from individual schools and districts to state totals. After receiving appropriate training, districts can load local data into the EDW and write their own reports. EDW training materials and data can be accessed via the security portal. EDW Quick Tips and the EDW User Guide from the Information Service's Education Data Warehouse are available for download on the EDW webpage: http://www.doe.mass.edu/infoservices/dw/.

2. School/District Profiles: Sortable data reports on a variety of information, including enrollment, teacher data, and MCAS results. Data are available at the level of the state, district, and group, but not at the level of individual student. Directories and reports from individual organizations can also be found here: http://profiles.doe.mass.edu/.

Other sources of data are indicated as appropriate.

The MA ESE also publishes an annual data collection schedule which includes forms, descriptions of data, technical guidance, and access information for data that are transmitted from districts to the state:
http://www.doe.mass.edu/infoservices/data/schedule.html.

ESE Data Resources

Data Element and Brief Description	Release Schedule	Source of Data	User Guides and Other Resources
Massachusetts Comprehensive Assessment System (MCAS): Designed to test all public school students in the state, measure performance based on the Massachusetts Curriculum Framework learning standards, and report on the performance of individual students, schools, and districts.	Annually, in June	Data Warehouse School/District Profiles	http://www.doe.mass.edu/mcas/ Information on MCAS participation and graduation requirements, testing schedules, test administration resources, test design and development, sample questions, scoring guides, technical reports and results, as well as information on training sessions for the above. Additional guidance is available in the Data Warehouse trainings, which can be accessed through the security portal.
Adequate Yearly Progress (AYP): A measure of the extent to which a student group demonstrates proficiency in English language arts and mathematics based on MCAS results. AYP Reports are issued each year and show the progress schools and districts are making toward the goal of having all students reach proficiency by the year 2014.	Annually, in October	See link in next column	http://www.doe.mass.edu/sda/ayp/ Access to reports on AYP data as well as the review and release schedules, baseline and improvement data, student performance goal spreadsheet, and interpretive materials. Includes information on the Composite Performance Index (CPI).
Student Growth Percentile: The growth model complements the MCAS year-by-year test scores, since it reports change over time rather than grade-level performance results in any one year.	Annually, in September	Data Warehouse School/District Profiles	http://www.doe.mass.edu/mcas/growth/ Links to student growth scores at the level of district, school, and student group, as well as resources for understanding and using the data.

ESE Data Resources

Data Element and Brief Description	Release Schedule	Source of Data	User Guides and Other Resources
Massachusetts English Proficiency Assessment–Reading/Writing (MEPA-R/W): Assesses LEP students' proficiency in reading and writing at grades K–12. **Massachusetts English Language Assessment–Oral (MELA-O)** assesses LEP students' proficiency in listening (comprehension) and speaking (production) at grades K–12.	Early June	See link in next column	http://www.doe.mass.edu/mcas/mepa/ Reports of results as well as information on English Language Proficiency Benchmarks and Outcomes (ELPBO), student participation requirements, sample student work and scoring guides, MEPA test administration resources, and information on training for the above.
EPIMS: Collects demographic data and work assignment information on individual public school educators, enabling Massachusetts to comply fully with the No Child Left Behind Act by accurately reporting on highly qualified teachers. EPIMS replaced the DSSR (District School Staffing Report).	Three times a year (starting in SY2011)	Education Data Warehouse (beginning in 2010)	http://www.doe.mass.edu/infoservices/data/epims/ Data collection training materials, data handbook, list of support specialists, maintenance tutorials, FAQs, and a list of vendors. Note: Beginning in SY2011, EPIMS data will be collected in October, March, and at the end of the year, and are generally available in the EDW 2–3 months later.
SIMS: A student-level data collection system that allows the Department to collect and analyze more accurate and comprehensive information, to meet federal and state reporting requirements, and to inform policy and programmatic decisions. Includes a unique student identifier for all students receiving a publicly funded education in Massachusetts.	Three times a year	Education Data Warehouse	http://www.doe.mass.edu/infoservices/data/sims/ SIMS user guide, data handbook, and other training guides, as well as information on SIMS expansion, SSDR, reporting schedule, reporting guidelines, FAQs, and information on vendors. Note: SIMS data is collected via the security portal in October, March, and at the end of the year, and are generally available in the EDW 2–3 months later.

ESE Data Resources

Data Element and Brief Description	Release Schedule	Source of Data	User Guides and Other Resources
Statistical Reports. The ESE provides statistical reports in the following areas: • Graduation rates • Grade retention reports • Dropout rates • Educator data • Enrollment data • Plans of high school graduates • Student exclusions • School and district data reports • State profile	Varies	See link in next column	http://www.doe.mass.edu/infoservices/reports/ Links to other ESE web pages with data and additional information on each type of statistical report. Note: The Select Report list for School and District Data Reports has some but not all of the same reports available in the Quick Statewide Reports list on the School and District Data Reports page itself.
Statistical Comparisons. The ESE provides statistical comparisons for districts in the following areas: • Per pupil expenditure reports • Enrollment trends • Average teacher salaries • Special education direct expenditure trends • School and district data reports • State profile	Varies	See link in next column	http://finance1.doe.mass.edu/statistics/ Links to data reports and supporting resources. Some data sets allow for easy comparison to similar districts, and can be easily downloaded as Excel files.

Purpose	To assess the effectiveness of data collection systems.	**Related Documents** 1–Getting Ready Module
Description	For data to effectively provide information to further the inquiry process, they must be complete, accurate, and disseminated in a timely manner. Within a busy district or school environment, this is often difficult to achieve. This activity provides an opportunity for the District Data Team to identify strengths and areas for improvement in the district's data collection, storage, and dissemination systems.	
Time	30 minutes to develop a distribution plan. Variable for data survey completion and tabulation. One hour for survey analysis.	

Directions

1. The District Data Team should familiarize itself with the self-assessment instrument and delete any items necessary to adapt it to the Team's local situation.

2. As a team, determine who should participate in the survey process.

3. Distribute the instrument to the target audience.

4. Collect and tabulate the results.

5. Analyze the results to determine the effectiveness of the data collection, storage, and dissemination systems.

6. Recommend changes to improve the system as necessary.

Data Collection, Storage, and Dissemination Self-Assessment

This survey is designed to gather your perception of the efficiency and effectiveness of data collection, storage, and dissemination in your district. Please share your perceptions by indicating your degree of agreement with the following statements.

Data Task	Statement about Data	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
Data Collection	Policies and protocols are in place to guide data collection in the district.	1	2	3	4	N/A
	A schedule is in place that indicates when various data elements should be collected.	1	2	3	4	N/A
	There are staff charged with collecting data.	1	2	3	4	N/A
	Staff charged with collecting the data have a clear understanding of what the data will be used for.	1	2	3	4	N/A
	Staff charged with collecting the data know the protocols for inputting the data, e.g., field names and locations.	1	2	3	4	N/A
	Staff charged with collecting the data are provided with an environment that promotes the accurate input of data, e.g., free of distractions, no conflicting tasks.	1	2	3	4	N/A
	Staff charged with collecting data have adequate time to complete their tasks.	1	2	3	4	N/A
	Staff charged with collecting the data have been trained in data input techniques and data use concepts.	1	2	3	4	N/A

Data Task	Statement about Data	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
	Appropriate hardware is available to expedite the collection of data.	1	2	3	4	N/A
	Appropriate software applications are available to facilitate the collection of data.	1	2	3	4	N/A
	Protocols are in place to monitor the accuracy and completeness of the data inputted.	1	2	3	4	N/A
	Staff charged with collecting data adhere to district guidelines for recording data.	1	2	3	4	N/A
	State and federal confidentiality regulations are followed by those responsible for collecting data.	1	2	3	4	N/A
	Systems are in place to ensure that complete and accurate data are recorded.	1	2	3	4	N/A
	Staff who are responsible for data collection are included in establishing data collection protocols and policies.	1	2	3	4	N/A
	Staff charged with the collection of data are consulted to determine changes that need to be made to improve data collection processes, e.g., accuracy, completeness, security.	1	2	3	4	N/A
Data Storage	Data are added to the student information system in a timely manner.	1	2	3	4	N/A

Data Task	Statement about Data	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
	Data stored in the student information system can be easily uploaded to the data warehouse.	1	2	3	4	N/A
	Data from various sources can easily be uploaded to the central district storage medium.	1	2	3	4	N/A
	Web-based applications are in place to facilitate the uploading of data to the central district storage medium.	1	2	3	4	N/A
	Data are archived to provide the basis for longitudinal analysis.	1	2	3	4	N/A
Data Dissemination	Data can easily be retrieved from the student information system and/or data warehouse to provide reports that answer specific questions.	1	2	3	4	N/A
	A system exists to facilitate the acquisition of data by staff to answer questions to improve teaching and learning.	1	2	3	4	N/A
	Reports are routinely generated and disseminated to key staff to answer questions related to improving teaching and learning.	1	2	3	4	N/A
	Staff members know how to access data that they need to answer questions to improve teaching and learning.	1	2	3	4	N/A

Data Task	Statement about Data	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Applicable
	Reports generated through the district data information systems are easy for staff to understand.	1	2	3	4	N/A
	Reports are disseminated in a timely manner.	1	2	3	4	N/A

DATA DISSEMINATION SCHEDULE EXAMPLE   1.7.1R

Purpose	To communicate data availability and use broadly throughout the district.
Description	This is an example of a Data Dissemination Schedule.
Time	Ongoing.

Related Documents
1–Getting Ready Module
1.7.2T: Data Dissemination
       Schedule Template
1.7.3R: ESE Policies for Data
       Access

Scenic Cove School District
Sample Data Dissemination Schedule
2009–2010

Time Frame	Data Displays	Disseminated To	Purpose	Action

August	Longitudinal Trends
	    MCAS (2002–2009)
	    Subtests
		Data overview presentation to the district leadership team	Collaborative problem identification and clarifying question formulation	1. Articulate problem
				2. Craft clarifying questions
				3. Identify additional data needed
				4. District Data Team collects and analyzes data and builds data displays for next meeting

	Opening of school demographics and program participation
	    By grade level
	    By team
		Principal
		Team leaders
			Overview of composition of school and teams	Balance teams

September	Middle school performance of incoming ninth graders by team	Principal Team leaders Grade 9 teachers	Identify populations in need of intervention	Conduct a data overview for each school-level team
	Lists of students in at-risk populations, e.g., Grade 8 Failures; Grade 8 Poor Attendance.	Grade 9 team leaders and teachers	Identify specific students for intervention	Develop interventions as necessary for identified students at the team or grade level

Purpose	To communicate data availability and use broadly throughout the district.
Description	In this activity, a District Data Team will construct and publish a schedule for the distribution and use of major data elements.
Time	Ongoing.

Related Documents

1–Getting Ready Module
1.7.1R: Data Dissemination
   Schedule Example
1.7.3R: ESE Policies for Data
   Access

<<District Name>>
Data Dissemination Schedule
<<School Year>>

Time Frame	Data Displays	Disseminated To	Purpose	Action
August				
September				
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				

ESE POLICIES FOR DATA ACCESS 1.7.3R

Purpose	To connect districts to current ESE policies for data access in order to inform district policies on data access and dissemination.
Description	These documents should be reviewed, and corresponding district policies developed, prior to disseminating data within the district.
Time	N/A.

Related Documents
1–Getting Ready Module
1.7.1R: Data Dissemination
          Schedule Example
1.7.2T: Data Dissemination
          Schedule Template

These ESE Education Data Warehouse resources provide background information necessary for a District Data Team, in conjunction with the district's Information Technology Department, to assign data access consistent with federal, state, and local regulations.

Website	Brief Description
1 http://www.doe.mass.edu/infoservices/dw/accesspolicy.pdf	The Statewide Educational Data Warehouse Project Policy Statement outlines the legal authorities at both the federal and state levels that govern the information exchange and access, and confidentiality of student records and personally identifiable information." It provides information on: • User agreements • Confidentiality policies • Third party access to information in the Data Warehouse
2 http://www.doe.mass.edu/infoservices/dw/chapter2.pdf	The Security and Training in Chapter Two of the Education Data Warehouse User Guide provides information on: • Security and user administration • Maintaining confidentiality • Suppressing aggregate data for small groups • Responsibilities of the directory administrator • District data access policies • Training district users

Purpose	This group of resources and tools will help a District Data Team build district-wide capacity to use data.
Description	This template will help the Team identify the training and support the district currently provides for data literacy.
Time	Ongoing.

Related Documents
1–Getting Ready Module
1.8.2R: Assessment Glossary

Directions

1. Begin by listing the data used in your district. If you have completed *1.5.1T: Data Inventory*, you can use that list of data elements. If you have not yet completed a data inventory, you may want to begin by focusing this activity on the most commonly used data elements.

2. After you have listed the data, complete the next three columns.

3. As you consider each data element, make note of any opportunities for improvement.

Data Element	Training or Resource Provided	Audience	Department Responsible

Data Element	Training or Resource Provided	Audience	Department Responsible

ASSESSMENT GLOSSARY   1.8.2R

Purpose	This group of resources and tools will help a District Data Team build district-wide capacity to use data.
Description	This document outlines general assessment terminology.
Time	Ongoing.

Related Documents
1–Getting Ready Module
1.8.1T: Data Literacy
     Training Catalog

Note: These terms apply primarily to student assessment data, but could be extrapolated to apply to other forms of data, such as those related to adult practice or district systems and processes.

Aggregated Data: Data that are presented in summary (as opposed to student-level data or data broken down by student group).

Alignment: Judgmental procedures undertaken to ensure the content of state tests appropriately reflects the knowledge, skills, and abilities articulated in the state's content standards for each grade level and subject area.

Benchmark: A standard against which something can be measured or assessed.

Cohort: A group of individuals sharing a particular statistical or demographic characteristic.

Decile: One of ten segments of a distribution that has been divided into tenths. The ninth decile shows the number (or percentage) of the norming group that scored between 80 and 90 NCE.

Disaggregation: Summary data split into different subgroups, e.g., gender, race, ethnicity, lunch status.

Distractor: An incorrect option in a multiple choice test item.

Equating: A set of statistical procedures undertaken in order to a) adjust for differences in the difficulty of different test forms for the same subject area and grade level from year-to-year (horizontal equating), or b) scale test scores (and/or performance levels) so they have a consistent meaning across adjacent grade levels (vertical equating, vertical scaling, vertical articulation or moderation).

Formative: Assessments at regular intervals of a student's progress designed to provide information to improve the student's performance.

Gain Score: The difference between two administrations of the same test. A student can have either a positive or negative gain.

Generalization: Application of inference to a population greater than the sample.

Inference: A conclusion that is drawn from a data set. The process of using data from a sample of students to generalize to other similar groups of students, such as assuming the observed three-year upward trend in 10th grade mathematics achievement will continue next year.

Item: An individual question or exercise in an assessment or evaluative instrument.

Mean: The average of a set of scores.

Measure: Outcome data that can be used to measure the performance of a student or group of students. Includes test scores, attendance, discipline, grades, and credits earned.

Median: The score that is the midpoint in a series of scores; half of the data values are above the median, and half are below.

Mode: The score that occurs most frequently in a series of scores.

Norm Group: A group of students with similar characteristics, i.e., age, number of months from the start of the school year, number of years in school, selected to take a test to provide a range of scores and establish the percentiles of performance for use in establishing scoring standards.

Normal Curve: The bell-shaped curve of the normal distribution.

Normal Curve Equivalent: A score that ranges from 1–99 often used to compare different tests for the same student or group of students on the same test. Mathematically, an NCE is a normalized test score with a mean of 50 and a standard deviation of 21.06.

Normal Distribution: A distribution of scores where the scores are distributed symmetrically above and below the mean.

Norm-Referenced Test: Standardized tests designed to compare the scores of children to scores achieved by children the same age who have taken the same test.

Percent Correct: A percentage that expresses the number of raw points earned by a test taker divided by the number of raw points possible on the test.

Percent Proficient: The percentage of students who scored higher than the cut score defined by the test.

Percentile: A score that indicates the percentage of a reference or norm group obtaining scores equal to or less than the test-taker's score.

Performance Assessment: Assessments that measure skills, knowledge, and ability directly through a performance or demonstration by the student.

Population: Every student who is eligible to become a member of a specific sample of students. For example, the population of 10th graders is all 10th graders who may be enrolled in the district.

Quartile: A division of percentile scores into four equal groups. For example, Q1 = 0 to 25th percentile scores.

Range: The difference between the highest and lowest score in a distribution of scores.

Raw Score: The number of points earned on a test or subtest.

Reliability: The degree to which the results of an assessment are dependable and consistently measure particular student knowledge and/or skills. Reliability is an indication of the consistency of scores across raters, over time, or across different tasks or items that measure the same thing. Thus, reliability may be expressed as a) the relationship between test items intended to measure the same skill or knowledge (item reliability), b) the relationship between two administrations of the same test (or comparable tests) to the same student or students (test/retest reliability), or c) the degree of agreement between two or more raters (rater reliability). An unreliable assessment cannot be valid.

Sample: Group of students included in a data set. For example, the group of 10th graders in a district for any one school year is a sample of the entire population of 10th graders who may be enrolled in the district. The extent to which that group of 10th graders is representative of the entire population is the extent to which generalizations can be made to 10th graders in the future.

Sampling Error: Statistical terminology for the possibility that a particular sample chosen to study may be unusual in some way, leading to invalid or inaccurate inferences about the characteristics of the larger population from which the sample was drawn. For example, when comparing the performance of 10th graders in one year to 10th graders in the next, it is important to bear in mind that the performance is based on two different groups (samples) of 10th graders who may have different characteristics.

Scaled Scores: In the same way that the centigrade thermometric scale can also be expressed on the Fahrenheit scale, student raw scores can be converted to scaled scores. Equating adjustments may result in different raw score ranges for performance levels from year-to-year. Raw scores can be scaled so that scaled score ranges for performance levels stay the same from year-to-year.

Scoring Rubrics: Guidelines for judgmental procedures for assigning values to student performance such as checklists, yes or no, numerical rating scales, i.e., 1-6, or descriptive, i.e., the student presented multiple points of view to support her essay.

Standard Error of Measurement (SEM): Based on the reliability of a test—the higher the reliability, the lower the SEM. SEM can be used to put an ‒uncertainty" band around individual raw scores and scaled scores.

Standardization: A consistent set of procedures for designing, administering, and scoring an assessment. The purpose of standardization is to assure that all students are assessed under the same conditions so that their scores have the same meaning and are not influenced by differing conditions.

Stanine: A normalized score that describes pupil performance on an equally distributed nine-point scale ranging from 1 to 9.

Subtest: A group of test items that measure a specific area, i.e., mathematics calculation and reading comprehension. Several subtests make up a test.

Summative: Assessments used to provide information in order to make a judgment about a student's achievement at the end of a period of instruction.

Validity: The extent to which an assessment measures what it is supposed to measure and the extent to which inferences and actions made on the basis of test scores are appropriate and accurate. For example, if a student performs well on a reading test, how confident are we that that student is a good reader? A valid standards-based assessment is aligned with the standards intended to be measured, provides an accurate and reliable estimate of students' performance relative to the standard, and is fair. An assessment cannot be valid if it is not reliable.

Definitions were compiled from the following sources:

CRESST Assessment Glossary, found at http://www.cse.ucla.edu;

Slaughter, R. (2008). *Assessment literacy handbook: A guide for standardized assessment in public education*. Portsmouth, NH: Public Consulting Group, Inc.

Massachusetts Department of Elementary and Secondary Education. (2008). *Data Warehouse 102 Handbook: Understanding MCAS Reporting*. Malden, MA: Author.

MANAGING CHANGE AND UNDERSTANDING CONCERNS PROTOCOL 1.9.1T

Purpose	To enable the District Data Team and others to gain a better understanding about its concerns and the concerns of other staff as the change to a district norm of inquiry and data use moves forward.
Description	In this activity, the Team will review common concerns associated with change and brainstorm ways to mitigate concerns related to the implementation of the Data-Driven Inquiry and Action Cycle.
Time	30–45 minutes.

Related Documents
1–Getting Ready Module

Note: Keep in mind that this activity is a good faith attempt to take into account the concerns of constituents, but there is no way to know for sure without asking them directly. A District Data Team may choose to follow in this protocol on its own, or to engage different stakeholders in the process through surveys or focus groups. While the former approach may take less time, the latter could generate valuable perspectives and ideas that the Team may not think of on its own.

Directions:

1. As a group, identify the stakeholders who will likely be impacted by the district's increased focus on data use, inquiry, and action.

2. Individually review the seven stages of concern that individuals commonly experience in response to a change effort. Record specific concerns the various stakeholders may have for each of the stages. Be sure to include yourself and your own concerns. Individuals may ask themselves —What am I hearing from the field?"

Stage	General Concern	Potential Specific Concerns of Stakeholders
Awareness	What is this change I've been hearing about?	
Information	Tell me everything I need to know.	
Personal	What does this mean for me?	
Management	How will I manage all of this?	
Consequence	What will happen if I do implement the change? What will happen if I don't?	
Collaboration	How can we help each other through the change?	
Refocusing	How can I make it even better?	

3. Work as a group to record everyone's responses for each of the stages. Use chart paper or project typed notes so all can see and read the responses.

- Note: If the Team has completed *1.2.1T: Barriers to Effective Data Use*, it may want to revisit and compare the responses. Does this make the group think of any additional stakeholders that need to be considered, or concerns to address?

4. As a group prioritize* which concerns are most important for the District Data Team to address as it pursues this work, the group should narrow the list to 2–5 specific concerns. In doing this, the team might consider:

- *Which stage, as a whole, best represents the general sentiment of the district?*

- *Which specific concerns, if resolved, would result in the greatest shift toward an embedded culture of data use, inquiry, and action?*

- *Which concerns does the District Data Team have the greatest potential and leverage to address?*

*One quick strategy for prioritizing is multi-voting. Give each team member a number of votes that represents 1/3 to 1/2 of the total ideas generated, e.g., if 21 ideas were generated, each member could get 8 votes. Members cast one vote for each idea they see as a priority. Tally the votes to determine which ideas are seen as the greatest priorities.

5. As a group, brainstorm ways to mitigate the impact of each of the prioritized concerns. Record the suggested strategies on a new sheet of chart paper.

- Note: Again, it may be useful to reference the strategies generated in *1.2.1T: Barriers to Effective Data Use*

Prioritized Concerns	Strategies for Mitigation or Resolution

6. Discuss, prioritize, and come to agreement on the strategies that make the most sense to pursue at this time. Document these strategies and revisit them periodically, noting concerns that get resolved, and new ones that may emerge. The group may want to retain all of the notes from this discussion for future reference as well.

District Data Team Toolkit

Massachusetts Department of ELEMENTARY & SECONDARY EDUCATION

MODULE 2: INQUIRY

Table of Contents

Tools and Resources for Inquiry

2.1.1T: Question Formulation Protocol

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2.3.1T: Data Overview Checklist

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2.4.1T: Building Data Displays Protocol

2.4.2R: Data Display Rubric

2.4.3R: Types of Data Displays

2.4.4R: More Data Display Resources

2.5.1T: Data Overview Brainstorming Protocol

2.5.2T: Focusing Question Investigation Template

INTRODUCTION

WHERE ARE WE NOW?

The District Data Team Toolkit is based on the Data-Driven Inquiry and Action Cycle. The Cycle provides the structure that takes data use within the district from asking the right questions to getting results. It is an iterative process in which the district acts on data to support continuous improvement. The Toolkit uses the steps of the Cycle to structure a progression through the model—you are now in *Module 2: Inquiry*.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Getting Ready	Inquiry	Information	Knowledge	Action	Results

Module 2: Inquiry explores the inquiry process first introduced in *Module 1: Getting Ready*. The activities in this module build the capacity of the District Data Team and key stakeholders to formulate hypotheses about problems identified through an initial review of data displays and develop clarifying questions to dig deeper into the data. Techniques for the acquisition of these data and their analysis are addressed in *Module 3: Information* and *Module 4: Knowledge*.

MODULE OBJECTIVES

The **Inquiry** module will help a District Data Team:

▶ Formulate questions to drive an inquiry process

▶ Create and present effective data displays and data overviews

▶ Identify the data needed to answer the questions

CULTURE OF INQUIRY

THE DATA-DRIVEN INQUIRY AND ACTION CYCLE

The Data-Driven Inquiry and Action Cycle drives the effective use of data to answer critical questions about teaching and learning that result in school improvement and higher achievement for all students. If the Team asks the right questions, collects and analyzes appropriate data to address the questions, views the information it has gathered in the context of findings on research and practice to form an appropriate knowledge base, and takes action on the knowledge it has gained, the district and its schools will improve and its students will perform at higher levels.

The modules in this Toolkit take you step-by-step through the Data-Driven Inquiry and Action Cycle and provide you with the tools and resources necessary to effectively implement this collaborative data use framework. *Module 2: Inquiry* initiates this activity.

Data-Driven Inquiry and Action Cycle

ASKING THE RIGHT QUESTIONS
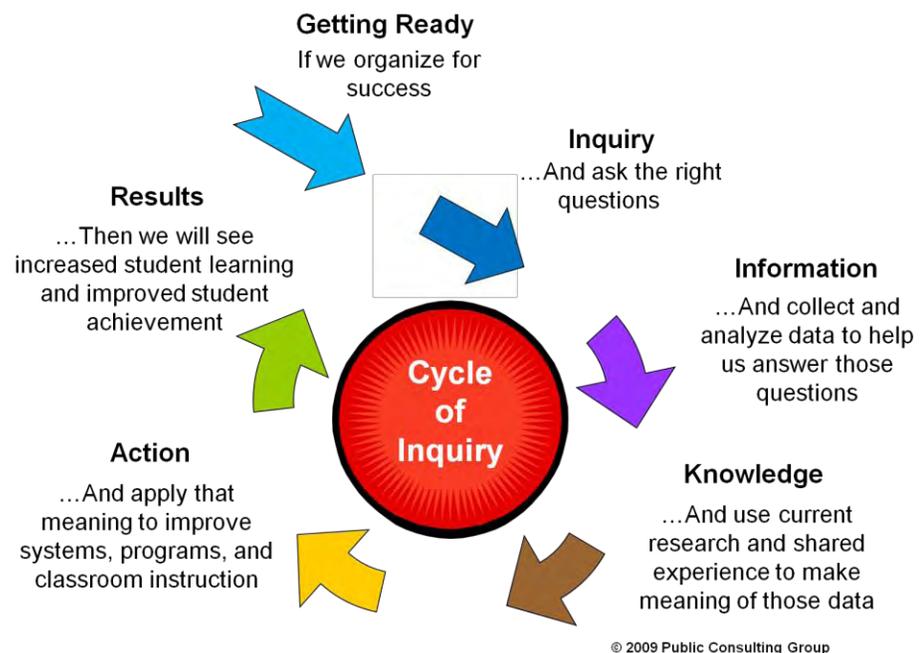
TYPES OF QUESTIONS

Educators ask questions about their district, schools, and students all the time. The questions are based on their observations, experience, gut, and hopefully, on data. The challenge is to craft meaningful questions to drive the inquiry process that are based on all of these sources and that, if answered, will significantly improve teaching and learning in the district.

As the Team formulates questions that will have a direct impact on teaching and learning in the district, it should consider two things.

1. Does the question relate to something over which the district or school has control?

2. Does the question relate to something which, if improved, will have a significant impact on teaching and learning?

Questions about factors that districts and schools can influence form the basis for the action step of the Data-Driven Inquiry and Action Cycle.

The Team may also ask questions about factors that can have an effect on teaching and learning, but that cannot be influenced or changed by districts and schools. These questions are more descriptive in nature and help educators develop a better understanding of their students. This understanding can provide insight into structures and strategies that can be implemented which place teaching and learning in the context of students' experiences.

For example, the size and distribution of the low-income student population in a district is not a factor a district can control. However, knowing the size and distribution of this population may suggest that professional development activities are needed to help teachers better understand the student population and what support they need to learn.

As the Team goes through the question formulation process, it will discover that starting with broad questions to focus its inquiry will lead to the development of narrower questions that will deepen the inquiry process. The broad questions are called focusing questions, while the narrower questions are called clarifying questions. Focusing questions provide a starting point to help the Team identify the data it will need to

> **Q**uestions about factors that districts and schools can influence form the basis for the action step of the Data-Driven Inquiry and Action Cycle.

begin its inquiry. Clarifying questions are generated in response to the analysis of the initial data set and often require the collection and analysis of additional data. In turn, based on this subsequent data collection and analysis, original clarifying questions can become focusing questions for the next phase of inquiry.

An Inquiry-Driven Approach to Data Analysis: Focusing & Clarifying Questions

FOCUSING QUESTION

How did the achievement of the population of English language learners vary across all schools in the Scenic Cove School District?

Data Analysis!

CLARIFYING QUESTIONS

What was the distribution of English language learners across district schools?

How did achievement vary across schools by grade level?

What is the relationship between years in the district and achievement for the ELL population?

QUESTION FORMULATION

Questions that a Team might want to explore can be formulated based on some of the following considerations: demographics, perceptions, school processes, and student outcomes. Each category provides the district a framework for which it can begin to craft both focusing and clarifying questions from the data gathered. Districts can then use those questions to guide the next steps in the data review process.

Demographics	Perceptions	School Processes	Student Outcomes
Race	Values	Programs	Assessments
Gender	Beliefs	Instruction	Course grades
Special education	Perceptions teachers, parents, and students have of the learning environment	Curriculum	GPA
Grade level		Processes	Teacher observations
Lunch status		Policies	Attendance
		Procedures	Dropout rate
		Practices	

Focusing Questions

Broad questions are called focusing questions. Focusing questions provide a starting point to help a Team identify the data it will need to begin its inquiry. By beginning with the broad categories above, a district can begin the process of looking at data across sets of schools.

Sample Focusing Questions

Are the district's teachers utilized in the most effective and efficient manner to meet the needs of its students?

Are teachers throughout the district committed to high levels of learning for all types of learners?

Are the programs for special populations effectively meeting their goals?

What are the characteristics and performance levels of students with high absence rates?

Activity 2.1 Question Formulation Protocol

Throughout this Toolkit, the Team will use protocols to guide productive discussions on a variety of topics. The *Question Formulation Protocol* will help the District Data Team develop, organize, and prioritize questions to structure its inquiry.

(2.1.1T: Question Formulation Protocol)

Clarifying Questions

Narrower questions are called clarifying questions. Focusing questions provide a starting point to help a Team identify the data it will need to begin its inquiry. Clarifying questions are generated in response to the analysis of the initial data set and often require the collection and analysis of additional data. In turn, based on this subsequent data collection and analysis, original clarifying questions can become focusing questions for the next phase of inquiry.

Sample Clarifying Questions

Focusing Question #1: Are the district's teachers utilized in the most effective and efficient manner to meet the needs of its students?

   Potential Clarifying Questions:
   ◆ What is the ratio between special education students and special education teachers in each of the district's schools?
   ◆ Are the "highly qualified teachers" equitably distributed across schools in the district?
   ◆ Are teachers assigned to classes in their area of certification?
   ◆ Are the district's neediest students taught by the most effective teachers?

Focusing Question #2: Are teachers throughout the district committed to high levels of learning for all types of learners?

   Potential Clarifying Questions:
   ◆ Are teachers asking all students questions that would foster higher level thinking skills?
   ◆ Are students placed in least restrictive environments with modifications and accommodations being followed?
   ◆ Do students receive instruction in varied ways that meet their individual learning styles?

Focusing Question #3: Are the programs for special populations effectively meeting their goals?

   Potential Clarifying Questions:
   ◆ Are students in inclusion programs and substantially separate programs achieving proficiency on the state assessment?
   ◆ Over the past three years, has the performance of English language learners improved by the end of grade 6?

♦ Has growth within special populations equaled the growth of the general population?

Focusing Question #4: What are the characteristics and performance levels of students with high absence rates?

Potential Clarifying Questions:
♦ What is the relationship between absenteeism and performance on state assessments?
♦ Which subgroups and grade levels have the highest absence rates? Lowest?
♦ When does high absenteeism occur throughout the school year?
♦ How does the district's absence rate compare to the state?

ALIGNMENT WITH DISTRICT PRIORITIES

The *Question Formulation Protocol* from the previous activity has helped the Team to define the high-priority starting point for its inquiry. But before the Team begins gathering data to answer its questions, it is important to determine if there are initiatives currently underway in the district that relate to the Team's focusing question, and how further investigation of these questions can be coordinated with these existing initiatives. The *Inventory of District and School Initiatives* tool will help the Team identify and create an inventory of district and/or school initiatives. The Team should follow the instructions in the tool to help it relate those initiatives to its focusing question. This information can serve three key purposes:

- Help the Data Team coordinate efforts with other existing teams

- Help the Team identify data that might be available to inform the inquiry process

- Help the Team avoid redundancy when it gets to the point of developing strategies and action steps (*Module 5*)

Activity 2.2 What Current Initiatives Relate to the Focusing Question?

Districts and schools have many initiatives in place at one time. Adding a new initiative that addresses a focusing question may be redundant if the question is already being effectively addressed by an existing initiative. The *Inventory of District and School Initiatives* will identify current initiatives and will provide data on the effectiveness of the implementation of those initiatives.

(2.2.1T: Inventory of District and School Initiatives)

DATA OVERVIEW PROCESS

After completing the *Inventory of District and School Initiatives* activity in the previous section, the Team should be ready to proceed with its inquiry. The next step in the collaborative inquiry process is to share the focusing question and related data with an appropriate audience by creating and presenting a data overview.

The primary objective of a data overview is to enable stakeholders to collaboratively interact with data related to the focusing question in order to generate clarifying questions that will drive the inquiry process forward. These clarifying questions will serve to focus subsequent efforts in data collection and analysis.

To achieve this objective, the District Data Team must build user-friendly data displays that tell a valid and interesting story about the focusing question. The District Data Team must then involve stakeholders in the collaborative analysis of the data and the creation of clarifying questions.

ANATOMY OF A DATA OVERVIEW

The data overview is a presentation (usually accompanied by PowerPoint) designed to introduce to stakeholders preliminary data related to a focusing question.

The specific content of a data overview will vary based on the audience (administrative team, full faculty, department faculty, specialists), but the purpose and structure remain constant. A typical data overview meeting will contain the following sections.

Typical Agenda of a Data Overview Meeting	
Welcome and Introductions	• Outline the data overview presentation so that the audience understands the purpose, structure, and outcomes of the meeting.
	• A quick roll call or introductions so everyone knows who is in the audience, e.g., who here is a teacher, family member, or district administrator.

Purpose	• Clearly state the purpose for the data overview in terms of the focusing question(s) that is being explored.
Data Displays	• Use well-developed data displays that clearly tell a story related to the focusing question(s) and stimulate constructive conversations. • Collectively make factual observations (no inferences) about each data display.
Brainstorming Session	• Formulate hypotheses that might explain the data. • Pose clarifying questions to guide the exploration of the hypotheses. • Identify the kinds of data needed to answer the questions and suggest ways to collect the additional data.
Next Steps	• Discuss next steps, such as action items from the meeting, e.g., who will collect additional data and by when, and the date and time of the next meeting.

When planning a data overview, it is important for the Data Team to consider the audience and context and adjust the presentation accordingly. To do this, the Team might consider:

- What is the level of data literacy of the audience, e.g., principals, teachers, students, families, union representatives, school committee, or community members?

- What questions might these stakeholders already be considering in relation to the focus of inquiry?

- What barriers to data use (from *1.1.1T*) might be relevant to this audience, and how could the data overview help address them?

> **W**hen planning a data overview, it is important for the Data Team to consider the audience and context and adjust the presentation accordingly.

The data overview should result in at least two specific outcomes. The set of clarifying questions developed through the brainstorming protocol and the identification of related data help guide the next steps in the inquiry process. Additionally, as the group engages with the data and formulates hypotheses and clarifying questions, they increase their capacity for inquiry and become invested in the process. This buy-in is critical for subsequent processes and is crucial toward creating a district-wide culture of inquiry.

Activity 2.3 Anatomy of a Data Overview

In this activity, you will review and critique a sample data overview presented by the Scenic Cove District Data Team. Review the PowerPoint presentation and use the *Data Overview Checklist to* determine if all of the essential elements are present. As a District Data Team, discuss how the *Scenic Cove School District ELA Data Overview* could be improved.

(2.3.1T: Data Overview Checklist)
(2.3.2R: Data Overview Example)

PREPARING A DATA OVERVIEW

Building a data overview starts with articulating a focusing question. To prepare, return to the Team's work in *2.1 Question Formulation Protocol*. Select one of the focusing questions the Team developed and identify and gather high-level data necessary to begin exploring it. This focusing question will guide the creation of a data display. By creating a well thought out focusing question, engaging in collaborative discussion around that question, and by skillfully using data, the Team will begin to build a story, and ultimately, this should also help the Team identify and refine the clarifying questions and accompanying data displays.

BUILDING A DATA DISPLAY

At the center of any data overview sit quality data displays. Constructing these displays requires careful thought and effort to ensure that the data are displayed in a way that connect to the focusing question and inspire clarifying questions that will drive deeper inquiry by the audience.

Quality data displays need to:

- Tell the whole story

- Have complete, accurate, and timely data

- Contain all relevant and pertinent data

- Be readable and understandable

Activity 2.4 Building a Data Display

The *Building Data Displays Protocol* enables District Data Team members to apply the principles of data display construction to tell a story related to a focusing question. The *Data Display Rubric* provides a framework for the Team to assess the quality of the data displays it creates. The *Types of Data Displays* and *More Data Display Resources* provide some ideas for different ways that data can be represented.

(2.4.1T: Building Data Displays Protocol)
(2.4.2R: Data Display Rubric)
(2.4.3R: Types of Data Displays)
(2.4.4R: More Data Display Resources)

DESIGNING THE DATA OVERVIEW

Once the data displays are built and designed, the data overview will begin to take shape and the Team will be ready to craft the rest of the presentation. The agenda should follow the model outlined earlier.

▶ Purpose

▶ Agenda

▶ Data displays driven by a focusing question and additional clarifying questions that tell a story

- Make observations about the data (no inferences)

- Record observations on chart paper

▶ Structured brainstorming session
- What might lie behind what the group is seeing in the data? (careful inferences)

- What additional questions does the group have?

- What additional data are needed to answer those questions?

▶ Identify next steps
- What data need to be collected?

- Who will collect it?

- When will a follow-up meeting occur?

Working with the Team, construct a presentation in PowerPoint using the data displays that have been built. It may be helpful to first storyboard the presentation on chart paper with the Team. Return as necessary to *Activities 2.3* and *2.5* to create and refine data displays that support the Team's central theme.

With the data displays freshly made and assessed and the presentation assembled, the Team is ready to engage a larger audience in the inquiry process. Plan the meeting and deliver the data overview that the Team has created.

Activity 2.5 Delivering the Data Overview

These tools will help the Team deliver a data overview and follow up afterwards. The results of this work will lead the Team into *Module 3: Information* and serve as the foundation for the rest of the inquiry cycle throughout this Toolkit.

(2.5.1T: Data Overview Brainstorming Protocol)
(2.5.2T: Focusing Question Investigation Template)

MODULE SUMMARY

This module provides an overview of the Data-Driven Inquiry and Action Cycle, which can serve as the foundation for conducting an inquiry process. It launches the inquiry process by helping a District Data Team formulate a meaningful focusing question that is of high interest to the district and that will guide its inquiry process.

The module includes tools to help a District Data Team build its capacity to design meaningful data displays and present them in an effective data overview to targeted audiences. This approach can help engage stakeholders in the inquiry process, as well as inform the process of generating clarifying questions that refine the focus of the inquiry and identifying the data needed to provide insight on those questions.

A District Data Team should emerge from this stage of the process with clearly articulated focusing and clarifying questions, as well as a list of data it plans to collect and analyze to answer those questions.

Answers to the clarifying questions generated through this process will require the collection and analysis of additional data—the subject of the next module in the District Data Team Toolkit—*Module 3: Information*.

REFERENCES

Sagor, R. (1992). *How to conduct collaborative action research.* Alexandria, VA: Association for Supervision and Curriculum Development (ASCD).

For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

QUESTION FORMULATION PROTOCOL   2.1.1T

Purpose	To formulate a focusing question derived from an issue of importance to your district.	**Related Documents** 2–Inquiry Module
Description	This protocol will help the District Data Team develop, organize, and prioritize questions to structure inquiry.	
Time	About 30 minutes.	

Directions

1. Identify an issue in your district that you as a District Data Team wish to address. Write the issue on the top of a piece of chart paper. It can be formulated as a statement or question. Your issue/question should be related to student outcomes.
   5 minutes

2. As a Team, brainstorm questions that stem from the original question/statement. Write the questions as stated on the chart paper. All items must be phrased as questions. Your questions should be related to student outcomes.
   15 minutes

3. From this group of questions, identify three questions that deal with issues that the district has control over and which, if positively resolved, will have a significant impact on teaching and learning. Out of these three, identify the top priority question.
   10 minutes

4. Your top priority question should serve as the focusing question to initiate the Data-Driven Inquiry and Action Cycle.

Purpose	To identify data sources and help avoid redundancy in relation to district/school initiatives that address the focusing question the District Data Team has decided to investigate.	**Related Documents** 2–Inquiry Module
Description	Districts and schools may have multiple initiatives in place at one time. Adding a new initiative that is potentially related to or has an impact on the focusing question may be redundant if the question is already being effectively addressed by an existing initiative. The *Inventory of District and School Initiatives* will identify current initiatives and will provide data on the effectiveness of the implementation of those initiatives.	
Time	Approximately 1 hour.	

Directions

As a District Data Team, think about the initiatives/programs that are currently part of the improvement efforts in your district. List each initiative/program in the *Inventory of District and School Initiatives* on the following page. For each, provide the information indicated in the columns to the right of the initiative name. The District Data Team may have to call upon others in the district to help provide the required information.

▶ After you have gathered the required data on each initiative, determine which initiative/program(s) is directly related to your focusing question.

▶ For the related initiatives/programs, consult the Effectiveness of Implementation and Desired Outcomes columns (3–5) to determine which appear to be addressing your focusing questions effectively.

▶ If, as a District Data Team, you feel you need to gather more data to determine effectiveness, collect the data and re-evaluate the initiatives.

▶ If the consensus of all relevant parties is that the initiative is achieving the desired result, select a new focusing question. If not, move forward with the inquiry.

Instructions: Think about the initiatives/programs you currently have running as part of the school improvement efforts in your district. Provide information about each initiative in the table below.

District Name:

Inventory of Instructional Initiatives					
		Effectiveness of Implementation and Desired Outcomes			
Name of Instructional Initiative	**Staff Responsible for Implementation**	**Teachers Implementing** **4 = All (100%)** **3 = Most (>75%)** **2 = Some (25–75%)** **1 = Few (<25%)**	**Extent of Implementation** **4 = Complete** **3 = Progressing** **2 = Partially/Weak** **1 = Just beginning**	**Evidence of Desired Outcomes**	**Other Evidence that Would be Helpful to Collect**

DATA OVERVIEW CHECKLIST   2.3.1T

Purpose	To provide the District Data Team with an example of a data overview presentation.
Description	In this activity, you will review and critique a sample data overview presented by the Scenic Cove District Data Team. Review the PowerPoint presentation and use the *Data Overview Checklist* to determine if all of the essential elements are present. As a District Data Team, discuss how the *Scenic Cove School District ELA Data Overview* could be improved.
Time	Approximately 1 hour.

Related Documents
2–Inquiry Module
2.3.2R: Scenic Cove School District ELA Data Overview

DATA OVERVIEW CHECKLIST

District/School Name: _____   **Date:** _____

Format & Structure	Y/N
Does your Data Overview:	
• Identify the audience that will participate in the overview?	
• Have a purpose?	
• Have an agenda?	
• Contain data displays driven by a focusing question?	
• Include a structured brainstorming session?	
• Identify next steps?	
• Will the format and structure of your data overview result in specific outcomes that will move inquiry forward?	
Agenda	**Y/N**
Does your Agenda:	
• State the purpose of the data overview session?	
• List the data displays to be reviewed?	
• List the steps in the brainstorming process?	
• Include identifying next steps?	

Data Displays	Y/N
Do the Data Displays:	
• Contain the attributes of a good chart?	
• Appear free of unnecessary detail and extraneous features?	
• Use the most appropriate chart style to display the data?	
• Tell the story that you want to convey about the data?	
Brainstorming	**Y/N**
Will the structure of the Brainstorming activity result in:	
• The identification of problems evident in the data?	
• The identified problems being listed in priority order?	
• The formulation of hypotheses to explain the problem?	
• Clarifying questions to further direct the inquiry?	
• The identification of additional data needed and potential data sources?	
Next Steps	**Y/N**
Do the identified Next Steps:	
• Logically follow from the outcomes of the brainstorming session?	
• Contain action items?	
• State the date and time of the next meeting?	
• Identify the audience and/or participants in the next meeting?	

DATA OVERVIEW EXAMPLE   2.3.2R

Purpose	To provide the District Data Team with an example of a data overview presentation.	Related Documents
		2–Inquiry Module 2.3.1T: Data Overview Checklist
Description	In this activity, you will review and critique a sample data overview presented by the Scenic Cove District Data Team. Review the PowerPoint presentation and use the *Data Overview Checklist* to determine if all of the essential elements are present. As a District Data Team, discuss how the *Scenic Cove School District ELA Data Overview* could be improved.	
Time	Approximately 1 hour.	

Scenic Cove School District

Data Overview Presentation, September 2009

Presented by the District Data Team

Agenda

1. Purpose of this presentation

2. Presentation of relevant data displays

3. Collaboratively brainstorm to:

   - Identify and prioritize a problem evident in the data

   - Formulate hypotheses to explain the problem

   - Generate clarifying questions to direct further inquiry

   - Identify additional data needed and potential data sources

4. Discuss next steps

The Issues

- The academic performance of English language learners (ELLs) in the Scenic Cove School District is lower than the statewide population of ELLs at several grade levels on 2009 MCAS English Language Arts (ELA) tests.

- The academic performance of ELLs in the district lags behind their native English-speaking peers.

- The academic performance of ELLs in the district falls below established NCLB performance and improvement targets.

Purpose

To begin the process of collaborative inquiry that will address the focusing questions:

1. What does the performance of ELLs in the district look like over time on MCAS ELA tests?

2. How does the performance of ELLs in the district compare to that of ELLs state-wide on the 2009 MCAS ELA test?

3. Why is the performance of ELLs in some grades closer to the state average than others on the 2009 MCAS ELA test?

4. What is the performance of ELLs in targeted grades in district schools on the 2009 MCAS ELA test?

5. How does the performance of ELLs in the district compare to the state on the 2009 MEPA test?
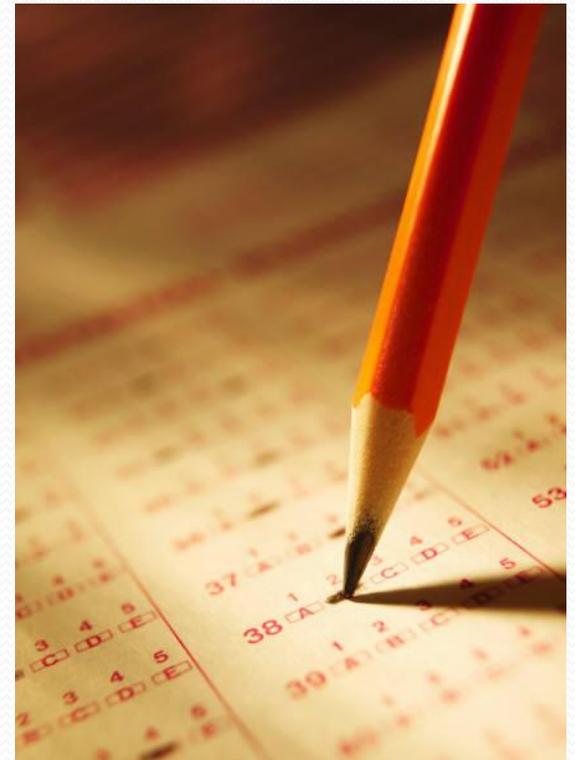
What does the performance of ELLs in the district look like over time on MCAS ELA tests?

Source: Data Warehouse > Public Folders > ESE Cubes > MCAS Official Release 2009

Tests Administered as values		2006	2007	2008	2009	2006–2009 Change
3	A/P	25.3%	23.3%	31.5%	27.1%	1.8%
	NI	51.6%	47.8%	41.6%	38.6%	-13.0%
	W/F	23.2%	28.9%	27.0%	34.3%	11.1%
4	A/P	3.7%	11.5%	11.8%	14.6%	10.9%
	NI	53.2%	39.7%	38.2%	43.9%	-9.3%
	W/F	43.1%	48.7%	50.0%	41.5%	-1.6%
5	A/P	2.6%	8.0%	1.7%	9.6%	7%
	NI	40.2%	27.6%	14.8%	33.7%	-6.5%
	W/F	57.3%	64.4%	83.5%	56.6%	-0.7%
6	A/P	5.0%	6.3%	15.9%	11.5%	6.5%
	NI	26.7%	33.3%	36.5%	32.8%	6.1%
	W/F	68.3%	60.3%	47.6%	55.7%	-12.6%
7	A/P	10.0%	1.5%	9.4%	9.7%	-0.3%
	NI	20.0%	27.3%	25.0%	29.2%	9.2%
	W/F	70.0%	71.2%	65.6%	61.1%	-8.9%
8	A/P	4.5%	7.8%	7.4%	7.8%	3.3%
	NI	22.7%	18.9%	25.3%	20.7%	-2.0%
	W/F	72.7%	73.3%	67.4%	71.6%	-1.1%
10	A/P	16.3%	4.7%	5.9%	3.0%	-13.3%
	NI	46.5%	31.3%	35.3%	19.7%	-26.8%
	W/F	37.2%	64.1%	58.8%	77.3%	40.1%

2.3.2R: Data Overview Example—Version 1.0

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How does the performance of ELLs in the district compare to that of ELLs state-wide on the 2009 MCAS ELA test?

Source: Data Warehouse > Public Folders > ESE Cubes > MCAS Official Release 2009

Tests Administered as values		District	State	Difference
		2009	**2009**	
3 **(N = 70)**	*A/P*	*27.1%*	*26.2%*	*0.9%*
	NI	*38.6%*	*40.7%*	*-2.1%*
	W/F	*34.3%*	*33.0%*	*1.3%*
4 **(N = 82)**	*A/P*	*14.6%*	*18.0%*	*-3.4%*
	NI	*43.9%*	*46.8%*	*-2.9%*
	W/F	*41.5%*	*35.2%*	*6.3%*
5 **(N = 83)**	*A/P*	*9.6%*	*16.3%*	*-6.7%*
	NI	*33.7%*	*40.5%*	*-6.8%*
	W/F	*56.6%*	*43.2%*	*13.4%*
6 **(N = 61)**	*A/P*	*11.5%*	*18.7%*	*-7.2%*
	NI	*32.8%*	*34.3%*	*-1.5%*
	W/F	*55.7%*	*47.0%*	*8.7%*
7 **(N = 72)**	*A/P*	*9.7%*	*13.1%*	*-3.4%*
	NI	*29.2%*	*34.7%*	*-5.5%*
	W/F	*61.1%*	*52.2%*	*8.9%*
8 **(N = 116)**	*A/P*	*7.8%*	*12.9%*	*-5.1%*
	NI	*20.7%*	*27.0%*	*-6.3%*
	W/F	*71.6%*	*60.1%*	*11.5%*
10 **(N = 66)**	*A/P*	*3.0%*	*21.8%*	*-18.8%*
	NI	*19.7%*	*36.8%*	*-17.1%*
	W/F	*77.3%*	*41.4%*	*35.9%*

2.3.2R: Data Overview Example—Version 1.0

Why is the performance of ELLs in some grades closer to the state average than others on the 2009 MCAS ELA test?

Source: Data Warehouse > Public Folders > ESE Cubes > MCAS Official Release 2009

Tests Administered as values		District 2009	State 2009	Difference
3 (N = 70)	A/P	27.1%	26.2%	0.9%
	NI	38.6%	40.7%	-2.1%
	W/F	34.3%	33.0%	1.3%
4 (N = 82)	A/P	14.6%	18.0%	-3.4%
	NI	43.9%	46.8%	-2.9%
	W/F	41.5%	35.2%	6.3%
5 (N = 83)	A/P	9.6%	16.3%	-6.7%
	NI	33.7%	40.5%	-6.8%
	W/F	56.6%	43.2%	13.4%
6 (N = 61)	A/P	11.5%	18.7%	-7.2%
	NI	32.8%	34.3%	-1.5%
	W/F	55.7%	47.0%	8.7%
7 (N = 72)	A/P	9.7%	13.1%	-3.4%
	NI	29.2%	34.7%	-5.5%
	W/F	61.1%	52.2%	8.9%
8 (N = 116)	A/P	7.8%	12.9%	-5.1%
	NI	20.7%	27.0%	-6.3%
	W/F	71.6%	60.1%	11.5%
10 (N = 66)	A/P	3.0%	21.8%	-18.8%
	NI	19.7%	36.8%	-17.1%
	W/F	77.3%	41.4%	35.9%

What is the performance of ELLs in targeted grades in district schools on the 2009 MCAS ELA test?*

Tests Administered as Values		Sea Breeze ES	Sea Gull ES	Golden Sands ES	Rip Tide ES	Coral ES
		2009	2009	2009	2009	2009
3	N	4	21	0	0	32
	A/P	100.0%	23.8%			21.9%
	NI	0.0%	23.8%			56.3%
	W/F	0.0%	52.4%			21.9%
4	N	6	2	4	2	49
	A/P	16.7%	0.0%	0.0%	0.0%	18.4%
	NI	83.3%	0.0%	100.0%	100.0%	34.7%
	W/F	0.0%	100.0%	0.0%	0.0%	46.9%
5	N	3	5	15	42	0
	A/P	100.0%	0.0%	0.0%	2.4%	
	NI	0.0%	0.0%	60.0%	31.0%	
	W/F	0.0%	100.0%	40.0%	66.7%	

*Minimum 10 Students
Source: Data Warehouse > Public Folders > ESE Cubes > MCAS Official Release 2009

What is the performance of ELLs in targeted grades in district schools on the 2009 MCAS ELA test?*

Tests Administered as Values		Coastal MS	Rock MS
		2009	2009
6	N	53	8
	A/P	13.2%	
	NI	34.0%	25.0%
	W/F	52.8%	75.0%
7	N	70	2
	A/P	10.0%	
	NI	30.0%	
	W/F	60.0%	100.0%
8	N	95	18
	A/P	2.1%	27.8%
	NI	20.0%	22.2%
	W/F	77.9%	50.0%

*Minimum 10 Students
Source: Data Warehouse > Public Folders > ESE Cubes > MCAS Official Release 2009

2.3.2R: Data Overview Example—Version 1.0

What is the performance of ELLs in targeted grades in district schools on the 2009 MCAS ELA test?*

Tests Administered as values		Ebb Tide HS
		2009
10	*N*	66
	A/P	*3.0%*
	NI	*19.7%*
	W/F	*77.3%*

*Minimum 10 Students
Source: Data Warehouse > Public Folders > ESE Cubes > MCAS
Official Release 2009

Spring 2009 MEPA Results:
Percentage of Students at Each Performance Level by Years of Enrollment in the State and Scenic Cove

Category	Level 1	Level 2	Level 3	Level 4	Level 5
All Students - State	4	6	21	48	20
All Students - SC	20	18	32	23	7
First Year - State	32	22	21	21	4
First Year - SC	45	23	22	6	3
Second Year - State	5	15	30	37	13
Second Year - SC	10	19	34	27	10
Third Year - State	1	7	26	51	15
Third Year - SC	4	16	38	35	8
Fourth Year - State	1	3	21	55	20
Fourth Year - SC	3	6	38	38	16
Fifth Year or More - State	1	2	17	52	28
Fifth Year or More - SC	7	10	45	38	0

Source: Massachusetts English Proficiency Assessment (MEPA) Statewide Results: Spring 2009; Spring 2009 MEPA Results by District
http://www.doe.mass.edu/mcas/mepa/results.html

2.3.2R: Data Overview Example—Version 1.0

Brainstorm Groups

Group A	Group B	Group C	Group D
Jerry	Jill	Colleen	Kerry
Maria	Saleem	Michelle	Alex
Jose	Jeff	Clarence	Jordan
Roger	Patricia	Cindy	Ann

Brainstorm!

Purpose	To collaboratively investigate the focusing question.
What you will do?	Using the *Data Overview Brainstorming Protocol*, you will make observations, identify problems, form hypotheses, and craft clarifying questions related to the focusing question.
Estimated Time	About 30 minutes.

Next Steps

- What additional data do we need to collect?

- Who will collect the data?

- How will the data be collected?

- When will we have collected the data?

- Who will analyze the data?

- What materials should we have for the next meeting?

- Next meeting date and time?

BUILDING DATA DISPLAYS PROTOCOL   2.4.1T

		Related Documents
Purpose	To build data displays based on data related to the focusing question.	2–Inquiry Module 2.4.2R: Data Display Rubric 2.4.3R: Types of Data Displays 2.4.4R: More Data Display Resources
Description	This activity enables District Data Team members to apply the principles of data display construction to tell a story related to the focusing question.	
Time	Approximately 1 hour.	

During this activity, the District Data Team will work collaboratively to create a strong data display for the selected focusing question. Before beginning, review and become familiar with the related tools and resources listed above. These should be used each time you prepare a data display.

Directions

1. As a District Data Team, restate the focusing question you crafted in *2.1.1.T: Question Formulation Protocol* and post it for all to see.

    For example: How did the achievement of the population of English language learners vary across all schools in the Scenic Cove School District?

2. Examine a few sources of high-level district data, such as MCAS/AYP reports or student growth data. Think individually, then discuss as a Team: *What do you see in the data that relates to the focusing question?* As a Team, brainstorm and chart the collective observations for all to see. Be sure to make only factual observations and interpretations about what the data appear to say—don't make inferences from the data.

3. Each member of the District Data Team should now sketch on a piece of chart paper a data display that illustrates what s/he thinks are the most important observations. Refer to *2.4.3R: Types of Data Displays* for guidance regarding the construction of data displays. Post the data displays for the whole District Data Team to review.

Note: This next section works best in groups of 3–4.

4. Each District Data Team member should present one data display to the balance of the Team or to one of the small groups. Number the data displays to identify them later.

5. Each presenter should ask group members what they see in the data (observations, not inferences). Presenters should record observations on chart paper for each display. (5–10 minutes).

6. Then each member should explain to the group:
    *   Why s/he chose a particular display type
    *   What story s/he wanted to tell with the display that s/he selected
    *   What clarifying questions the display elicits for him/her (5–10 minutes)

7. After each presentation, each person fills out the *Data Display Rubric* for each data display, including the presenters.

8. Repeat this process until all have presented his or her display.

9. Think individually and discus as a Team: *How do the sketches compare?* Be sure to record answers for future reference.

10. Regroup as a District Data Team. Review the feedback on each data display. Spend about 5–10 minutes digesting and summarizing the feedback. Note common themes across data displays. Discuss the various sketches that Team members created and reach consensus as a District Data Team on the data displays that best communicate the story to be told about the data.

11. Save all of the sketches for future reference.

Alternative Approach

1. Have District Data Team members work in pairs to collaboratively develop each data display.

2. Often there is more than one story to be told by a set of data. See how many different valid and interesting stories about the data can be told using different data displays.

DATA DISPLAY RUBRIC   2.4.2R

Purpose	To assess the quality of data displays and gain feedback to improve them.
Description	This rubric can be used to assess the quality of a data display. It can be used with the *Data Display Feedback Protocol* to gain group input, or can be used as a tool for individual reflection.
Time	15 minutes.

Related Documents
2–Inquiry Module
2.4.1T: Building Data
        Displays Protocol
2.4.3R: Types of Data
        Displays
2.4.4R: More Data Display
        Resources

Focusing Question Driving the Data Display: _____

_____

Data Display Number: _____

Use the scale provided below to rate each of the following statements about the data display.

4 = Excellent: No change needed   **3** = Good: Some changes needed   **2** = OK: Moderate changes should be made   **1** = Not So Good: Needs extensive rework

	Question	Rating	Comments
1.	The data display contains attributes of an effective data display: all axes are labeled and the display includes an informative title; population assessed; number and percent of students; subject and test; and when they were assessed.		
2.	The data display is uncluttered and free of unnecessary detail and extraneous features.		
3.	The data display uses an appropriate choice of chart style, e.g., clustered bar chart, correlation chart, scatter chart.		

Answer the following questions with an open response.

	Question	Response
4.	What do you like about this data display?	
5.	Is there anything that makes it difficult to understand?	
6.	What are some concrete suggestions that could make this display more effective or easier to understand?	

TYPES OF DATA DISPLAYS   2.4.3R

Purpose	To understand various types of data displays and their potential uses.	**Related Documents** 2–Inquiry Module 2.4.1T: Building Data Displays Protocol 2.4.2R: Data Display Rubric 2.4.4R: More Data Display Resources
Description	This resource can help a Team choose data displays that will be most useful for engaging in thoughtful data analysis or communication with stakeholders.	
Time	Ongoing.	

Simple Bar Chart

A simple bar chart shows a frequency distribution for a single variable, e.g., percent Proficient,

on a specific measure for components within a single category, e.g., grade-level populations. Each bar displays the results for each individual category component (as opposed to relative distribution, as in a pie chart). A simple bar chart can answer questions such as:

- What percent of students in each grade level achieved Proficiency for a particular school year?

- How do the results for one population subgroup compare to those of other subgroups?
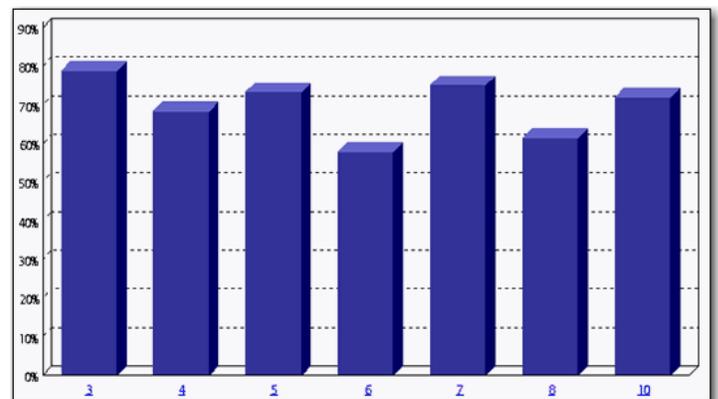
Clustered Bar Chart
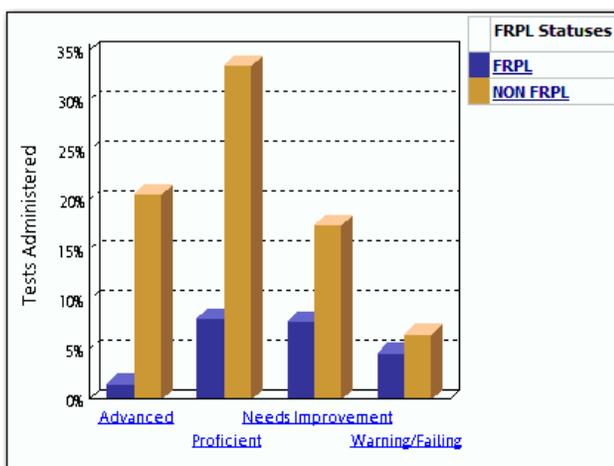
A clustered bar chart allows you to disaggregate data by a category or subgroup. For example, you would use a clustered bar to look at performance across years, between subgroups of students, e.g., gender, lunch status, or across grades. A clustered bar chart can answer questions such as:

- How did students who are eligible for free- or reduced-price lunch (FRPL) perform compared to students who are not?

- Which grade level achieved the highest percentage of correct items? The lowest?

- What was the performance of our students across subject areas or strands?

- What subject or curriculum areas show the greatest need for improvement?

Stacked Bar Chart

A stacked bar chart allows you to see the trend across a given category (performance category in this example), and then within each category component. It allows you to see the relative distribution of results across another category, e.g., FRPL.

A stacked bar chart can be oriented on the vertical or horizontal axis.
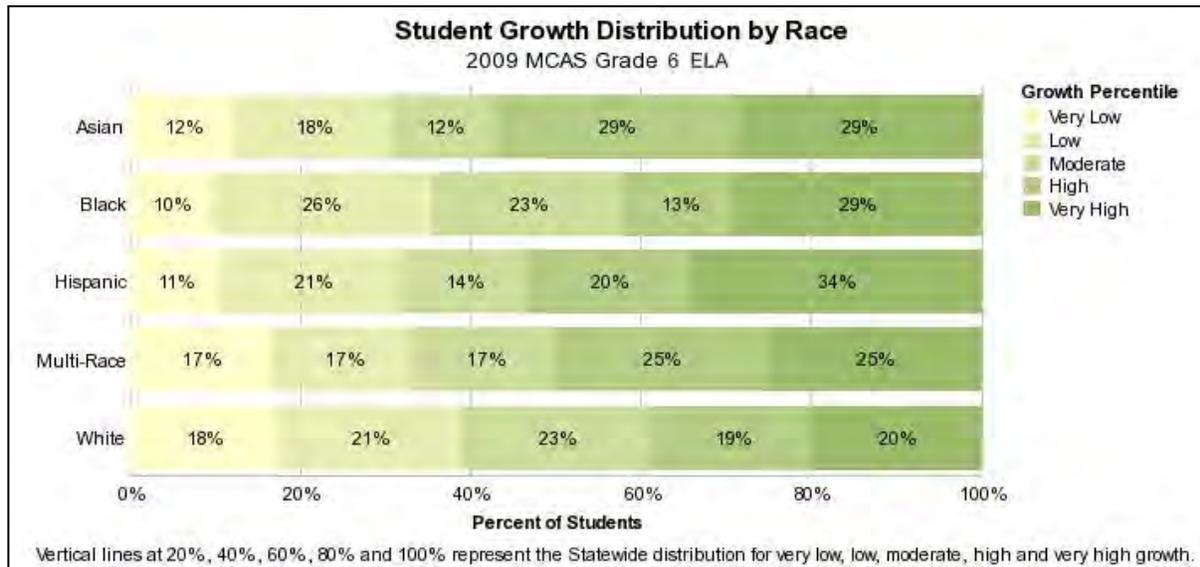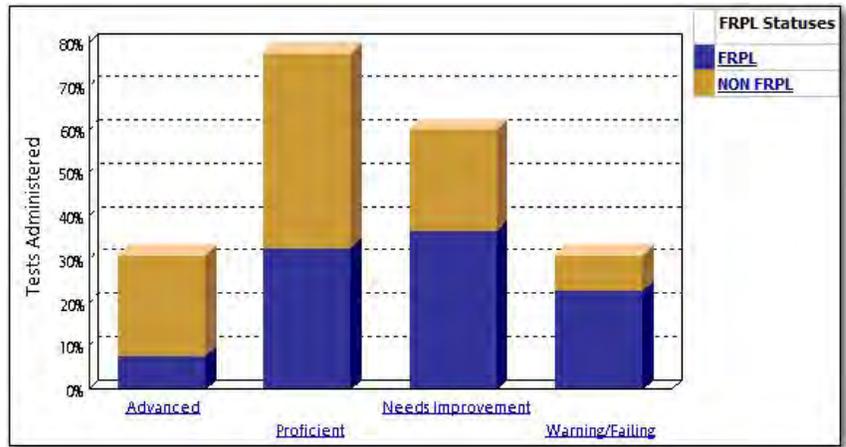
Either form of stacked bar chart can help answer questions such as:

- Which performance category has the highest concentration of students receiving FRPL?
- Which grade level has the highest concentration of lower-performing students?

Simple Line Chart

A simple line chart is similar to a simple bar chart, except the data are represented with a line rather than a bar. Some people like to use line charts when representing data across a time scale (as in the example). Some prefer to use line charts only when the data represent the same group of students over time (a cohort) because the line suggests movement.

A simple line chart can help answer questions such as:

- What are the CPI results for the fourth grade for the last six years?
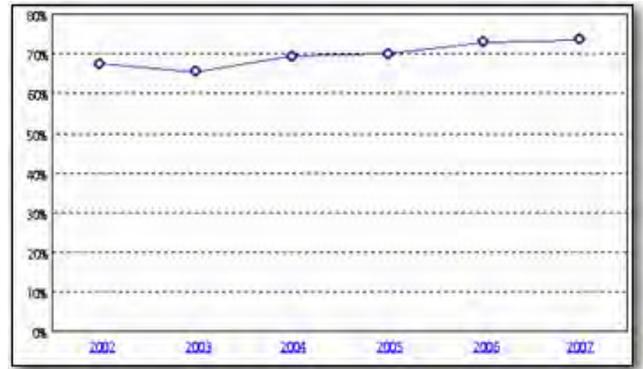
Multiline Chart

A multiline chart is similar to a clustered bar chart, except that the data are represented with lines rather than bars. As with the single line chart, some people like to use multiline charts when representing data across a time scale (as in the example).

A multiline chart can help answer questions like:

- Are we closing the achievement gap between two student groups over time?
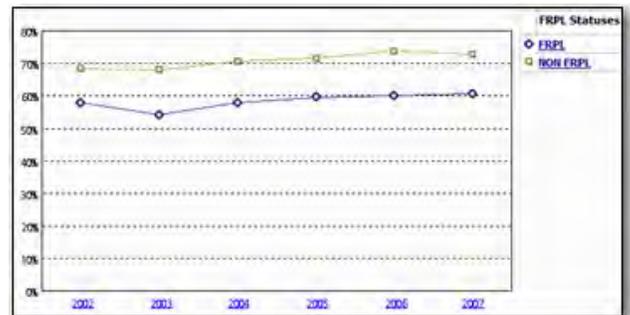
Correlation Chart
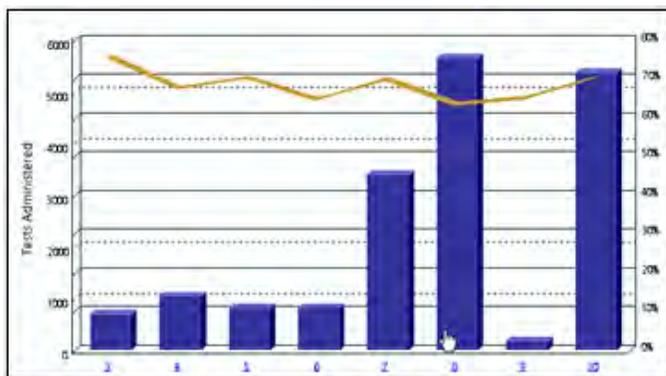
A correlation chart allows you to examine the relationship between two different measures using two different Y axes. The first measure appears as a bar chart whose scale is on the left Y axis. The second measure appears as a line chart whose scale is on the right Y axis.

A correlation chart allows you to answer questions such as:

- What is the distribution of % Correct compared to the number of tests administered across grade levels?
- What is the relationship between the number of correct items and the number of possible items?

Scatter Chart (or Bubble Chart)

A scatter chart allows you to look at the relationship between two different measures using the X and Y axes. The first measure is represented on the Y axis, and the second measure is represented on the X axis. In the sample graph to the right, each circle represents one student. In the sample graph below, each circle represents one school.

A scatter chart can help answer questions such as:

Student Growth by Low Income Status
2009 MCAS Grade 6 English

- What is the relationship between a student's scaled MCAS score and his or her student growth percentile?

- What is the correlation between local district assessments (or grades) and state assessment scores?
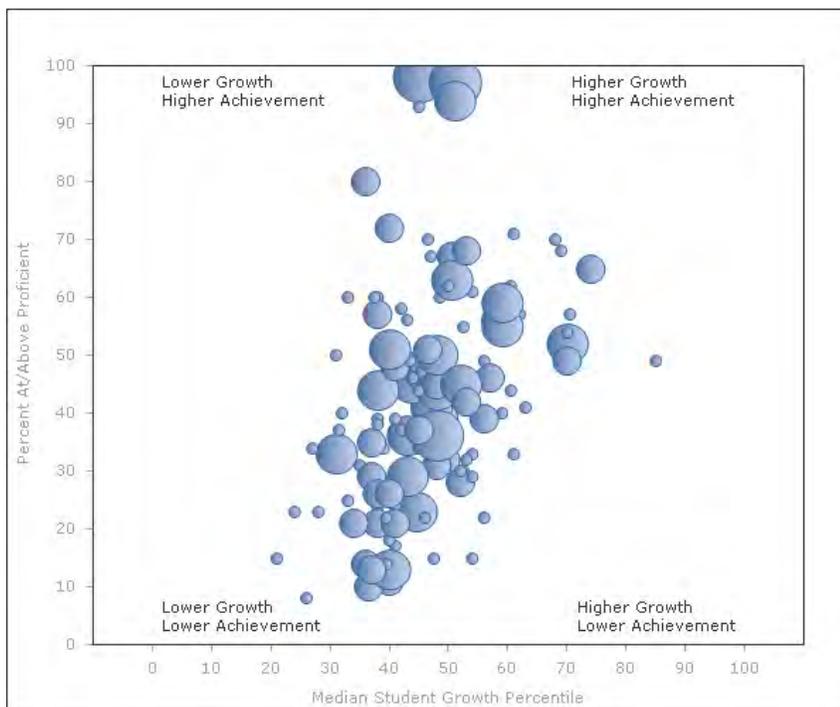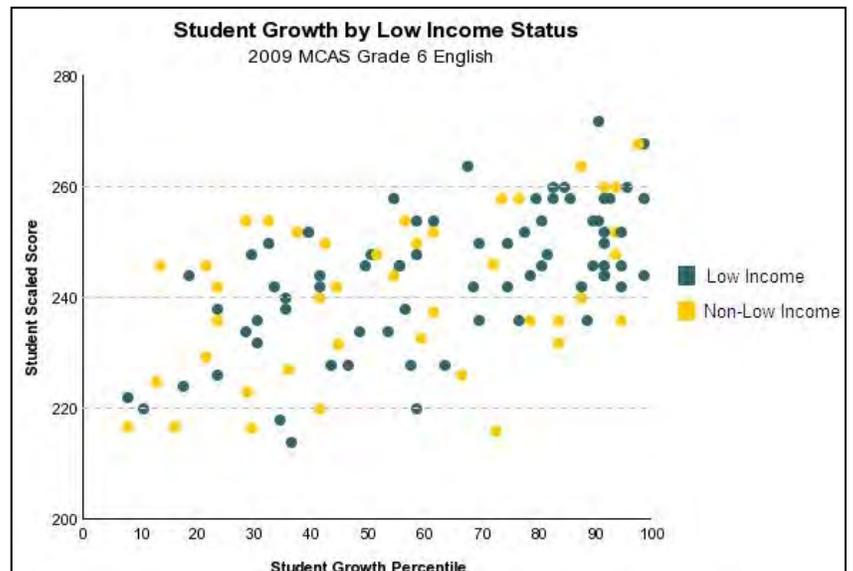
A third dimension of information can be added by using different colors or sizes to differentiate the data points. For example, different colors can distinguish membership in different groups, e.g., income status in the chart above. Different size points can show values, such as the age of the individual, years of service, or number of members, e.g., size of school in the chart below. Adding this third level of data can be valuable for answering questions such as:

- Is there a relationship between income status and performance?

- Is there a correlation between the size of a school and student proficiency and growth rates?

Scatter charts are usually accompanied by a table that summarizes the data and helps label each individual point. Because each point represents a person or group (such as a school), individuals can engage with the chart by locating themselves in the chart and asking:

- Where do I (or my school, or my student) fall in relation to others?

Radar Chart (or Spider Graph)

A radar chart, also known as a spider chart or a star chart because of its appearance, plots the values of several measures along a separate axis that starts in the center of the chart and ends on the outer ring. This makes it possible to compare data across measures. Data that are consistent across all of the measures will be displayed in a near circle. Data that are higher in some measures than others will be displayed in a more free form shape.

A radar chart can help answer a question such as:

- How does student performance on one strand of a test compare to several other strands?

Strengths by Steps

Consumers of data should be familiar with these last two types of data displays. However, in general there are more informative ways to display data. These types of displays are rarely, if ever, used in the Department's Education Data Warehouse.

Pie Chart

A pie chart shows part-to-whole relationships. Pie charts show the relative distribution of performance for a specific population across performance categories, which sum to 100%.

Pie charts can answer questions such as:

- What was the relative distribution of student scores across performance levels for a specific subgroup?

- Which subgroup had the highest proportion of students achieving Proficiency?
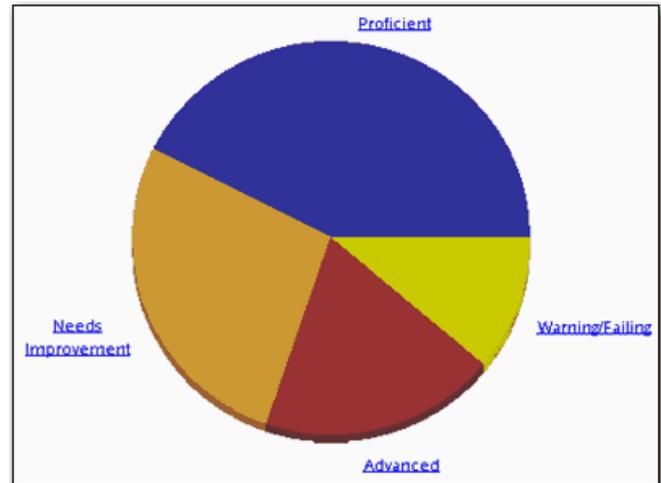
3D Bar Chart

A 3D bar chart is helpful when you want to visually represent a data set across multiple categories. It allows you to see the relationships and trends in a data set across three dimensions.
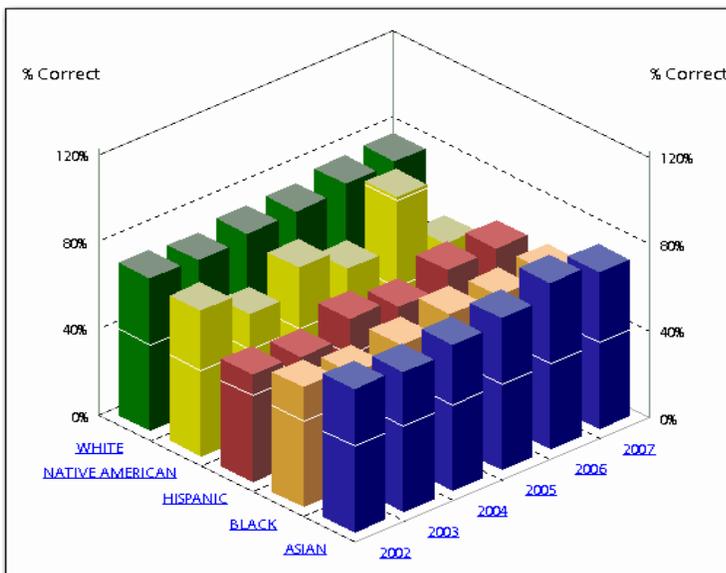
A 3D bar chart allows you to answer questions such as:

- Where are our greatest achievement gaps?

- What do year-to-year trends tell us about the learning needs of different subgroups of students?

- In which subject areas and grade levels do we have the greatest concentration of lower performing students?

MORE DATA DISPLAY RESOURCES   **2.4.4R**

Purpose	To connect districts to additional resources on creating effective data displays.
Description	This list can serve as a starting place for learning more about how to display data in meaningful ways.
Time	N/A.

Related Documents
2–Inquiry Module
2.4.1T: Building Data
        Displays Protocol
2.4.2R: Data Display Rubric
2.4.3R: Types of Data
        Displays

	Website	Brief Description
1	http://nces.ed.gov/forum/publications.asp	The **National Forum on Education Statistics** develops free resources on a variety of issues that affect schools, school districts, and state education agencies." A number of these documents are available for download at this website.
2	http://www.perceptualedge.com/files/GraphDesignIQ.html	**Perceptual Edge**, founded by Stephen Few, is a company that was established to help organizations like yours learn to design simple information displays for effective analysis and communication." This short IQ test can help you determine how well you understand the principles of good table and graph design."
3	http://www.perceptualedge.com/articles/ie/the_right_graph.pdf	**Selecting the Right Graph for Your Message.** In this article, Stephen Few outlines some general principles that can be applied to a wide range of data displays. He presents seven quantitative message types, along with brief descriptions and examples.
4	http://nces.ed.gov/forum/pdf/NCES_table_design.pdf	**Table and Graph Design for Enlightening Communication** is a very long but informative PowerPoint that was presented by Stephen Few at the National Forum on Education Statistics' Summer 2009 Forum on Education Statistics. Mr. Few offered three fundamental steps in the table and graph design process: 1. Determine your *message*. 2. Select the best *medium* to display your message. 3. Design all components of the display to *show the data."* The PowerPoint addresses several points: **Page** **Topic** 1–12 Context 13–36 Examples of Good and Bad Graphs 37–41 Grice's Maxims: Quantity, Quality, Relevance, Manner 42–48 Fundamentals of Data Presentation 49–67 Transforming a Poor Graph 68–79 Parts of Displays 80–92 Design Principles 93–102 Table Design 103–178 Graph Design

DATA OVERVIEW BRAINSTORMING PROTOCOL 2.5.1T

Purpose	To provide a structure that enables all members of the target audience to become familiar with the focusing question, engage with relevant data, and help further the inquiry process.
Description	Use this protocol to facilitate the center of your data overview presentation. The brainstorming activity provides an opportunity for the target audience to collaboratively interact with the data displays associated with the focusing question. Through this collaborative inquiry, the audience will identify problems revealed by the data, develop hypotheses about the cause of the problem, craft clarifying questions to extend the inquiry process, and identify data needed to address those questions.
Time	30–45 minutes.

Related Documents
2–Inquiry Module
2.5.2T: Focusing Question Investigation Template

Directions

Divide the target audience into groups of 4–5 people. Provide sticky note pads, chart paper, markers, and large copies of the data displays for each group. Provide a facilitator for each group.

1. Write the focusing question on the top of a sheet of chart paper. Check to make sure each person understands the question.

2. Post the large copy of the data display (or displays) for the group to view. These may have been created in *2.4.1T: Building Data Displays Protocol.*

3. Ask individuals to silently observe the data and record objective, factual observations about what the data say in the data display. Ensure that all have adequate time to process the information and ask clarifying questions if necessary.

4. Ask individuals to share their observations with the group. Record the observations on chart paper with the focusing question next to the display. Highlight observations that represent ―problems" revealed by the data.

5. On a new sheet of chart paper, the group should write the title–Hypotheses about Possible Causes. They then brainstorm hypotheses about the causes of the ―problem(s)" revealed by the data and record them on the chart paper.

6. As a group, then write the title—Clarifying Questions—at the top of a new sheet of chart paper.

7. Each group member should write one or more clarifying questions that stem from the ―problem(s)" identified by the group on a sticky note (one question per note). Place the sticky notes on the Clarifying Questions chart paper.

8. As a group, review the questions and group similar questions together if possible. Develop a title for each group such as: Questions about Achievement; Questions about Relationships among Variables; etc.

9. Reach consensus on the clarifying questions that seem most appropriate to move the inquiry deeper. Record these questions on a new piece of chart paper. Leave room between questions on the chart paper, or put each question on a separate page.

10. Under each question, identify the evidence (data elements) that needs to be collected to address each of the clarifying questions. If possible, note where each piece of data can be found and how it can be collected.

11. Share the clarifying questions and additional data elements needed with the whole group. The District Data Team will record the questions and data elements on a sheet of chart paper for the whole group to see.

12. Use template *2.5.2T: Focusing Question Investigation Template* to record the key ideas for future reference.

Note: The District Data Team may choose to close the meeting at this point, or the Team may ask the group to help prioritize the clarifying questions that would be most useful and meaningful to extend the inquiry process. Either way, the Team should clarify next steps for how the inquiry process will move forward, and how the stakeholders in attendance at this data overview may be impacted.

FOCUSING QUESTION INVESTIGATION TEMPLATE 2.5.2T

Purpose	To capture the results from the delivery of your data overview presentation.
Description	Use this template as soon after the delivery of the data overview as possible to record the key clarifying questions and other ideas it generated. This template can then be shared with stakeholder groups in the district as work proceeds around data collection.
Time	About 30 minutes.

Related Documents
2–Inquiry Module
2.5.1T: Data Overview Brainstorming Protocol

Focusing Question

Hypothesized "Problem(s)" Discovered Through a Review of High-Level Data

1.

2.

3.

4.

Clarifying Questions Related to these "Problems"
1.

2.

3.

4.

Identifying Data Elements Needed:

Begin by referencing the notes from the data overview regarding the data needed to inform each of the clarifying questions in your inquiry. For each clarifying question, list below the data elements the district will need in order to address the question. For each data element, list which domain of data the element represents and whether it is currently collected and accessible to the Team. If the Team has completed *1.5.1T: Data Inventory Template,* it might want to use it for reference, as well as *1.5.2R: ESE Data Resources*. If the data needed to continue your inquiry is not currently being collected or is not readily accessible, indicate your plan to acquire the required data.

Clarifying Question #1:_____

Data Elements Needed to Address the Clarifying Question	Domain Demographics, Perceptions, Processes, or Student Outcomes	Ease of Access* 1–4, or N/A	Plan to Acquire Required Data Elements (If level of Access is 1–2 or N/A)
(add more rows as needed)			

*__Access__ refers to the degree to which the data are available to District Data Team members. Rate Access on a scale of 1–4 (1 = hard to access; 4 = easily accessible) or N/A if the needed data element is not currently being collected.

Clarifying Question #2:_____

Data Elements Needed to Address the Clarifying Question	Domain Demographics, Perceptions, Processes, or Student Outcomes	Ease of Access* 1–4, or N/A	Plan to Acquire Required Data Elements (If level of Access is 1–2 or N/A)
(add more rows as needed)			

*__Access__ refers to the degree to which the data are available to District Data Team members. Rate Access on a scale of 1–4 (1 = hard to access; 4 = easily accessible) or N/A if the needed data element is not currently being collected.

Clarifying Question #3:_____

Data Elements Needed to Address the Clarifying Question	Domain Demographics, Perceptions, Processes, or Student Outcomes	Ease of Access* 1–4, or N/A	Plan to Acquire Required Data Elements (If level of Access is 1–2 or N/A)
(add more rows as needed)			

*__Access__ refers to the degree to which the data are available to District Data Team members. Rate Access on a scale of 1–4 (1 = hard to access; 4 = easily accessible) or N/A if the needed data element is not currently being collected.

Clarifying Question #4:_____

Data Elements Needed to Address the Clarifying Question	Domain Demographics, Perceptions, Processes, or Student Outcomes	Ease of Access* 1–4, or N/A	Plan to Acquire Required Data Elements (If level of Access is 1–2 or N/A)
(add more rows as needed)			

*__Access__ refers to the degree to which the data are available to District Data Team members. Rate Access on a scale of 1–4 (1 = hard to access; 4 = easily accessible) or N/A if the needed data element is not currently being collected.

Massachusetts Department of
ELEMENTARY & SECONDARY
EDUCATION

District Data Team Toolkit

MODULE 3: INFORMATION

Table of Contents

Tools and Resources for Information

3.1.1T: Data Collection Planning Tool	Also revisit tools from *Inquiry:*
3.2.1T: Practice Making Valid Inferences	2.4.1T: Building Data Displays Protocol
3.3.1T: Data Analysis Protocol	2.4.2R: Data Display Rubric
	2.4.3R: Types of Data Displays
	2.4.4R: More Data Display Resources

INTRODUCTION

WHERE ARE WE NOW?

The District Data Team Toolkit is based on the Data-Driven Inquiry and Action Cycle. The Cycle provides the structure that takes data use within the district from asking the right questions to getting results. It is an iterative process in which the district acts on data to support continuous improvement. The Toolkit uses the steps of the Cycle to structure a progression through the model—you are now in *Module 3: Information*.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Getting Ready	Inquiry	Information	Knowledge	Action	Results

Raw data alone does not support the inquiry process. Central to turning raw data into information is the process of data analysis. The *Information* module can help a District Data Team build its capacity to analyze data by considering the appropriate use of assessment results and the formation of valid inferences.

Through the data overview process introduced in the *Inquiry* module, the District Data Team identified the data needed to move the inquiry process forward. Next the Team must collect and organize the data in order to be poised to analyze the data and make meaning from them.

MODULE OBJECTIVES

The **Information** module will help a District Data Team:

▶ Collect and organize data relevant to the inquiry process

▶ Distinguish between observations and inferences

▶ Make inferences from multiple sources of data

PREPARING DATA FOR ANALYSIS

At this stage of the process, the District Data Team should develop a list of data needed to address the clarifying questions related to its focus of inquiry. Now the Team must actually collect the data and organize these in a meaningful way that promotes rigorous analysis. The *Focusing Questions Investigation Template (2.5.2T)* and the *Data Inventory Template (1.5.1T)* can be useful in taking this next step.

Activity 3.1 Data Collection

This tool will help guide the collection of specific data needed to answer a focusing question and related clarifying questions.

(3.1.1T: Data Collection Planning Tool)

Once data are collected, the Team will want to display the data in a meaningful way that prompts curiosity and allows viewers to make comparisons and inferences about causality. Displays should show as much information as possible in as small an area as possible, without any distractions or extraneous information. The *Inquiry* module introduced a variety of data displays that may be useful for the Team to revisit at this stage in the process. In addition, the Team may want to consider the following questions:

- Do the displays highlight contrasts and differences?

- Do they show multiple factors?

- Is evidence from different sources integrated?

- Is the data of high quality and integrity?

- Is it relevant to the questions being investigated?

- Are displays laid out so important comparisons are in the same page or eye span? (It's best not to have to turn pages to compare data)[1]

REVISIT 2.4 Building a Data Display

These tools were first introduced in *Module 2: Inquiry*, but may be useful at this stage of the process.

The *Building Data Displays Protocol* enables District Data Team members to apply the principles of data display construction to tell a story related to a focusing question. The *Data Display Rubric* provides a framework for the Team to assess the quality of the data displays it creates. The *Types of Data Displays* and *More Data Display Resources* provide some ideas for different ways that data can be represented.

(2.4.1T: Building Data Displays Protocol)
(2.4.2R: Data Display Rubric)
(2.4.3R: Types of Data Displays)
(2.4.4R: More Data Display Resources)

ANALYZING DATA

A thoughtful and rigorous analysis of data is key to a successful inquiry process. It can be easy to unknowingly approach data with the answer already in our minds, consciously or unconsciously seeking evidence that supports what we already believe to be true. Approaching data with a truly open mind takes practice and discipline.

> **A**pproaching data with a truly open mind takes practice and discipline.

The first step in data analysis, as described in the data overview process in the *Inquiry* module, is the objective description of what the data say. What patterns and trends are evident in the data? It is very important to focus on this first step before making inferences or drawing conclusions from the data, because clarifying questions often need to be posed and additional data collected before valid inferences can be made. Colleagues on a District Data Team can play an important role in helping each other use language that is as specific and objective as possible when discussing information and data. For example, helping each other distinguish between observations and inferences:

Observation: Factual interpretations and statements about quantities, e.g., "Over half the principals report…"; the presence of specific information and/or numerical relationships between ideas, e.g., "Over 90% of the district's schools have teams…"; or patterns, e.g., "most principals report that their teams are focused on…" An observation captures an unarguable fact and may be indicated by phrases such as *I observe that…, some patterns/trends that I notice…,* or *I am surprised to see...*

Example: About one third of our students performed below proficient in mathematics.

Inference: A conclusion, explanation, or conjecture that is drawn from a data set, such as using a smaller set of data to make broader generalizations or predictions. An inference reflects the meaning that the observer is making from the data, and may be indicated with phrases like *I predict…, I think…, because…,* or *therefore…*, or by imprecise qualifiers like *smarter*, *adequate*, or *poorly*.

Example: About one third of our students are not on track to meet the mathematics criteria for graduation.

Both observations and inferences play crucial roles in the data analysis process. What is important is to distinguish between the two. The Team should be sure to rigorously examine the data for patterns, trends, and outliers that can be factually explained, prior to making any inferences or conclusions about what those patterns may mean.

ANALYZING ASSESSMENT DATA

Much of the data analysis work that the District Data Team will undertake will involve assessment data. Prior to engaging in analysis, it is important for the Team to have a common understanding of assessment terms, concepts, and how these data should and should not be used to form inferences about student performance. If the Team has not done so already, it may want to review the resources on assessment literacy in the *Getting Ready* module in order to expand the Team's capacity in this area.

Activity 3.2 Making Valid Inferences From the Data

During this activity, the Team will view multiple data displays and check the inferences made by another data team for validity.

This activity also appears in the ESE Data Warehouse course DW 102. The Data Displays used are all "Pre-defined Reports" from the ESE Data Warehouse. You may want to revisit *Activity 1.5 Assessment Literacy*.

(3.2.1T: Practice Making Valid Inferences)

INCORPORATING OTHER TYPES OF DATA

To this point, making inferences has been based on only one measure, the MCAS. Yet no single data source can provide a complete picture of the business of teaching and learning within the district. The District Data Team can increase the validity and credibility of its inferences if it can use a variety of related data sources to provide more information about the question being investigated. Because unconscious biases and assumptions can unknowingly skew analysis of data, a group can increase the validity and credibility of the inferences it generates by ensuring at least two data elements yield the same or similar information.

The Team might consider the impact of simultaneously examining data from two or more of the domains discussed in the *Getting Ready* module: student outcomes; perceptions of stakeholders; demographics of students; faculty and staff; and school and district processes.[2] Similarly a team might consider looking at data from different intervals throughout the year.

Questions the Team might ask when triangulating across data sets include:

- What patterns or inconsistencies are evident across the different data sets?

- Do different data sets reveal the same patterns and trends? If not, what can be learned from the differences? (For example, does the same student score at comparable levels of proficiency on different assessment measures?)

- How has the data changed over time? (Longitudinally)

- How does the data compare with data from other populations in the district?

Activity 3.3 Data Analysis Protocol

These protocols can guide the District Data Team in the process of analyzing data from non-traditional and/or multiple sources.

(3.3.1T: Data Analysis Protocol)

FACILITATING THE PROCESS

When designing the format for a discussion of data, the district may want to assign a facilitator who can help the group with the following:

- Ensure all Team members have an equal voice in sharing observations of the evidence that has been gathered

- Put as much data on the table as possible, from high-level to fine-grained observations

- Keep the conversation at the level of specific and objective evidence, redirecting people if the language drifts to become more general and/or judgmental

- Beware of allowing broad generalizations based on only one source of evidence

- Challenge each other's assumptions and generalizations by asking "why?" and "what's the evidence?"

- Be prepared to be surprised

- Think ahead about what the group might want to report out to others in the district and how, and look for ways to generate reports and visuals as part of the discussion process. For example, might the group want to leave certain flip charts up for display and public comment? Would it help to type notes directly into a laptop so they don't need to be rewritten later?

It is crucial for the Team to create the conditions for thoughtful consideration of the evidence. If the Team reads the data wrong, it can misdiagnose the appropriate course of action. As with medicine, car repairs, or other problem-solving processes, a misdiagnosis could not only result in wasted time and resources, it could also actually cause damage. The more time the Team spends engaging with data, critically looking at the data, and asking each other hard questions about the inferences drawn from these data, the more capacity it will build and the more confidence it can have in the subsequent conclusions and actions taken.

MODULE SUMMARY

The *Information* module provides concepts and tools that enable the District Data Team to further the inquiry process introduced in the preceding module, *Inquiry*. It offers guidance for collecting data specifically related to the focusing and clarifying questions generated in the *Inquiry* module, and revisits tools from that module to guide meaningful displays of that data.

The module helps clarify the difference between making factual observations from data and making inferences about what the data mean. It also provides a protocol for the District Data Team to use to engage with the data related to its inquiry process and the focusing and clarifying questions that are guiding it.

The District Data Team should emerge from this stage in the process with inferences or conclusions drawn from the data analysis process, and perhaps also with some new questions for consideration.

All of this work sets the stage for the next module, *Knowledge*, which will help the Team place the information that it gathers in the context of research and practice literature, as well as local knowledge and expertise. This will help the Team narrow and refine its focus even further as it moves toward identifying strategies and actions steps to address the problems that it has identified.

References

[1] Adapted from Tufte, E. (2009, November 10). *Presenting Data and Information*. Boston, MA.

[2] Adapted from Bernhardt, V.L. (2004). *Data Analysis for Continuous School Improvement.* Larchmont: Eye on Education.

For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

DATA COLLECTION PLANNING TOOL   3.1.1T

Purpose	To guide the collection of specific data needed to answer a focusing question and its related clarifying questions.
Description	Use this template to identify who will collect specific data needed for analysis.
Time	30–90 minutes

Related Documents
3–Information Module

Instructions: In the table below, begin by listing the specific data elements needed in order to address each of the clarifying questions in your inquiry process. If the Team has completed *2.5.2T: Focusing Question Investigation Template,* it can simply use the list of data documented there.

For each data element, indicate the required information. A *Data Inventory* (*1.5.1T*) can help identify the location/owner of the data. For this stage in the process, the most important details to note are who will collect the information, by when, and in what format.

Question/Issue being addressed: _____

Data Element Needed	Location/Owner	Who Will Collect It for the Team?	By When?	In What Format? Paper, Electronic, etc.

Data Element Needed	Location/Owner	Who Will Collect It for the Team?	By When?	In What Format? Paper, Electronic, etc.

PRACTICE MAKING VALID INFERENCES   3.2.1T

Purpose	To practice making valid inferences.	Related Documents
Description	This activity can be used within your Data Team or with other audiences to improve data analysis skills. During this activity, you will have the chance to view multiple data displays and —chek" the inferences made by another data team for validity.	3–Information Module
Time	About 30 minutes.	

Practice Making Valid Inferences

1. Read a scenario.

2. Review the accompanying data display to observe what the data say.

3. Consider the statements provided.

4. As a Data Team, decide which statements are *observations* (factual interpretations) and which are *inferences* (conclusions, explanations, or conjectures).

5. Also, note whether each statement is *true*, *not necessarily true*, or *false*.

6. Possible answers are provided at the end.

Scenario #1

The Data Team in District A wanted to examine the performance of 8th grade students on the 2007 MCAS ELA and Mathematics tests. The Team posed this focusing question.

FOCUSING QUESTION

How did our 8th graders, district-wide, perform on the 2007 MCAS tests?

3.2.1T: Practice Making Valid Inferences—Version 1.0

Year: 2007
District: District A
Grade: 8
Subject1: English
Subject2: Math

ESE Data Warehouse Pre-defined Report
R-303: District Performance Distribution
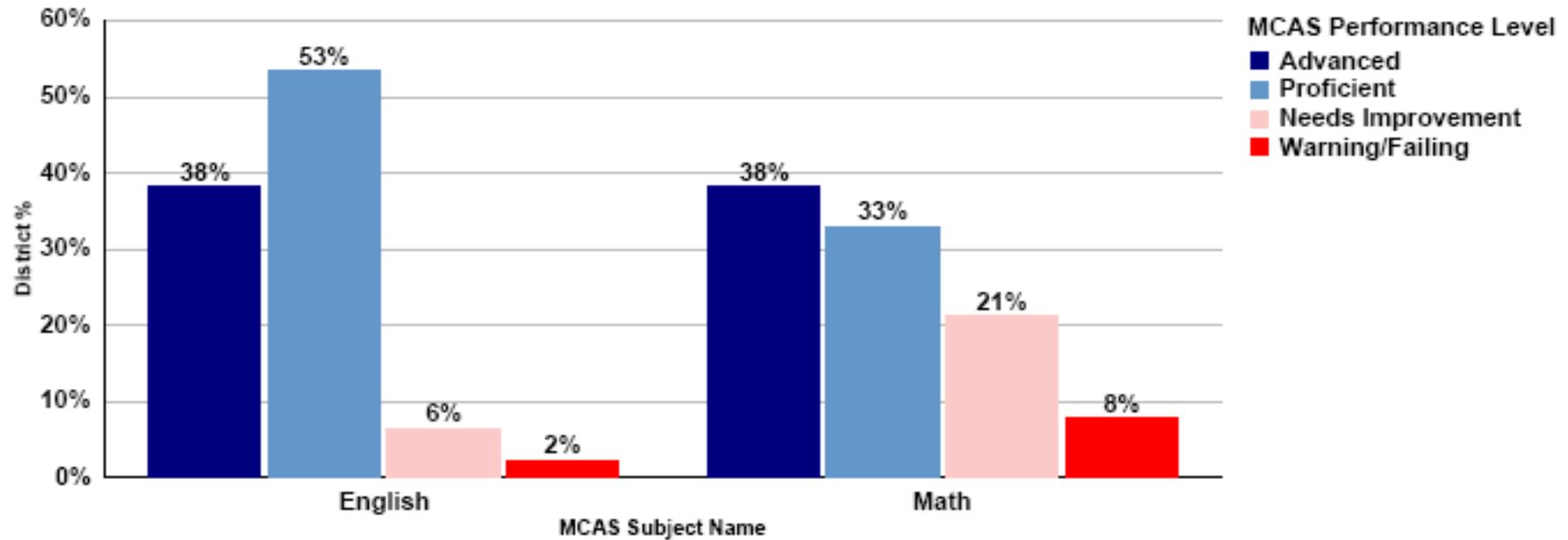
MCAS Subject Name	MCAS Performance Level	District #	District %	State %
English	Advanced	103	38%	30%
	Proficient	144	53%	56%
	Needs Improvement	17	6%	10%
	Warning/Failing	6	2%	3%
Math	Advanced	103	38%	30%
	Proficient	89	33%	28%
	Needs Improvement	57	21%	25%
	Warning/Failing	21	8%	17%

NOTE: MCAS results are suppressed (–) for cohort counts fewer than 10. Suppressed cohorts are not rendered in charts.

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District Performance Distribution Report (R-303)

| Statement	Observation or Inference?	True	Not Necessarily True	False
1A. Our students are smarter in English than they are in mathematics.				
1B. Compared to the state, our students performed poorly in mathematics.				
1C. About one third of our students performed below proficient in mathematics.				

3.2.1T: Practice Making Valid Inferences—Version 1.0

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Scenario #2

SCENARIO

After comparing the performance of the students in District A to the performance of students statewide, the Data Team posed a clarifying question.

CLARIFYING QUESTION

How did the mathematics performance of the 8th graders in our district change over the past three years?

Year(s): 2005, 2006, 2007
District: District A
Grade: 8
Subject: Math

ESE Data Warehouse Pre-defined Report
R-305: District Performance Distribution by Year
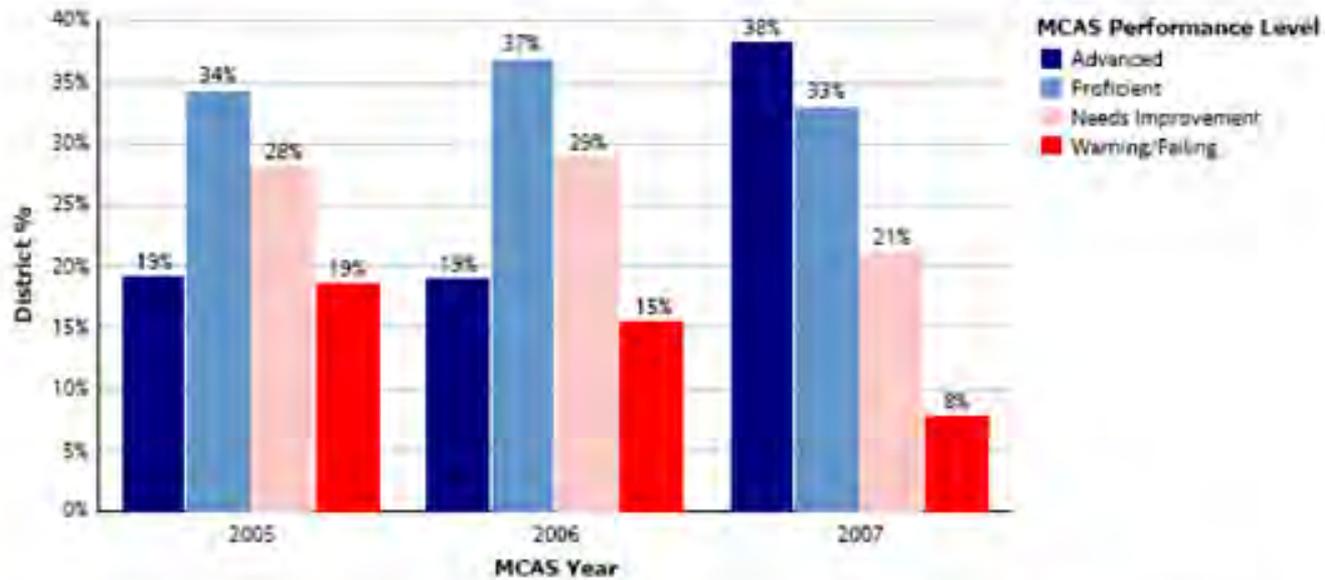
MCAS Year	MCAS Performance Level	District %	District #	State %
2005	Advanced	19%	60	16%
	Proficient	34%	107	33%
	Needs Improvement	28%	88	31%
	Warning/Failing	19%	58	20%
2006	Advanced	19%	54	18%
	Proficient	37%	105	32%
	Needs Improvement	29%	82	30%
	Warning/Failing	15%	44	21%
2007	Advanced	38%	103	30%
	Proficient	33%	89	28%
	Needs Improvement	21%	57	25%
	Warning/Failing	8%	21	17%

3.2.1T: Practice Making Valid Inferences— Version 1.0

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District Distribution by Year Report (R-305)

Statement	Observation or Inference?	True	Not Necessarily True	False
2A. Students who were in 8th grade in 2007 made gains from year-to-year since 2005.				
2B. 8th grade performance has improved from year-to-year.				
2C. Our year-to-year trend performance follows the state's trend performance.				

3.2.1T: Practice Making Valid Inferences—Version 1.0

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Scenario #3

The District Data Team reviewed the longitudinal performance of the district's students and concluded that the percent of students scoring at the lowest level decreased each year and the percent scoring at the Advanced level increased dramatically in 2007. This was encouraging, but the Team felt that performance could still be improved. The Team formulated the following clarifying question.

CLARIFYING QUESTION

With which specific strands and standards did the students have the most difficulty?

Year: 2007
District: District A
Group: None
Grade: 8
Subject: Math

Subgroup: None

MCAS Subject Name	State % Correct	District % Correct
Math	68%	75%

MCAS Question Type	State % Correct	District % Correct
Multiple-Choice	71%	76%
Open-Response	65%	72%
Short-Answer	67%	74%

MCAS Strand Name	MCAS Standard Name	State % Correct	District % Correct
Data Analysis, Statistics, and Probability		66%	72%
	Inferences and Predictions	66%	70%
	Probability	42%	50%
	Statistical Methods	69%	75%
Geometry		70%	76%
	Locations and Spatial Relationships	67%	74%
	Properties of Shapes	81%	85%
	Visualization and Models	69%	76%
Measurement		63%	69%
	Measurable Attributes and Measurement Systems	52%	58%
	Techniques and Tools	65%	71%
Number Sense and Operations		68%	73%
	Computation	64%	73%
	Numbers	72%	77%
	Operations	57%	62%
Patterns, Relations, and Algebra		72%	79%
	Change	68%	75%
	Models	77%	87%
	Patterns, Relations, and Functions	81%	87%
	Symbols	76%	80%

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District Standards Summary Report (R-306)

Statement	Observation or Inference?	True	Not Necessarily True	False
3A. Our students performed better than students statewide in each of the strands.				
3B. Out of all the strands, our students performed worst in **Measurement**.				
3C. Compared to student performance statewide in the strand **Patterns, Relations, and Algebra**, our students performed the best on the symbols standard.				

Scenario #4

The review of the District Standards Summary Report helped the Team determine specific areas where the students were weak on the 2007 test. The Team delegated several members to review this report for the three prior years to see if these strands were problems for the students on those tests.

The Data Team also wanted to learn more about the performance of subgroups on specific test items. The Team posed the following clarifying question.

CLARIFYING QUESTION

How did the ELL students in our LEP program perform across all test items as compared to all students in the district and in the state?

Year: 2007
District: District A
MCAS Grade: 8
Subject: Math
Subgroup: LEP

3.2.1T: Practice Making Valid Inferences—Version 1.0
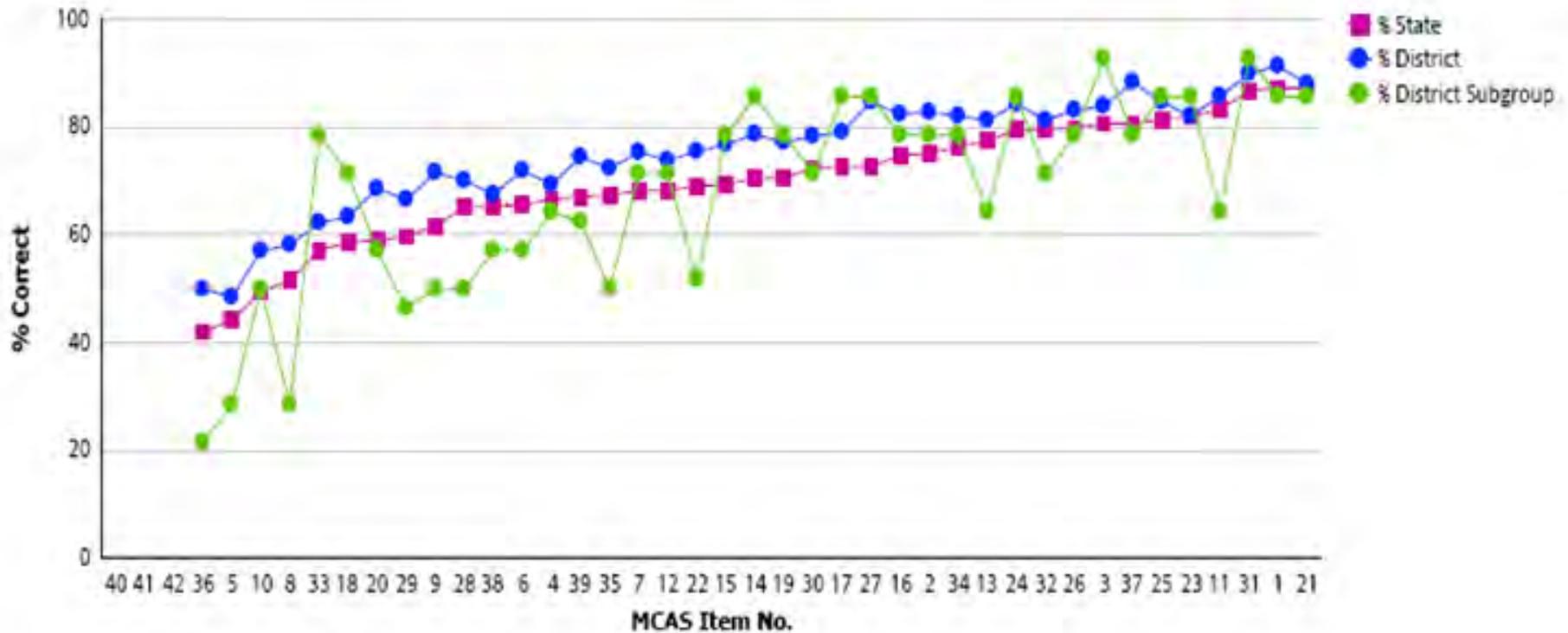
District Item Analysis Graph (R-302)

Statement	Observation or Inference?	True	Not Necessarily True	False
4A. The performance pattern of all students in our district follows the state more closely than the pattern for LEP students.				
4B. Item 36 is the most difficult item.				
4C. Our LEP program is not preparing our students adequately.				

3.2.1T: Practice Making Valid Inferences—Version 1.0

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Possible Answers

Instructions:

Reflecting on the statements that have been made using the data reports:

- Which are Observations and which are Inferences?
- Which are True, False, or Not Necessarily True (more data needed)?
- What clarifying questions would help make better inferences?

Scenario #1

1A. Inference (NNT) – The English (reading comprehension and writing) assessments are developed to assess completely different knowledge and skills, so a mathematics score cannot be directly compared to an English score.

1B. Inference – (F) The statement is false because our students performed BETTER than the state at each performance level. It is an inference because poorly is a conclusion that is not factually precise.

1C. Observation – (T) 29% of our students performed below proficient.

Scenario #2

2A. Inference – (NNT) While the data do show increases in MCAS performance from 2006 to 2007, there could be slight differences in the student cohort due to changes in population since 2005. Additionally, the data do not reflect individual student growth over time, only MCAS scores for a class from one year to another. You would need more data to be sure.

2B. Observation – (T) The percent of students below proficient decreased over time. Caveat–again, these are different groups of students.

2C. Observation – (F) For the first two years, our students showed a small decrease in the percent of students below proficient, while the state stayed at about the same level (percent at warning actually increased slightly). In the most recent year, there was a decrease in percent below proficient at the state level, but a much larger decrease among the tested students in District A.

Possible Answers (continued)

<u>**Instructions:**</u>
Reflecting on the statements that have been made using the data reports:
- Which are Observations and which are Inferences?
- Which are True, False, or Not Necessarily True (more data needed)?
- What clarifying questions would help make better inferences?

Scenario #3
3A. Observation – (T) A larger percentage of District A students was successful in each strand than students statewide.
3B. Observation – (T) Relative to all other strands, our students did indeed score the poorest in Measurement.
3C. Observation – (F) They performed best in Models relative to the state (10 percentage points difference).

Scenario #4
4A. Observation – (T) LEP student pattern is up and down and district pattern and state pattern are very similar overall. Stress that this is probably due to the relatively small size of the population. Smaller populations show greater variation.
4B. Inference – (NNT) A factual interpretation (observation) is that the LEP group and the State scores are lowest for Item 36, but not for the District. It is an inference that this is the most difficult item for these groups, as there could be other reasons why so many students scored low on it.
4C. Inference – (NNT) You can't infer this from the data. For example, the most difficult items for the LEP group may be those that have the most language, such as story problems. The next step is looking at the actual items and drawing conclusions about what might have made the items difficult for the LEP subgroup. Also, the LEP students did better than the other two populations on several items.

3.2.1T: Practice Making Valid Inferences—Version 1.0

DATA ANALYSIS PROTOCOL   3.3.1T

Purpose	To collaboratively analyze data.
Description	The protocol is a collaborative process for analyzing data that can be applied to many types of data.
Time	About 60 minutes.

Related Documents
3–Information Module

This is a collaborative protocol designed to be used by groups of 3–5 people. It is necessary to identify the questions that are being addressed and prepare (or gather) the necessary data prior to beginning the protocol (such as those generated by *2.1.1T: Question Formulation Protocol*). Be sure all are clear on the protocol before beginning.

1. **Write** the question(s) being analyzed at the top of a piece of chart paper. Check to make sure each person understands the question. **(1–5 minutes)**

2. **Distribute** copies of the data in either graphical or numerical displays to each member of the Team. Ask each person to silently observe the data by taking notes and jotting observations. **(5 minutes)**

   Note: By this point, the Team may have three levels of data: high-level data that spurred the inquiry in the first place; data used in the data overview (2.3.1) to generate clarifying questions; and even more specific data collected subsequently to address these clarifying questions. In some cases, the first two data sets may be fairly similar. Engaging with all data sets simultaneously can better poise the group to see patterns, trends, and outliers that had not previously been evident.

3. **Observe: (15 minutes)** Ask Team members to take turns (round-robin fashion) and report one of their observations. Observations should be facts or evidence that can be readily seen in the data and stated without interpretation.

   Instruct participants to use a sentence starter like one of the following to keep the observations factual:
   > *I see…*
   > *I observe…*
   > *I notice…*

Remember. Only discuss the facts at this stage of the process!
If you catch yourself using any of the following, **STOP**!

~~However…~~   ~~Because…~~   ~~Therefore…~~

After participants have shared their initial observations, probe for deeper analysis by asking a combination of the following questions:

How do data sets (or populations) compare to each other?
> *Such as comparing one grade to another, or school vs. district vs. state*

What are the commonalities among a given data set (or population)?
> *Such as among students who are scoring below standard, or those who are achieving?*

What patterns or similarities are evident across different data sets?
> *Such as comparing local formative assessment data with state assessments like MCAS, or comparing student achievement with teacher attendance.*

What inconsistencies or discrepancies (if any) are evident?

What is not represented in the data?

What questions do the data raise?

Capture the observations in list form on the chart paper as quickly as possible and without comment. Capture questions on a separate sheet. Continue until all Team members have reported all of their observations. (Note: During this step, it is acceptable for Team members to make observations based on those made by others in the group. Allow the process to proceed as long as logical and factual observations can be made.)

Note: It is often helpful to make a very distinct transition from the observation stage to the interpretation stage, clarifying when the group can begin to allow statements that may not be factually based.

4. **Interpret: (20 minutes)** Ask each Team member to review the entire list of observations. Working together, code (or group) the observations into categories of findings. To facilitate this process ask questions such as:
   > *What assumptions might be underneath what we are noticing in the data?*
   > *What clues help explain why a certain population is meeting or missing targets?*
   > *What areas in the data stand out as needing further explanation?*
   > *What patterns or themes do we see in our observations?*
   > *Which of these observations are most relevant and important to our inquiry?*

   And finally:
   > *Based on our observations, what do we know now?*

5. **Extend: (10 minutes)** On a new piece of chart paper, write ―New Questions and Conclusions." Work as a group to identify new questions that this analysis has raised and any possible conclusions that have been identified. The questions may serve as the basis for another round of analysis, so it may be helpful to conclude by prioritizing them. Any conclusions will become the basis for subsequent action.

Massachusetts Department of
ELEMENTARY & SECONDARY
EDUCATION

District Data Team Toolkit

MODULE 4: Knowledge

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Tools and Resources for Knowledge

4.1.1T: Writing a Problem Statement	4.2.5T: Dimensions Bulls-Eye
4.2.1T: Why, Why, Why?	4.3.1T: Problem Investigation Plan
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4.2.3T: Fishbone Analysis	4.4.1T: Problem Catalogue Template
4.2.4T: Graphic Representation	

INTRODUCTION

WHERE ARE WE NOW?

The District Data Team Toolkit is based on the Data-Driven Inquiry and Action Cycle. The Cycle provides the structure that takes data use within the district from asking the right questions to getting results. It is an iterative process in which the district acts on data to support continuous improvement. The Toolkit uses the steps of the Cycle to structure a progression through the model—you are now in *Module 4: Knowledge*.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Getting Ready	Inquiry	Information	Knowledge	Action	Results

In the *Knowledge* step of the Data-Driven Inquiry and Action Cycle, a group engages in deeper analysis of the data and collaborates to begin using this new perspective to inform strategic action. The tools in this module can help a Team collaboratively refine questions that emerge from data analysis, articulate a problem statement, connect possible solutions with research, and lay groundwork for results-oriented action.

The most important parts about this transition from analysis to action is taking time to make sure all members of a group are clearly in agreement on the problem being addressed, and that an effort is made to connect the problem to research and to other district efforts to solve the same problem. Being purposeful during this step helps a Team avoid repeating past mistakes and strengthens its ability to take effective action.

MODULE OBJECTIVES

The **Knowledge** module will help a District Data Team:

- Clearly articulate a problem statement

- Identify and explore root causes of the problem

- Cross-reference solutions with research and local knowledge

- Begin to capture information on the district's improvement efforts

CLARIFYING THE PROBLEM

In the *Inquiry* module, the District Data Team formulates a number of questions for study and refines them through discussion and data analysis. During the *Information* module, the Team delves more deeply into the data and triangulates multiple data sources to get the best understanding possible of the issues at the heart of the focusing and clarifying questions. The Team may emerge from this analysis with a clear set of conclusions that address the initial focusing and clarifying questions. It may also generate a number of new questions raised by their investigation of the data.

Teams that want to explore the questions that emerge from the data analysis may want to engage with the root cause activities outlined later in this module to gain new perspectives on the factors that may explain the patterns, trends, or aberrations evident in the data. If this process does not help the Team gain agreement on the problem to be addressed, then it will likely reveal a need for more data or different questions, which would cycle the Team back to the *Inquiry* stage of the process.

Teams that emerge from the data analysis in the *Inquiry* module with strong conclusions may be ready to move toward planning action by first crafting a problem statement.

> **A** problem statement can help the Team focus its work prior to validating potential solutions with research and then moving on to action.

WRITING A PROBLEM STATEMENT

A problem statement can help the Team focus its work prior to validating potential solutions with research and then moving on to action. A problem statement can also help the Team communicate with stakeholders that will need to be engaged in this work, including students, families, teachers, and other school and district personnel.

A problem statement can help the Team articulate:

- The original undesirable situation (the problem)

- The desired outcome (the goal)

- The underlying problem causing the original problem

- The solution to that underlying cause

Writing a problem statement can serve as a self-check to see if the Team is ready to move on. If the Team is all in agreement about the nature of the problem being addressed and how to best approach resolving it, writing a problem statement may be a fairly straightforward activity. However, the Team may find that while working through the process of writing a problem statement, Team members are not in alignment or agreement. In fact, frequently a number of ideas about how to address those issues are raised during the discussions. If that is the case, the Team will want to use one of the *Root Cause Analysis* activities in the next section to calibrate the Team and then return to *4.1.1T: Writing a Problem Statement*.

One element of a problem statement involves describing the nature of the problem identified in the data analysis. Articulating the type of problem can help the Team think wisely about the best strategies to put in place to resolve it. Problems can be broadly categorized as relating to skills, attitudes, knowledge, and/or resources.

However, ultimately, regardless of the specific nature of the problem, it is the adults in a district who create and maintain the learning opportunities for the students they serve. This includes not only teachers and principals, but *all* district employees, such as secretaries, facilities staff, central office staff, district leadership, and school committee members. Resolving problems with teaching, curriculum implementation, or resource allocation all involve shifting how adults throughout the district approach and conduct their work. Therefore, in articulating a problem statement, it is important that the proposal for addressing the problem paint a clear picture of how this will change–what the work needs to look like and how the district will help personnel make the needed changes.

From this angle, when identifying the solution to address the underlying problem, a district would be wise to first consider how it can reallocate existing resources and improve existing initiatives. The inclination is often to identify new strategies or initiatives, but the Team should first evaluate the efficacy and impact of current initiatives before adding new ones. A new initiative should be added only if it is unarguable that the need exists.

> **R**esolving problems with teaching, curriculum implementation, or resource allocation all involve shifting how adults throughout the district approach and conduct their work.

Activity 4.1 Writing a Problem Statement

This is a collaborative process meant to help the Team discuss a problem in depth and write an agreed upon statement about how it will be addressed.

(4.1.1T: Writing a Problem Statement)

ROOT CAUSE ANALYSIS

UNDERSTANDING ROOT CAUSES

Engaging in a root cause analysis can help the Team gain agreement on the exact nature of a problem it has identified, and/or on the best steps to take in addressing it. Before taking action, the Team needs to agree on the problem that needs to be fixed. This is rarely an easy task.

In simplest terms, a root cause is an underlying factor or condition that creates a problem and that, if addressed, would eliminate or dramatically alleviate the problem. A root cause analysis can help a group with widely varying opinions narrow the field of contributing factors until it agrees on what one(s) will yield the biggest bang for the buck if it acts on it.

In mechanical systems, diagnosing a root cause is an essential part of the troubleshooting process before beginning work. For example, if a person's car won't start in the morning, s/he having a problem. There are a number of potential root causes of that problem until some further investigation is done. Among many other things, it could be possible that:

- The battery cable isn't connected

- The battery is dead

- The starter motor isn't working

- The car is out of gas

Investigating each of these potential root causes helps to determine what is or is not the root of your trouble. Going through this effort is important, because replacing a starter motor after getting a tow to a repair shop would be an unnecessary expense if the real problem was simply that the individual spouse or teenager brought the car home with an empty tank of gas.

Naturally, discerning root causes for problems in education is not nearly as straightforward as this example suggests, and root causes are not always known. For example, a student's low academic achievement could be the result of:

- Something the student is or is not doing

- Something the teacher is or is not doing

- Something the teacher's support network, e.g., principal, coach, district central office, district processes, is or is not doing

- Something the student's support network, e.g., family, friends, community, is or is not doing

- Something the physical learning environment is or is not providing

- A combination of the above

Researchers engage in rigorous discourse to discern the most significant factors behind student achievement and learning. Practitioners must do their best to tap the best available knowledge when trying to determine the root causes of problems in their own district.

Discerning the root cause of educational problems is a difficult task for another reason. People tend to have strong beliefs about problems in schools and how they should be solved. These beliefs are influenced by personal values, political issues, opinions about strategies tried in the past, and many other factors. Therefore, it is important for any group attempting to solve a problem to take the time to collaboratively get all issues surrounding it out on the table for discussion.

Something to keep in mind is that in education, a problem with student achievement likely has a cause that lies in someone's practice. A district cannot change the outcome (such as low test scores) without changing someone's behavior. Like in the example about the car, the Team will be following a chain of cause/effect relationships to find where the work needs to be done. But unlike replacing a part in a car, computer, or other inanimate machine, the Team will likely end up determining that the root cause lies in processes or techniques that people in the system are using, but that, despite everyone's best efforts, just aren't getting the job done the way it needs to be done. While in some cases it may be that a process isn't being implemented correctly, in other cases it may be that the right strategy hasn't been applied in the first place. In order to change student outcomes, a district needs to change the actions of its personnel in concrete ways that lead to the desired outcome.

The collaborative tools shared here are meant to help the Data Team understand and agree on the issues that are most responsible for the problems it has have identified, in order to begin planning well-considered and researched strategies and engage people in the process of changing practice. These activities are not intended to be used to place blame on anyone in the system, but rather to understand where the most energy and attention should be placed in order to get different results.

> **I**n order to change student outcomes, a district needs to change the actions of its personnel in concrete ways that lead to the desired outcome.

It should be noted that root cause activities are useful for analyzing the factors that contribute to success, as well as those that contribute to a problem. For example, if an initiative produced very strong results, engaging in these activities could help the Team capture lessons to scale up in other areas of the district's work.

OVERVIEW OF ROOT CAUSE PROTOCOLS

Below are five possible approaches for engaging in a root cause discussion, listed in order from simpler to more complex activities. Each has its own strengths and challenges when working with different groups. Read through them all and consider trying each of them out within the District Data Team to get an idea of how they work and how well they would engage other audiences. Any of them can be used with any sized group, but some general suggestions for use are below.

In choosing the approach that is best for the situation, the Team will want to consider the complexity of the problem and the depth of additional analysis needed in order to gain agreement on the root cause. It will also want to ensure it has the time and facilitation skills required to conduct the activity successfully.

- **Why, Why, Why?**—This protocol is a relatively quick and informal technique for identifying root causes of problems. It can be used by individuals or groups of 3–8 people, and requires little facilitation. This technique is especially useful to start a discussion and determine if there is disagreement among the participants. A more formal process should be used for in-depth discussion.

- **20 Reasons**—This protocol works well with a large or small group. It enables the group to brainstorm many issues related to a particular problem and then carefully consider whether they are actual causes or simply excuses.

- **Fishbone Analysis**—This very formal protocol works well with groups of about three to five participants. The protocol provides the chance for the group to consider and discuss many possible explanations for a problem and enables participants to categorize causes.

- **Graphic Representation**—This protocol enables a group to discuss, analyze, and display relationships among contributing factors. In essence, the group creates a visual representation of the problem or situation, including all the factors that influence it and possible solutions that have come to light during the analysis. This highly collaborative technique works best with groups of up to five people and requires a somewhat skilled facilitator.

- **Dimensions Bulls-Eye**—This protocol, derived from the Department's Performance Improvement Mapping (PIM) process, is a lengthy but effective way to brainstorm possible root causes, sort them into one of three dimensions of district improvement, and prioritize key root causes for action. This process works best with a group 7–10 people and requires strong facilitation.

Each of these activities should steer participants toward evaluating the extent to which existing systems and structures are functioning as intended and genuinely impacting teaching and learning. The end result of any of these activities should be that the group has a clear and uniform idea of the problem, its potential root causes, and how the Team will proceed to take action.

Regardless of the method used to surface root causes, it is important for the Team to identify evidence that verifies its ideas. If the Team is not careful, it can unwittingly reinforce false perceptions and negative stereotypes. Thus, Team members should constantly ask each other ―How do you know?" When available information and data have been consulted, the Team should discuss whether significant evidence exists to confirm the Team's hypothesis about the causes. Without this self-check against valid evidence, the root causes that the Team identifies to target for action may not be deemed credible by stakeholders.

After completing any of the *Root Cause Analysis Protocols*, the Team should return to the *Writing a Problem Statement* worksheet and prepare a newly aligned view of the problem and potential solution.

Activity 4.2 Root Cause Analysis Protocols

These activities can facilitate the Team's discussion of root causes. The protocols can be used in many different situations to explore problems in a collaborative way. The Team should select the approach that seems best for its particular group or situation, or create its own using these as templates.

(4.2.1T: Why, Why, Why?)
(4.2.2T: 20 Reasons)
(4.2.3T: Fishbone Analysis)
(4.2.4T: Graphic Representation)
(4.2.5T: Dimensions Bulls-Eye)

FACILITATING THE PROCESS

The Team should think strategically about which groups to involve in the process of root cause analysis. While the District Data Team on its own could likely generate valuable insight on a problem, it is often best to engage those closest to the problem in the identification of the root causes that, if addressed, would improve the situation. As well-intentioned as the Team may be, it may miss valuable information by not going closer to the source.

For example, a district might consider having teams from a number of different schools engage in the protocols, then notice the patterns that emerge, and use that information to decide how to best leverage district resources. Whether school or district personnel are conducting the activity, the focus should always remain on the teaching and learning and those factors that most directly impact it.

> **I**f we believe that all students can learn, and they aren't, then we need to look at what *we* can do differently.

Each of these root cause protocols is based on the premise that adult behavior and district processes impact student learning outcomes. If we believe that all students can learn, and they aren't, then we need to look at what *we* can do differently. While some root causes may indeed be out of the district's hands, such as student mobility or the effects of poverty, the District Data Team needs to look very closely at how the district conducts the business of educating students and what aspects of this work may or may not be contributing to the problem at hand. When done well, engaging in a root cause activity can promote honest and sometimes difficult conversations about how personnel in all corners of the district conduct their work, including the members of the Team itself.

However, participants frequently disagree about root cause explanations for the original problem, the sequence of causes and effects, or the relative importance of various possible causes during the brainstorming phase of this activity. The group may even come up with explanations that are directly contradictory to one another. This has some important implications for facilitating the process of discussing root causes.

- Any time a protocol requires brainstorming, keep the group focused on first listing as many ideas as possible. Do not allow debate, discussion or even comments like great idea at that time. Once *all* the ideas are generated, the group can then ask for clarifications, probe for greater understanding, and move past less important disagreements to focus on more significant points

- The Team should encourage and record dissenting views rather than immediately dismiss any that might arise. The subsequent discussion and reflection will sometimes reveal which perspective

is more likely to be true. If this does not happen, the Team can consult research and local knowledge for more insight

- Many of the ideas generated in the activities should be regarded as biases, opinion, or conjecture until proven otherwise with data or research. The Team must objectively look at the assumptions it holds and check them against research, data, and expert opinion. Just because everyone in the group happens to agree does not mean any given potential root cause is right

- In fact, unlike cars that won't start, we often don't really know the right answer. The Team has to pick one potential root cause that, based on data analysis, research, and local knowledge, seems like it may make the most impact, and then try to resolve it. By monitoring progress, evaluating results, and continuing the inquiry process, the Team can model the truly adaptive nature of education where educators learn the work by doing it, and develop the answers together along the way

When designing the format for a discussion of root causes, a district may want to assign a facilitator who can help the group with these key points, as well help the Team:

- Ensure all Team members have an equal voice in sharing observations of the evidence that has been gathered

- Put as much data on the table as possible, from high-level to fine-grained observations

- Challenge each other's assumptions and generalizations by asking why and what's the evidence?

- Be prepared to be surprised

The Team might also consider engaging stakeholders directly in these discussions, as a way to gain new perspective on the topic as well as gain buy-in on the strategies that emerge from this work. This could be especially important if the Team is small and/or is not very representative of the stakeholders impacted by the problem, such as if it only consists of district-level personnel.

CONNECTING TO RESEARCH AND LOCAL KNOWLEDGE

Once the Team has clearly defined the problem and everyone has agreed to a general strategy to alleviate it, the Team might feel ready to move straight to building an action plan with specific goals, timelines, and data collection points. But, before moving on, it is important to begin making connections to research and local knowledge, looking outward for information that might be helpful in shaping the Team's work.

CONNECTING TO RESEARCH AND LOCAL EXPERTISE

By this point, the Team has clarified the problem and has articulated:

- The original undesirable situation (the problem)

- The desired outcome (the goal)

- The underlying problem causing the original problem

- The solution to that underlying cause

Up to this point, the Team has worked on its own—or perhaps with some input from stakeholders—to identify the underlying problem and a proposed solution. Taking time to consult local experts, research literature, and others outside the District Data Team who have gone down the same path, can increase the effectiveness of the plan for action, as well as increase its credibility and validity.

The attached *Problem Investigation Plan* guides the Team to articulate the information it wants to gather prior to going out and getting it. Taking this step can help the Data Team maintain focus prior to diving in to what could be an overwhelming amount of research and information.

When consulting research, the District Data Team should be mindful that the Internet makes it much easier to connect to a wide range of scholarly research—however, not all research is good research. The District Data Team has a responsibility to ensure that the research it uses is credible, and as such should look for research from credible independent sources.

4.3.2R: Educational Research Websites includes a list of useful websites that can connect districts to other websites with searchable educational research reports. This list, while by no means meant to be

comprehensive, can serve as a starting place for gathering credible researched reports related to the problem the Data Team is addressing and interventions the Team is considering. In addition, Team members may want to consider tapping academic and/or research institutions directly, whether by linking to their own undergraduate and/or graduate institutions, or by connecting to those located in or near their district.

When identifying local knowledge and expertise that can further clarify the problem and aid the development of an effective action plan, the Team may want to consider:

- Who has credible perspectives and expertise related to this problem?

- Who has knowledge of relevant content, systems, and history?

- Who has a solid understanding of the experiences of the stakeholders impacted by this problem? Who among the stakeholder group(s) itself may have valuable insight?

- Who does the Team not usually hear from, and whose expertise could be valuable at this point?

- Who can the Team trust to share knowledge and lessons learned that may deviate from what is commonly held as truth?

Activity 4.3 Problem Investigation

This activity helps the Team identify assumptions that need to be checked and questions that need to be answered about a problem or potential intervention. Several websites are provided to help connect the Team to related research.

(4.3.1T: Problem Investigation Plan)
(4.3.2R: Educational Research Websites)

CATALOGUING PROBLEMS UNDER INVESTIGATION

The District Data Team can facilitate the endurance of a data-driven decision making initiative by beginning to capture the work and evidence from improvement efforts. This will allow the district to begin creating a database (either electronic or in file cabinets) of questions and problems people have addressed, strategies they have used, and the results of those efforts. In addition, having a systematic way of organizing the results of various inquiry processes will make it much easier to make connections to research in professional journals, books, and web resources. Using categories in a database will allow the Team to create a searchable catalogue of improvement efforts over time, removing the need to rely only on the institutional knowledge of district personnel.

The next activity is designed to give the District Data Team a systematic way to capture problems. The Team should begin by documenting information relevant to the inquiry process in which it is engaged. Over time the Team can collect information from other teams, as well as from its own subsequent inquiry processes. The way the Team elects to capture and share this evidence and knowledge is highly unique to its local systems, personnel, time, and resources. As the Team engages with the template, it will likely want to refine the categories and format to suit local needs and initiatives. However, beyond determining the exact headers on a template, the Team also needs to make a long-term plan for collecting, storing, and using this information.

Activity 4.4 Problem Catalog Template

This template contains a model for a catalogue of problems being addressed by groups throughout a district.

(4.4.1T: Problem Catalog Template)

MODULE SUMMARY

The *Knowledge* module is intended to strengthen the transition that a Data Team makes between initial data analysis and subsequent action. It is meant to help a group take a broad look at what it now knows, after having engaged in data analysis, and compare it to what else is known, prior to thinking about what do to next. Spending time and purposeful effort in the *Knowledge* step of the inquiry process can strengthen the Team's understanding of the problem before it enters the *Action* step.

Essential steps in the process of turning information to knowledge are formally stating the problem being worked on and beginning to investigate strategies for improvement by consulting research and local knowledge and expertise. In order to accomplish these two items, it is frequently necessary to spend some time calibrating the entire Team around what the real problem is (or might be) by exploring perceived underlying root causes. These can be challenging conversations at times, so it is best to conduct them using a protocol designed to facilitate safe discussions about root causes. The Team should consider the value of engaging stakeholders in the knowledge-building phase, for example by including stakeholders in discussions of root causes.

The District Data Team should emerge from this stage in the process with a clearly articulated problem statement that outlines the original problem, the suspected cause, the goal for improvement, and a proposal for moving forward.

The next module, *Action*, guides the Team in articulating a logic model and crafting or revising a plan to take action on the identified problem.

For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

WRITING A PROBLEM STATEMENT   4.1.1T

Purpose	To formalize a problem in order to focus action.
Description	This framework[1] helps a Team to discuss a problem in depth and write an agreed-upon statement about how it will be addressed. The process forces the Team to think purposefully about who is affected by the problem, possible causes, and potential solutions.
Time	About 1 hour.

Related Documents
4–Knowledge Module

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Directions: As a Team, work through the boxes from top to bottom to craft a problem statement. The next page contains a completed sample of the *Writing a Problem Statement* worksheet. A blank copy of the worksheet appears on the last page.

Original problem or focusing question	Restate the initial problem that launched this inquiry process, or rewrite the focusing question or one of the clarifying question as a statement.
Stakeholders who are most affected by the problem	Who is most directly impacted by this problem? Alternately, who would benefit the most if this problem were resolved?
Type of problem	For example, skills, attitudes, knowledge, resources, or something else.
Suspected cause of the problem	Based on the data analysis and/or the root cause analysis, what does the Team think is the most significant cause(s) contributing to this problem? What, if addressed, would make the greatest impact on resolving the problem? (Include specific evidence).
Goal for improvement and long-term impact	The wishes, dreams, and general vision describing the target. The Team will write a clearer, measureable goal statement in *Module 5*.
Proposal for addressing the problem	High-level strategy that represents promising practices drawn from research, local knowledge, and local expertise. (Note sources if possible). This will become the basis for subsequent action planning.
Final problem statement	Tie the above statements into 3–5 coherent sentences that could be easily understood by a wide range of stakeholders.

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[1] Adapted from Sagor, R. (2000). *Guiding School Improvement Through Action Research*. Association for Supervision and Curriculum Development, Alexandria, VA.

Sample of Completed *Writing a Problem Statement* Worksheet

Original problem or focusing question	◆ Students are not reading at grade level by grade 3.
Stakeholders who are most affected by the problem	◆ Third grade students at our school.
Type of problem	◆ Resources: Without good information about where our kids are starting, we have no way of knowing if our goals may be unattainable for some of them.
Suspected cause of the problem	◆ Teachers don't get sufficient training and support in our reading program. ◆ Students' reading levels are not measured accurately in grades K–3.
Goal for improvement and long-term impact	◆ We want all our third graders to read at grade level or above.
Proposal for addressing the problem	◆ Start a teacher mentoring program in reading. ◆ Implement more rigorous reading assessments in grades K–3.
Final problem statement	◆ Many third grade students at our school do not read at grade level. ◆ We believe that this is a result of teachers not having sufficient training in our reading program and not accurately measuring students' reading levels in grades K–3. ◆ We want all third graders at our school to read at grade level or above. ◆ We will start a teacher mentoring program focused on reading and implement more rigorous reading assessments in the primary grades.

Writing a Problem Statement Worksheet

Original problem or focusing question	
Stakeholders who are most affected by the problem	
Type of problem	
Suspected cause of the problem	
Goal for improvement and long-term impact	
Proposal for addressing the problem	
Final problem statement	

WHY, WHY, WHY? 4.2.1T

Purpose	Determine a root cause for a problem.
Description	A Team brainstorms answers to "Why?" a problem might be happening in order to arrive at an agreed upon root cause.
Time	< 30 minutes.

Related Documents
4–Knowledge Module
4.2.2T: 20 Reasons
4.2.3T: Fishbone Analysis
4.2.4T: Graphic
      Representation
4.2.5T: Dimensions Bulls-Eye

Directions

Why, Why, Why? is a relatively quick, informal way to identify root causes of problems. Start by writing the problem being addressed and then ask the group to give a reason for "Why this might be happening?" Record the answer after the first "Because" and then ask the question again in reference to the first "Because." Repeat the process three to five times, asking "Why?" for the previous "Because" until the group feels that it has arrived at the root cause of the problem. If after three to five questions and answers, the group does not agree that it has found a root cause, consider using another root cause protocol in the Toolkit.

Problem/Barrier/Issue

_____

_____

_____

_____

Why?

Because: _____

_____

_____

Why?

Because: _____

_____

_____

Why?

Because: _____

_____

_____

Purpose	Determine a root cause for a problem.
Description	A Team or large group brainstorms 20 reasons why a problem might be occurring in order to come to agreement about what the real cause of the problem might be.
Time	45 minutes to an hour.

Related Documents
4–Knowledge Module
4.2.1T: Why, Why, Why?
4.2.3T: Fishbone Analysis
4.2.4T: Graphic
      Representation
4.2.5T: Dimensions Bulls-Eye

Directions: Use a computer and projector to display the *20 Reasons* worksheet on the last page, or use chart paper to recreate the simple list.

1. Begin by writing the problem in the box at the top of the page.

2. Ask the group to give possible reasons for why the problem may be occurring. It may be helpful to use a round-robin response order to get people started, but try to allow the team to call out reasons as they come to mind. Record them all until you have reached a full list of 20 reasons.

3. Allow the group to review the list silently for a few moments.

4. Ask each member to identify what s/he thinks might be the root cause of the problem. Place a checkmark next to the statement as s/he speaks and encourage him/her to explain his/her reasoning before moving on to the next person.

5. Continue to facilitate the discussion until the group feels that it has identified a potential root cause.

Key Points

▶ It should be emphasized that this is a brainstorming activity and all responses are welcome and valid.

▶ You may find the last several reasons are more difficult to come up with, but frequently the effort is worth it, as the root cause will likely appear near the bottom of the list.

▶ Many problems do in fact have more than one root cause. It is fine to identify more than one root cause, but do push the group, through reflection and discussion, to narrow the list to no more than three root causes.

Additional Information

Participants frequently disagree about explanations for the original problem, the sequence of causes and effects, or the relative importance of various possible causes during the brainstorming phase of this activity. Rather than allowing debate during the brainstorming of the list, keep the group focused on listing possible reasons first. When the group reflects individually to identify possible root causes, it can move past less important disagreements to focus on the root of the problem.

The group may come up with explanations that are directly contradictory to one another. If this occurs, record them all rather than immediately dismissing any. The reflection and subsequent discussion will sometimes reveal which are more likely to be true.

Example of Partially Completed *20 Reasons* Worksheet

Problem: *Our ELL population struggles to meet proficiency on the ELA section of MCAS.*

#	Possible Explanation	Root Cause?
1	*ELL students have a wide variety of needs and abilities that are difficult to meet.*	
2	*Programs we have for ELLs are not being implemented effectively in every school.*	
3	*Many teachers have not received enough PD and support to help them work with ELLs effectively.*	
4	*Many ELL students also have learning disabilities.*	
5	*The number of ELL students in our schools is increasing faster than we thought.*	
6	*The MCAS requires high levels of comprehension of vocabulary that may be unfamiliar.*	
7		
8	*.*	
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

20 Reasons Worksheet

Problem:

#	Possible Explanation	Root Cause?
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

FISHBONE ANALYSIS 4.2.3T

Purpose	Determine a root cause for a problem.	
Description	A Team works through a formal fishbone diagram to brainstorm and individually rule out possible causes in order to arrive at an agreed upon potential root cause.	
Time	1 hour.	

Related Documents
4–Knowledge Module
4.2.1T: Why, Why, Why?
4.2.2T: 20 Reasons
4.2.4T: Graphic
　　　　 Representation
4.2.5T: Dimensions Bulls-
　　　　 Eye

Directions: Follow these steps to complete the fishbone diagram.

1. Write your problem in the box at the ―head" of the fish.

2. Identify major categories and write them in the boxes. (The diagram has four ―ribs" and boxes, but you may have fewer or more than that. The first time you use this tool, try to use four.)

3. For each major category, brainstorm possible causes. Write them next to the appropriate ―rib" of the fish.

4. Analyze each possible cause identified to determine whether it is a root cause by asking:

   ♦ Would the problem have occurred if the cause had not been present?

   ♦ Would the problem reoccur if the cause was corrected?

   If the answer to both of these questions is no, you have found a likely root cause.

5. Place checkmarks next to ideas that are not root causes.

6. Circle root causes.

Key Point

▶ The categories used most often when addressing problems in student achievement are Students, Families, Processes, Curriculum, and Teachers, but categories may vary depending on the problem.

Additional Information

During the brainstorming, participants may come up with possible causes that do not fit easily into one of the previously identified categories. This can indicate a need to identify a new category or broaden an existing category. Do not discard an idea solely because it does not fit into a previously identified category. The purpose of the major categories is to provide a structure to guide the brainstorming. These categories should be used to inspire, rather than restrict, participants' thinking.

In the early stages of the process, participants often use the activity as an opportunity to vent frustrations and criticisms. This can be acceptable in the beginning, but be sure to steer them in a more constructive direction as the activity progresses.

Example of Completed *Fishbone Diagram*

Families

Do not speak English at home

Parents do not help students at home

Poverty

Parents do not accept help

Parents do not come to conferences or ask for help

Students

They don't try hard enough

Students don't like school

Do not behave well enough in class

Students miss school too much

Students don't participate enough

Our ELL population struggles to pass the ELA section of MCAS.

Kids are allowed to fall through the cracks

Inconsistent implementation of programs

Teachers feel overwhelmed

Class sizes are too large

We have not changed with the change in population

Not enough ELL specialists

Not enough materials

We treat many students the same even though their needs are different

Every school seems to be doing something different

Some teachers do not have experience with ELL students

Not enough professional development

Processes

Teachers

Fishbone Diagram Worksheet

Problem:

GRAPHIC REPRESENTATION   4.2.4T

Purpose	Determine a root cause for a problem.
Description	A group works together to design a graphic representation of a problem and the processes that surround it to identify areas of strength and weakness to address, including potential root causes. This technique enables a group to discuss, analyze, and display relationships among factors, so members can simultaneously see the big picture and the fine details it's comprised of. This highly collaborative technique works best with groups of up to five people.
Time	90 minutes to 2 hours.

Related Documents
4–Knowledge Module
4.2.1T: Why, Why, Why?
4.2.2T: 20 Reasons
4.2.3T: Fishbone Analysis
4.2.5T: Dimensions Bulls-
        Eye

Directions: Use the following steps as guidelines in developing and reflecting on a graphic representation about a problem or situation. Bear in mind that the steps are intended as a reminder to help you through the process. In practice, the process is less linear than this sequence of steps implies. To complete this activity, you will need chart paper, markers, and sticky notes.
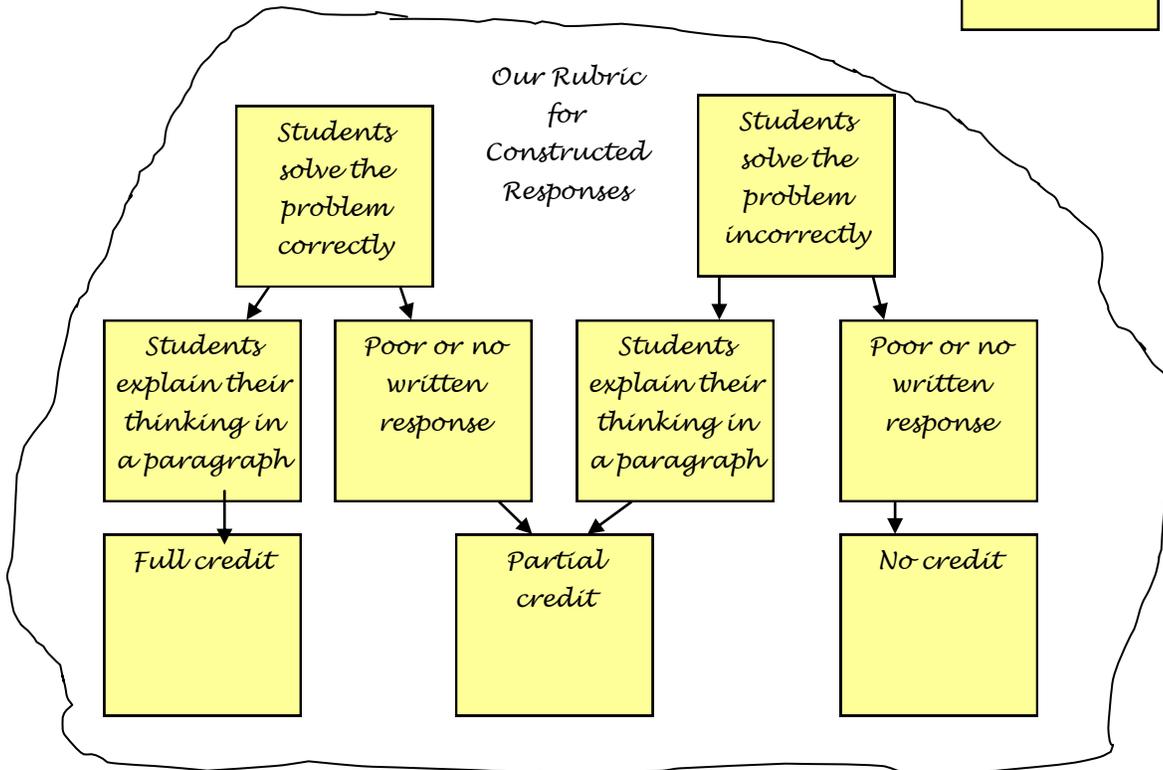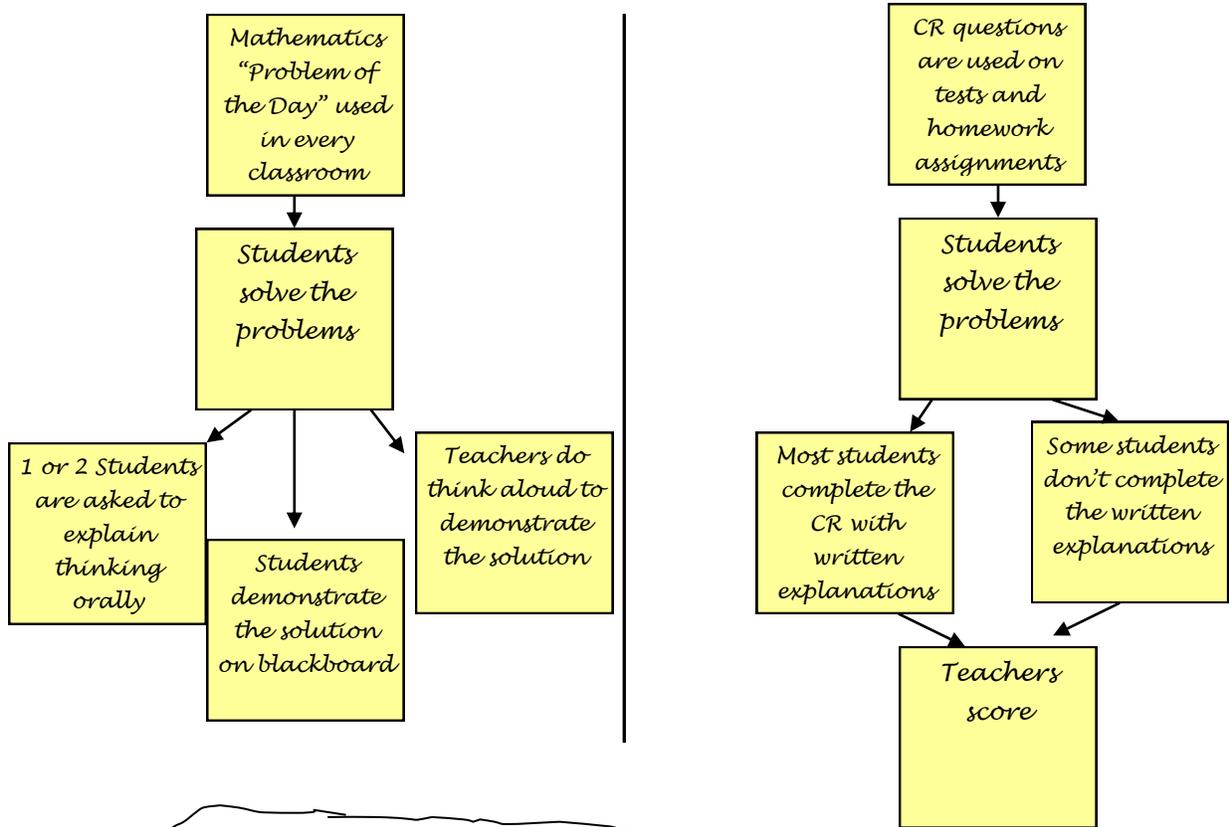
1. Identify a problem and write it on chart paper.

2. Working independently, brainstorm factors that influence the situation and write them on sticky notes. (Allow approximately five minutes).

3. Compare and discuss the factors suggested by different members of the team, adding, discarding, and revising factors as needed.
   - Look for duplicates. A factor that was suggested by multiple members is likely to be relevant and important. Select one and discard the others.
   - Look for similarities and consider combining ideas that are similar, but not exactly the same.
   - Refine ideas that are imprecise.
   - Consider whether each factor is too specific or too general.
   - Debate and decide whether each factor is relevant.

4. Arrange the sticky notes on the chart paper in a pattern that indicates how the factors are related.
   - Cluster related ideas.
   - Discuss their relationships.
     - Does one have a strong impact on another?
     - Which is the cause and which is the effect?
     - Do two or more factors combine to affect another factor or group of factors?
     - Are two or more factors influenced by another factor or group of factors?
   - Arrange the sticky notes to show the relationships.

5. Experiment with different arrangements for the sticky notes. Once the team has reached consensus on an arrangement for all the factors, draw circles and arrows on the chart paper to clarify the relationships.

6. Study the entire graphic representation with a critical eye, asking questions such as:
   ♦ Are the relationships between variables shown correctly?
   ♦ Are there other variables or issues that should be added?
   Revise and refine the overall arrangement based on the answers.

7. Focus on each relationship individually, asking such questions as:
   ♦ Do we know for certain that these factors are related in this particular way?
   ♦ What evidence do we have that enables us to make this conclusion?

8. If there are relationships that you believe are valid and important, but you cannot be certain that they are, list them on another piece of chart paper and note how you could investigate them further.

9. Study the graphic representation and identify factors on which to focus solutions by asking such questions as:
   ♦ Which factors seem to be at the root of the problem?
   ♦ Would a significant change in one or two factors solve the problem?

Adapted from *How To Conduct Collaborative Action Research*, by Richard Sagor, 1992, ASCD, Alexandria, VA.

Graphic Representation Example

Many of our students score poorly on constructed response (CR) questions in mathematics.

Mathematics "Problem of the Day" used in every classroom

↓

Students solve the problems

→ 1 or 2 Students are asked to explain thinking orally

↓ Students demonstrate the solution on blackboard

→ Teachers do think aloud to demonstrate the solution

CR questions are used on tests and homework assignments

↓

Students solve the problems

↓ Most students complete the CR with written explanations

↓ Some students don't complete the written explanations

↓

Teachers score

Our Rubric for Constructed Responses

Students solve the problem correctly

↓ Students explain their thinking in a paragraph

↓ Poor or no written response

Students solve the problem incorrectly

↓ Students explain their thinking in a paragraph

↓ Poor or no written response

Full credit

Partial credit

No credit

DIMENSIONS BULLS-EYE   4.2.5T

Purpose	Determine possible root causes for a problem.
Description	This protocol will help a Team brainstorm possible root causes, sort them into one of three dimensions, and prioritize key root causes for action.
Time	1–2 hours.

Related Documents
4–Knowledge Module
4.2.1T: Why, Why, Why?
4.2.2T: 20 Reasons
4.2.3T: Fishbone Analysis
4.2.4T: Graphic
      Representation

Note: This activity is an adaptation Step Four of the Performance Improvement Mapping (PIM) process—*Identify the most significant causes of the weaknesses in students' knowledge and skills*—available at http://www.doe.mass.edu/sda/regional/pim/.

Directions:

1. Write the inference or conclusion from your data analysis (*3.3.1T*) where all can see, e.g., flip chart or projected by an LCD.

2. Brainstorm all the possible underlying causes that might have contributed to this outcome. For each potential root cause, write a short summary on a piece of paper and tape it on the wall where everyone can see and read it.

   Note:

   - The group may want to give individuals silent think/work time before brainstorming as a group.

   - Make sure that the written causes are specific enough to be interpreted after the discussion is over. For example, a cause written as curriculum does not describe what really is lacking.

3. Once the brainstorm is complete, consolidate any duplicate or very similar ideas. However, avoid consolidating causes in ways that make them too broad and vague.

4. Review all the causes and note any that are outside of the direct control of the district, e.g., those dealing with student behavior, families, or the community. For each of these causes, discuss the following:

   - Is this potential root cause important enough for the district to focus time and energy on as part of an action planning process?

   - If so, can this cause be stated in terms of something over which the district has control?

   After discussing each of these causes, the Team has two options:

   - Rewrite the cause in terms of actions the district could take, such as securing resources, modifying processes, and/or shifting actions of district personnel. (See examples below).

- Put the cause aside to be dealt with at another time (Remove it from the wall and record it on a ₋waiting room" list. The Team may want to discuss this list at a later time with district leadership, the School Committee, Union leadership, and/or community partners).

Examples of rewritten causes:

Problem	Brainstormed Root Cause	Rewritten and Refined Cause
Students do not know how to read grade level text fluently and with comprehension (7.10)	Students' families don't read to them at home.	**The district lacks supplementary reading interventions** for students who do not make adequate progress through regular classroom instruction.
Students do not know how to estimate and compute with fractions, including simplification of fractions (8.N.10)	Special education students refuse to memorize the rules for computations involving fractions.	**Special education teachers lack a variety of strategies** for teaching computational skills involving fractions.

5. Once all causes have been written in terms that represent things over which the district has control, sort them into one of three dimensions by moving the papers on the wall. It may help to have a separate flip chart or wall space designated for each realm.

- **Core realm**: Contains factors that most directly affect student outcomes. These tend to be classroom-level factors.

- **Enabling realm:** Contains conditions that *must* be in place in order to make the core elements successful in affecting student outcomes. These tend to be a mix of school- and district-level factors.

- **Supporting realm:** Contains conditions that are *helpful* toward making the core elements successful in affecting student outcomes. These tend to be a mix of district- and community-level factors.

Note that the amount of control that teachers and the school have is greatest at the center. Conversely, district control is greatest in the enabling and supporting realms. The district has the unique perspective, responsibility, and authority to act at the enabling and supporting levels in order to make systemic improvements that affect student learning and achievement.

Dimensions of district improvement:

Realm	Definition	Sphere of Implementation	Amount of School and Teacher Control	Amount of District Control
Core	Factors that most directly affect student outcomes	Classroom	School and teachers have a great deal of control	District has responsibility, but less direct control
Enabling	Conditions *necessary* in order to make activities in core realm successful	School	School has some control	District has significant control and leverage
Supporting	Conditions that are *helpful* in making activities in core realm successful	District/ Community	School has little control	District has some control and leverage

6. Once all potential root causes are sorted, review the enabling and supporting dimensions. If there are very few causes in either of these categories, ask the Team to consider what other factors might affect the problem the Team is investigating and add any new ideas to the list.

Stop: If the data analysis in *3.3.1T* yielded multiple conclusions, repeat this process for the other conclusions (problems) before proceeding further.

7. Once the Team has generated and sorted potential root causes for each of the conclusions, look across all the causes and ask:

    - Are there any issues that arose in one brainstorm that are similar to those in others, suggesting they affect multiple areas within the district?

    - Do these causes primarily affect a subgroup of students, teachers, or other stakeholders, or do they affect a much wider segment of the population we serve?
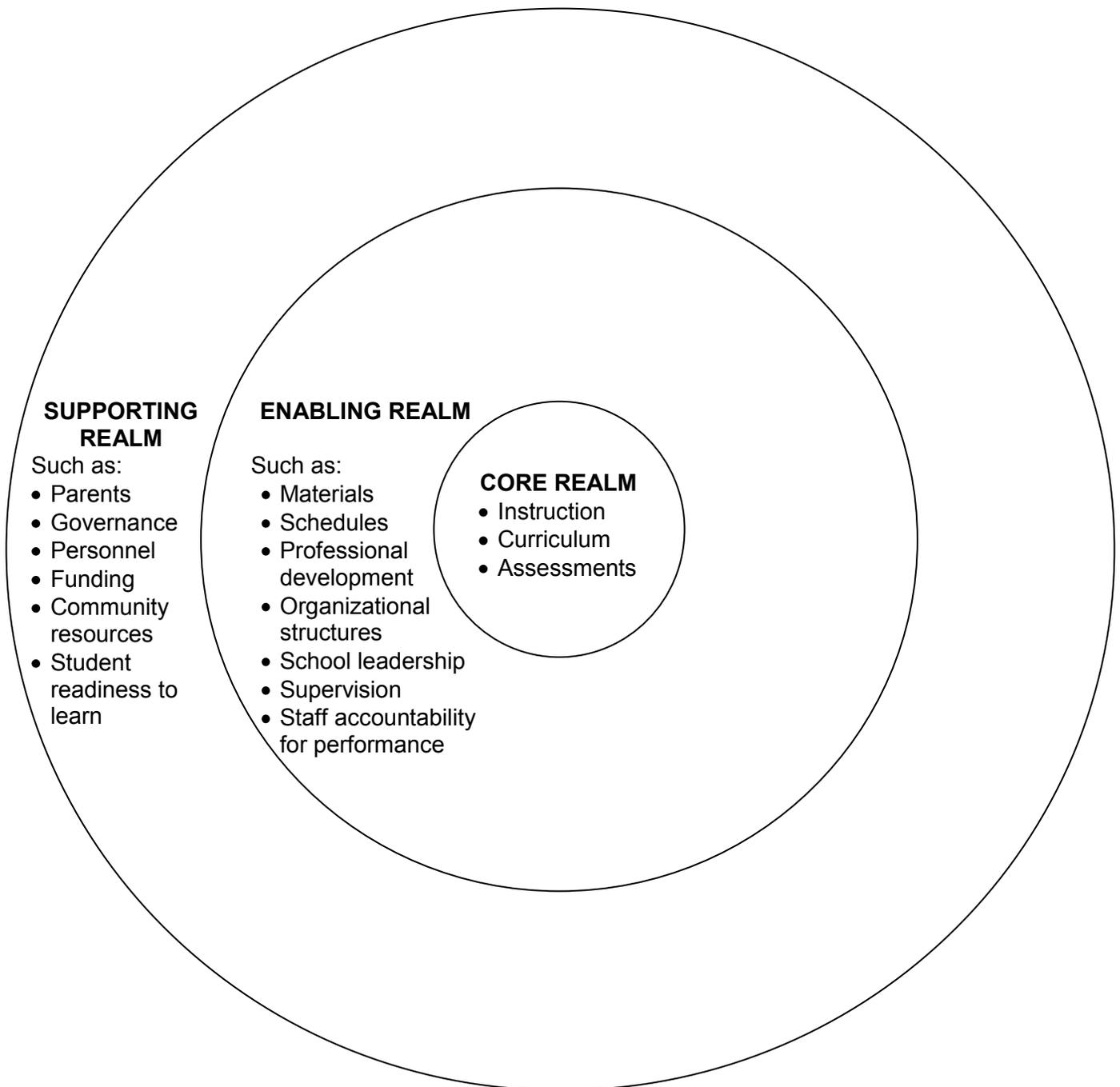
    Consolidate the issues that affect multiple areas or stakeholders. Record these in worksheet *4A: Far-Reaching Causes*, and record the remainder in *4B: Problem-Specific Causes*.

It would be impractical to address all of the causes identified. Therefore, narrow the list of causes to identify those which can be addressed most productively by the district.

8. Rate each cause based on the impact it is likely to have on student learning and achievement, and on the amount of control the district has over it. Causes that rate high on the amount of impact and the amount of district control should become the focus of subsequent action planning.

Dimensions of District Improvement

- **Core realm:** Contains factors that most *directly affect* student outcomes: instruction, curriculum, and assessments.

- **Enabling realm:** Contains conditions that *must* be in place in order to make the core elements successful in affecting student outcomes.

- **Supporting realm:** Contains conditions that are *helpful* toward making the core elements successful.

SUPPORTING REALM

Such as:
- Parents
- Governance
- Personnel
- Funding
- Community resources
- Student readiness to learn

ENABLING REALM

Such as:
- Materials
- Schedules
- Professional development
- Organizational structures
- School leadership
- Supervision
- Staff accountability for performance

CORE REALM
- Instruction
- Curriculum
- Assessments

Adapted from: Conley, David T. (1997). *Roadmap to restructuring: Charting the course of change in American education*. Eugene, OR: Clearinghouse on Educational Policy and Management

4A: Far-Reaching Causes

Record the potential root causes that apply to *a number* of identified problems, function areas, or groups of stakeholders.

Guiding Questions:
1. Which potential root causes have the greatest impact on the work of the district?
2. Which causes does the district have the most immediate control over?
3. What evidence does the Team have to verify its theories about why this problem exists?

Potential Root Cause	Impact on student achievement 1 = minimal 2 = some 3 = substantial	District's control 1 = very little 2 = some 3 = a lot	Evidence

Worksheet 4B: Problem-Specific Causes

Use this worksheet to record the potential root causes that apply to *only one* identified problem, function area, or group of stakeholders. Be sure to indicate the target for each potential root cause.

Guiding Questions:
1. Which of these potential root causes have the greatest impact on the work of the district?
2. Which causes does the district have the most immediate control over?
3. What evidence does the Team have to verify its theories about why this problem exists?

Problem, function area, or stakeholder group	Potential Root Cause	Impact on student achievement 1 = minimal 2 = some 3 = substantial	District's control 1 = very little 2 = some 3 = a lot	Evidence

PROBLEM INVESTIGATION PLAN   4.3.1T

Purpose	To structure a research effort aligned with a problem.
Description	This document serves as a way for a Data Team to identify questions that need to be answered about a problem being addressed in the Data-Driven Inquiry and Action Cycle.
Time	30 minutes.

Related Documents
4–Knowledge Module
4.3.2R: Educational
      Research
      Websites

Directions:

1. Restate the underlying problem and proposed solution articulated in the *Problem Statement*.

2. As a group, brainstorm questions about the problem or proposed solution that should be checked before moving forward. It can be useful to note the underlying assumptions the group has, e.g., that a certain factor is the most significant root cause, or that a certain solution will have the greatest impact, and translate those into a question for investigation. If the list is long, the Team may want to prioritize them.

3. For each question, complete the information below until all are captured and a clear plan to investigate each is identified. Copy the table as many times as necessary to document how the Team will address each question it has about the problem or solution. It is not necessary to consult both research *and* local expertise for each question.

Example:

Problem or solution under investigation: *Teachers don't get sufficient training and support in our reading program, so we are going to start a teacher mentoring program.*

Question we have:	What other districts similar to ours have implemented mentoring programs focused on reading, and how well did they work?	**Lead Investigator:**
Research sources to consult:	Local university teacher training department Regional Laboratory Reference Desk	District teacher developer
Local expertise to consult:	MA ESE Literacy Office Collaborative of districts Principal and coach at a high-performing school in our district	District literacy director
Date for completion:	Three weeks from now	

Problem or solution under investigation: _____

Question we have:		Lead Investigator:
Research sources to consult:		
Local expertise to consult:		
Date for completion:		

Question we have:		Lead Investigator:
Research sources to consult:		
Local expertise to consult:		
Date for completion:		

Question we have:		Lead Investigator:
Research sources to consult:		
Local expertise to consult:		
Date for completion:		

Question we have:		Lead Investigator:
Research sources to consult:		
Local expertise to consult:		
Date for completion:		

EDUCATIONAL RESEARCH WEBSITES   4.3.2R

Purpose	To connect districts to websites with searchable educational research reports.
Description	This list can serve as a starting place for gathering researched reports related to the problem the Team is addressing and interventions the Team is considering.
Time	N/A.

Related Documents
4–Knowledge Module
4.3.1T: Problem
       Investigation Plan

	Website	Brief Description
1	http://www.eric.ed.gov/	**ERIC**—Education Resources Information Center; a federal site for collected educational resources, including research.
2	http://ies.ed.gov/ncee/wwc/	**What Works Clearinghouse**—A website operated by the Institute for Education Sciences to provide "a central and trusted source of scientific evidence for what works in education."
3	http://ies.ed.gov/pubsearch/	**IES REL Network**—Institute for Education Sciences search engine for publications, including research from 10 Regional Education Laboratories.
4	http://www.relnei.org/referencedesk.2009-12-31.php	The **Regional Educational Laboratory Northeast and Islands (REL-NEI)** is part of the Regional Educational Laboratory Program. The REL-NEI Reference Desk is a free service that provides quick-turnaround responses to education-related research questions, offering a quick scan of existing research.
5	http://edadmin.edb.utexas.edu/datause/index.htm	**U. of Texas at Austin: Data Use Website**—Dept. of Educational Administration, College of Education; includes publications; site developed by Chief Data Champion Jeffrey Wayman.
6	http://www.sedl.org/	**SEDL**—(formerly the Southwest Educational Development Laboratory); a private, nonprofit education research, development, and dissemination (RD&D) corporation based in Austin, Texas.
7	http://www.rtinetwork.org/	**RTI Action Network**—A program of the National Center for Learning Disabilities.
8	http://www.ideapartnership.org/journals.cfm	**The IDEA Partnership**—Reflects the collaborative work of more than 55 national organizations, technical assistance providers, and organizations and agencies at state and local levels. Click on "MANY VOICES" to find hundreds of articles and citations from web-based journals and other periodicals; they are building a larger online library to open in March 2010.
9	http://www.promisingpractices.net	**Promising Practices Network**—RAND corporation's website, whose stated purpose is "providing quality evidence-based information about what works to improve the lives of children, youth, and families." All of the information on the site has been screened for scientific rigor, relevance, and clarity.

PROBLEM CATALOGUE TEMPLATE 4.4.1T

		Related Documents
Purpose	To give the District Data Team a systematic way to capture problems.	4–Knowledge Module
Description	This template contains a model for a catalogue of problems being addressed by groups throughout a district.	
Time	Ongoing.	

Problem Catalogue

Problem ID Number	Problem Keywords	Full Problem Statement (or summary)	Subject Area(s)	Academic Content Standard(s)	Team Investigating	Date Begun	Date Completed	Results Available (location)
0	K–5, ELA, Mentoring, Training, Assessment	• Many third grade students at our school do not read at grade level. • We believe that this is a result of teachers not having sufficient training in our reading program and not accurately measuring students' reading levels in grades K–3. • We want all third graders at our school to read at grade level or above. • We will start a teacher mentoring program focused on reading and implement more rigorous reading assessments in the primary grades.	ELA	N/A	Reading Intrervention	13-Jan-09		Reading Intervention
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35								

Collected Research and Practice Literature: Articles and Sources

Associated Problem ID Number(s)	Associated Problem Keywords	Title of Article, Study, or Other Item	Source: Publisher or Website	Location or Person with Copies Available?	Date Added to this List
0	K–5, ELA, Mentoring, Training, Assessment	[Article Title 1]	[Website link]	Online	2/8/2010
0	K–5, ELA, Mentoring, Training, Assessment	[Article Title 2]	[Publisher name]	Central comptuer network drive	1/13/2010
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Collected Research and Practice Literature: Articles and Sources

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District Data Team Toolkit

MODULE 5: ACTION

Table of Contents

Tools and Resources for Action

5.1.1T: Logic Model Template	5.2.2R: Elements of a Well-Written Measure
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5.2.1T: Crafting Meaningful Measures Checklist	5.3.2T: Action Plan Checklist

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INTRODUCTION

WHERE ARE WE NOW?

The District Data Team Toolkit is based on the Data-Driven Inquiry and Action Cycle. The Cycle provides the structure that takes data use within the district from asking the right questions to getting results. It is an iterative process in which the district acts on data to support continuous improvement. The Toolkit uses the steps of the Cycle to structure a progression through the model—you are now in **Module 5: Action**.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Getting Ready	Inquiry	Information	Knowledge	Action	Results

If a District Data Team has progressed through this Toolkit in sequence, it began by forming a focusing question and presented a data overview related to this question (*Inquiry*). The Team then gathered additional data to answer clarifying questions (*Information*) and identified an area to be acted upon (*Knowledge*). Then it consulted the research literature and local practice to identify one or more strategies to address the identified problems. This module will help the Team craft a logic model that illustrates how and why the strategies will work. It will also help the Team create action plans, if needed, to implement the strategies.

MODULE OBJECTIVES

The **Action** module will help a District Data Team:

▶ Craft a logic model or theory of action to guide subsequent action and evaluation

▶ Articulate meaningful measures of implementation and change

▶ Develop action plans, if necessary, to implement new strategies or to implement existing strategies more effectively

CRAFTING A LOGIC MODEL

WHY DEVELOP A LOGIC MODEL?

Internal stakeholders will want to know what their roles and responsibilities will be in implementing these strategies. External stakeholders must be convinced that the proposed changes are compelling.

Now that the District Data Team has selected the strategy or strategies it will employ to address the identified problems, it might be tempting to move directly to the implementation phase. However, whether the Team identified new strategies or proposed to leverage existing ones, it must be able to justify to internal and external stakeholders how and why the allocation of these resources will have the intended impact on the skills, knowledge, and behavior of the targeted adults and students.

Internal stakeholders, i.e., the district leadership team, central office staff, principals, and teachers, will want to know what their roles and responsibilities will be in implementing these strategies. *External stakeholders,* i.e., the school committee, parents and families, state education agencies, and the public, must be convinced that the proposed changes are compelling, will result in rapid improvement, and will use resources effectively.

A logic model articulates to these internal and external stakeholders, in plain language, the connections among the selected strategies, needed resources, intended outcomes, and desired impact on goals at the district, school, or classroom levels.

Compelling logic models:

▶ **Show cause and effect.** The model succinctly communicates that *given x strategies and resources, we expect y and z to occur as a result*.

▶ **Are bold yet achievable.** Taken as a whole, the strategies are likely to lead to ~~im~~proved results for students, long-term gains in school and school system capacity, and increased productivity and effectiveness" in the targeted areas.[1]

▶ **Give implementation and outcome measures.** The model describes the changes that the strategies, when effectively implemented, will have on the skills, knowledge, and behavior of adults and students in the system.

COMPONENTS OF A LOGIC MODEL

A typical logic model has the following components:

INPUTS			OUTPUTS	OUTCOMES	IMPACT
Problem Statement(s)	Strategies	Resources	Measures of Implementation	Measures of Change	Goals

- ▶ **Inputs** consist of:

    - A **problem statement(s)** that sets the context.

    - **Strategies** that outline a course of action and answer the question: *what are the specific means, methods, or approaches we will use to solve the problem(s) we identified?*

    - The identification of key **resources** needed to support successful implementation of the strategies.

- ▶ **Outputs**, or **measures of implementation**, communicate if the adults involved have implemented key action steps.

- ▶ **Outcomes,** or **measures of change,** communicate if the adults and students involved have acquired and are applying the skills, knowledge, and expertise needed to achieve the goals of the initiative.

- ▶ **Impact,** or **goals,** articulates the goal for improvement and long term impact, long-term, sustainable effects the district expects to see as a result of the model.

Each component is explicitly tied to the others. However, it is not necessary to have a one-to-one relationship between items in one column and items in the next. For example, a district may develop a logic model with 3 strategies, 12 essential resources, 5 key measures of implementation, and 3 key measures of change, in order to reach 1 goal.

The resulting model gives the reader a clear sense of how the district perceives the problems it identified, the strategies selected to address those problems, the supports needed to implement those strategies successfully, and the outputs and outcomes that should occur if the strategies are implemented effectively.

BUILDING A LOGIC MODEL

In completing the logic model, the Team does not proceed from left to right, but does a form of backward mapping. The Team begins by naming the problem and proposed solutions, articulates the impact, names the outcomes indicating progress toward that goal, and then returns to the inputs to complete the model. The numbered columns below show the progression:

1	4	5	6	3	2
INPUTS			**OUTPUTS**	**OUTCOMES**	**IMPACT**
Problem Statement(s)	Strategies	Resources	Measures of Implementation	Measures of Change	Goals

Adapted from: W.K. Kellogg Foundation (2004). *Logic Model Development Guide*. Battle Creek, MI: Author.[2]

1. The Team begins by providing a **problem statement** (or statements)—a brief description of the problem it wants to address, including naming the nature of the problem, the stakeholders who are most affected by the problem, and the suspected cause of the problem, based on rigorous analysis. This statement should be based on rigorous data analysis and/or root cause analysis. It should represent what the Team thinks is the most significant cause(s) contributing to the problem. *What, if addressed, would make the greatest impact on resolving the problem?* It may be helpful to reference specific evidence.

   If the Team has completed *4.1.1T: Writing a Problem Statement,* then its work for this and other sections of the logic model will already be complete.

2. Next the Team articulates the overall **goals** the initiative is intended to accomplish or, stated another way, the impact the initiative will have on the culture of the district, its schools, or its classrooms. This section describes the wishes, dreams, and general vision describing the target, the sustained effects, or consequences the district expects to see over a multi-year period. The Team should seek the support of the superintendent in developing appropriate goal statements because they should align with the district's strategic goals. (These can also be drawn from *4.1.1T*).

3. Having identified the impact of the initiative, the district articulates the outcomes, or **measures of change** (or outcomes) that indicate progress is being made toward those goals. These measures provide evidence of shifts in the skills, knowledge, and behavior of the adults and students targeted by the strategies. They articulate in specific and measurable in terms *what will change, for whom, by how much, and by when.*

> ▶ *For adults*, these measures demonstrate how teachers, principals, and/or district personnel will approach their work differently as a result of the actions taken.

> ▶ *For students*, these measures demonstrate the extent to which the shifts in adult practice are having an impact on their learning and achievement.

These measures often describe things that can be hard to quantify easily and effectively. Yet well-defined measures can provide a powerful focus for all involved in the effort. As the maxim goes, *what gets measured gets done.*

The Team should articulate both short- and long-term outcome measures that will demonstrate progress toward the goal, rather than rely solely on data collected once the strategy is fully implemented. A diverse array of measures will provide a richer picture of the effect of the strategy than measures that capture similar evidence. The Team may want to consider collecting outcome data related to the four domains introduced in *Module 1: Getting Ready*—demographics, perceptions, and school (or district) processes, as well as student outcomes.[3]

> **A** diverse array of measures will provide a richer picture of the effect of the strategy than measures that capture similar evidence.

The section *Articulating Meaningful Measures* later in this module provides more guidance for creating and refining these measures.

4. Once the Team has clearly articulated its outcomes, it then goes back to the second column and lists its **strategies**—the specific means, methods, or approaches to solving the identified problem(s). These should represent promising practices drawn from research, local knowledge, and local expertise. Sources should be noted if possible. (These can also be drawn from *4.1.1T* if the Team has completed it).

Strategies may include:

> ▶ *Policies*, such as student discipline and suspension policies, or those related to developing and retaining an effective, academically capable, diverse, and culturally competent educator workforce.

> ▶ *Structures*, such as time in the schedule for common planning or technology and other infrastructure.

> ▶ *Systems*, such as the district's method of screening the reading skills of entering students, as well as the many central office processes that support school operations.

> ▶ *Curricula*, such as pacing guides, textbooks, and supplementary materials.

> ▶ *Instructional strategies*, such as the use of graphic organizers to organize details in a story; grouping strategies; and the use of formative assessments to gauge student performance on a specific skill.

Strategies may range from relatively large initiatives, such as aligning professional development to the district's improvement plan, to small actions, like the use of particular teaching techniques in the classroom. It is important to consider what degree of specificity is needed to address the identified problem, given its size and scope. If the proposed strategy (or strategies) is either too broad or too narrow in relation to the problem it is addressing, it is unlikely to be useful in generating the desired impact. It will also be harder to convince internal and external stakeholders *how* the strategy will address the issues identified.

As stated earlier, a single strategy is unlikely to achieve the district's goals or withstand external scrutiny. Typically a combination of strategies implemented in coordination is required to address the problem statement.

In deciding on the strategies to reach the desired goal, first consider what strategies are already in place, and consider the value of continuing or refining these before creating any new strategies. The *Inventory of District and School Initiatives (Activity 2.2.1)* may be useful for this step.

5. What the Team identifies for **resources** answers the question: *What supports are available to the district or our schools to implement our strategies?* While the most obvious resource is funding, a district's primary resource is its personnel. The Team should consider: *How is the time of teachers, administrators, and support staff throughout the district being used, and how might it be used differently to address the strategy or strategies?*

Other resources include technology, materials, systems, infrastructure, polices, political support, and partnerships with organizations like the Department itself.

In identifying these resources, the Team is making a commitment to allocate them, protect them, and prioritize their use in service of these strategies.

6. **Measures of implementation** (or outputs) communicate how the reader of the plan will know the strategy or its key action steps are carried out and if so, to what extent. These measures generally apply only to the adults in the system, and not to the students. They answer the questions *what will take place, with or for whom, to what extent, and by when?* These measures tend to be more concrete, discrete, and more easily quantified than the measures of change.

The *Logic Model Template* provides a framework for documenting the Team's work. The *Logic Model Checklist* can assist the Team in reflecting on the strength of its logic model and the degree to which it will help drive the work forward.

The next section, *Articulating Meaningful Measures,* provides more guidance for refining these measures.

Activity 5.1 Crafting a Logic Model

These tools will guide the District Data Team in crafting and refining a logic model to guide implementation and evaluation of its strategies.

(5.1.1T: Logic Model Template)
(5.1.2T: Logic Model Checklist)

ARTICULATING MEANINGFUL MEASURES

It is critical that the District Data Team clearly and meaningfully articulate measures of implementation and measures of change, as they will serve a number of functions. For example, these measures–also known as indicators or benchmarks–can be used to:

▶ Guide and inform the work and subsequent evaluation

▶ Provide a range of evidence for analysis and triangulation with other data sources

▶ Inform mid-course corrections, if needed

▶ Support the ability of the Team to communicate successes and needs to stakeholders on an ongoing basis.

In crafting its measures of implementation and change, the District Data Team is essentially deciding what will be evaluated. Since the measures that are articulated will be used to monitor progress, it is important to articulate only those measures whose evidence will be collected and analyzed.[1] The Team should not identify a measure if the evidence it would generate does not relate directly to an evaluation question.

In deciding what to evaluate, and therefore what to measure, the Team might consider:

▶ What are the questions internal and external stakeholders (including the Team itself) want to have answered?

▶ How will the information be used, and by whom?

By reflecting on these questions, a Team can narrow the focus and scope to those measures that will best document and communicate progress toward outcomes and impact.

As mentioned earlier in this module, measures of change in particular often describe things that can be hard to quantify easily and effectively. However, well-defined measures can provide a powerful focus for all involved in the effort.

> **W**ell-defined measures can provide a powerful focus for all involved in the effort.

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[1] See *Module 6: Results* for more information on the evaluation process.

Measures of Implementation… (Outputs)	Measures of Change… (Outcomes)
Answer: *What will take place, for whom, to what extent and by when?*	Answer: *What will change, for whom, by how much, and by when?*
Focus primarily on adult actions	Address both the adults and the students involved in the strategy
Focus on the short term	Focus on the intermediate and long term
Focus on the fairly technical aspects of the work *(such as ensuring all teachers receive a particular training, or that a certain number of students are enrolled in a program)*	Focus on elements that are less tangible, such as the acquisition of skills and knowledge, or the shifting of habits and beliefs *For adults*, these measures demonstrate how teachers, principals, and/or district personnel will approach their work differently as a result of the actions taken *(such as teachers implementing new techniques from a training)* *For students,* these measures demonstrate the extent to which the shifts in adult practice are having an impact on their learning and achievement. *(such as students shifting their aspirations)*
Are used to monitor if things got done Communicate whether implementation of the strategy or strategies is taking place as desired	Are used to monitor if actions are having the intended effects Communicate whether implementation is expanding capacity and resulting in positive outcomes
	Help determine whether particular strategies or initiatives should be continued, expanded, or discontinued On a larger scale, these measures can help prove whether the district's theory of improvement, as articulated in its logic model, is sound and effective
Internal stakeholders are the primary audience, e.g., the Team itself and those directly involved with the action plan	External stakeholders are the primary audience, e.g., other district personnel, as well as the wider community

The Team should articulate short-, intermediate- and long-term measures (sometimes known as formative and summative measures) that span a progression of time and that will demonstrate progress toward the goal.

Similarly, the Team should embed into its work the means to collect, monitor, and evaluate the evidence generated by these measures, rather

than waiting until implementation is complete to begin that process. In specifying these measures, the Team is making a commitment to engage with the evidence in an ongoing way to see what can be learned and to make changes to the operating plan in mid-course, if necessary.

For a useful mnemonic device to follow in developing indicators, consider SMART:

► **S**pecific: What are the specific criteria against which the outcome will be judged?

► **M**easurable: What will be the method or tool used to measure progress?

► **A**ction-oriented: Is there consensus among stakeholders that this is a worthy outcome?

► **R**ealistic: Is this outcome sufficiently bold, yet still achievable given available resources, knowledge, and time?

► **T**imed: Does the indicator specify by when the outcome will be achieved?

Evidence for these measures, like other data, comes in a variety of forms. The Team might consider articulating data that represent the four domains of data outlined in *Module 1: Getting Ready*—demographics, perceptions, and school or district processes, as well as student outcomes. Another way to think of it is to consider data that can be counted (such as assessment data), seen (such as classroom observation data), and heard (such as stakeholder feedback).

A diverse array of measures will provide a richer picture of the effect of the strategy than measures that capture the same or similar evidence, and will facilitate self-monitoring and measurement of success in each area. Sample measures include:

- Achievement, assessment, improvement, and percent completion data

- Stakeholder perceptions, such as a survey of teachers, administrators, school committee, students, and/or families

- Self-assessments, such as the Common Planning Time self-assessment or Essential Conditions rubric[2]

- Observation data, such as *Learning Walkthrough* evidence

> **A** diverse array of measures will provide a richer picture of the effect of the strategy than measures that capture the same or similar evidence, and will facilitate self-monitoring and measurement of success in each area.

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[2] For more information on these and other district support resources, visit *http://www.doe.mass.edu/sda/ucd/* or email *districtassist@doe.mass.edu*.

- Organizational data

- External review data (such as MASBO or PQA)

For further guidance on crafting meaningful measures, see the attached checklist and resources.

Sample measures include:

▶ **Measure of Implementation**: By May of 2010, 50 percent of middle school mathematics teachers will have received professional development in developing algebraic thinking. By the start of SY 2010–2011, 95 percent will have been trained.

▶ **Measure of Change (for adults)**: Within six months of receiving training, 75 percent of mathematics teachers will be observed implementing the material introduced in the training, as evidenced by data collected through *Learning Walkthroughs* and feedback forms completed by instructional coaches.

▶ **Measure of Change (for students)**: Across the district's elementary schools, the number of students reaching grade level benchmarks for demonstrating algebraic thinking, as measured by a district-wide common assessment, will increase by 20 percent between November 2010 and February 2011.

Activity 5.2 Elements of a Well-Written Measure

These resources can help the Team articulate meaningful measures. The first document is a checklist to guide the creation or revision of a measure. The second resource provides an example of how a measure can be made stronger and more informative, and provides sample scenarios to give the Team practice articulating measures.

(5.2.1T: Crafting Meaningful Measures Checklist)
(5.2.2R: Elements of a Well-Written Measure)

PUTTING IT ALL TOGETHER

Once the Team articulates the six components of a logic model, the resulting document, when read from left to right, represents the district's theory of change—a rationale for what the district believes is the best way to fulfill its mission, vision, and goals. While completing the model can be a long and sometimes difficult process, the result will be increased clarity and agreement on where to focus the time and energy of all involved. A clear logic model can also serve as the basis for evaluation of the district's efforts, which is discussed in *Module 6: Results*.

TAKING ACTION

In developing its logic model, the District Data Team identified a strategy (or, more likely, a set of strategies) that will be used to address the problems it identified. Now the Team is ready to begin taking action.

In some cases, the logic model alone will be sufficient to guide the work and the Team will not need any additional detail. In other cases, an action plan may be useful or even necessary.

WHEN ARE ACTION PLANS NECESSARY?

An action plan is a strategic series of steps designed to ensure that an identified strategy is implemented. For each step, the plan outlines the necessary resources and measures of implementation, as well as an owner who will ensure it is accomplished and a deadline by which the step is expected to be completed.

An action plan can be a valuable resource to:

- Guide the implementation of certain strategies
- Provide a basis for monitoring the progress of those strategies

However, action plans are not always necessary. In some cases, a strong logic model with clear strategies and measures may be all the Team needs to guide implementation and monitoring of the work.

In considering whether or not to craft an action plan, the Team might ask:

- Do action plans already exist for the strategies the Team has identified?
- Would an action plan significantly enhance the district's ability to delegate steps and/or monitor their completion?

Generally speaking, action plans are only required for new strategies or strategies that require changes to function as intended. For example, a district initiating professional development in sheltering instruction for English language learners may need to specify the action steps required to implement the training to make sure it occurs. On the other hand, if walkthroughs were selected as a strategy and the district already uses

walkthroughs effectively to observe classrooms, there is no need to develop an action plan for that strategy.

Also, action plans guide strategy *implementation*. However, they do not give any indication of the *effects* of those actions, and therefore are not adequate for monitoring outcomes. This is done by an evaluation plan, which is discussed in *Module 6: Results*.

If the District Data Team determines that an action plan would be a useful tool for the situation it is addressing, it will want to reference the attached documents that describe the components of an action plan and guide the Team in building one.

Activity 5.3 Crafting an Action Plan

These tools will guide a District Data Team in crafting and refining an action plan to guide its work.

(5.3.1T: Action Plan Template)
(5.3.2T: Action Plan Checklist)

MODULE SUMMARY

Module 5: Action builds the capacity of the District Data Team to craft a logic model that provides a rationale for how the strategies it selected to address the identified problems will work. The logic model is the district's rationale and justification for addressing the problems the District Data Team helped identify. It gives an argument for why existing strategies, given some adjustments, and possibly some new strategies as well, will achieve superior results than in the past. Although the Team may not be the primary author or owner of the district's logic model or action plans, it will certainly play an important support role in their creation.

This module also guides the Team on when and how to develop action plans to support the implementation of these strategies.

However, the logic model is only a theory of improvement. Until it is put to use—and rigorously monitored—the Team may find that certain components need refinement in order to achieve the intended results. Perhaps a strategy was not fully implemented according to the timelines set out in its action plan because it lacked a key resource. Perhaps the evaluation data yielded little change in the skills, knowledge, and behaviors of students or adults. The next module, *Results*, guides the Team in creating an evaluation plan that will prepare it to analyze whether or not the strategies have had the desired impact.

References

[1] Race to the Top Executive Summary, p. 2. U.S. Department of Education. Washington D.C. November 2009

[2] W.K. Kellogg Foundation (2004). *Logic Model Development Guide*. Battle Creek, MI: Author

[3] Bernhardt, V. L. (2004). *Data Analysis for Continuous School Improvement.* Larchmont: Eye on Education.

For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

Purpose	Articulate to internal and external stakeholders–in plain language–the connection between the problem statements identified and the strategies identified to address them.	**Related Documents** 5–Action Module 5.1.2T: Logic Model Checklist
Description	Use the template below, the guidance in the text, and the checklist to craft a logic model that shows the links between the team's ideas about improvement, strategies, resources, outputs, outcomes, and the intended impact on district and/or school practices.	
Time	Varies. 2–3 hours to start, but may take many meetings to refine.	

Directions:

- Follow the numbering sequence below, respond to the guiding questions in each column. For example, begin in the first column by naming the problem and proposed solutions; then jump to the last column and name the end goal (the desired impact) before identifying the measures of change that will demonstrate improved outcomes for adults and students.

- It is not necessary to have a one-to-one relationship between items in one column and items in the next. For example, a district may develop a logic model with 3 strategies, 12 resources, 5 key measures of implementation, and 3 key measures of change, in order to reach 1 goal.

See the text in *Module 5* for additional guidance on completing the logic model.

In crafting the logic model, consider:

- Does the model give a credible chain of events, from strategies through outcomes? Does the model succinctly communicate, *Given x resources and strategies, we expect y and z to occur as a result?*

- Are strategies and outcomes articulated in the logic model compelling? Taken as a whole, are the strategies likely to lead to improved results for students, long-term gains in school and school system capacity, and increased productivity and effectiveness in the targeted areas?

- Does the model give measures of implementation as well as outcomes?

Use *5.1.2T: Logic Model Checklist* to refine the completed model.

5.2.1T and *5.2.2R* provide more detailed guidance for crafting and refining meaningful measures of implementation and change.

District/School Name: _____

Today's Date: _____   **Date Approved by Superintendent:** _____

1 Problem Statements & Proposed Solutions	**4** Strategies	**5** Resources	**6** Measures of Implementation (Outputs)	**3** Measures of Change (Outcomes)		**2** Goals (Desired Impact)
What is our proposal for addressing the problem?	*What are the specific means, methods, or approaches we will use to solve the problem(s) we identified?*	*What supports are available to the district or our schools to implement our strategies?*	*How will we know whether the strategies we described were implemented by the adults?*	*What intermediate and longer-term results do we expect to achieve as measured by changes in skills, knowledge, and behavior?*		*What are the sustained effects or consequences we expect to see over a multi-year period?*
				Adults	*Students*	

LOGIC MODEL CHECKLIST

5.1.2T

Purpose	To help a Team refine or revise a logic model that will articulate its theory of action for addressing an identified problem.		**Related Documents** 5–Action Module 5.1.1T: Logic Model Template
Description	This checklist can guide a District Data Team in designing or refining a logic model to guide its action and evaluation plans.		
Time	1–2 hours.		

District/School Name: _____ **Date:** _____

Problem Statements & Proposed Solutions	Y/N
Does the problem statement indicate the people who are affected?	
Does the problem statement identify the underlying cause of the problem?	
Does the problem statement propose how to address the problem?	
Strategies	**Y/N**
Are strategies described at the **district level** and at the school or classroom levels, as needed, to address the problems that were identified?	
Taken as a whole, are the strategies articulated in the logic model sufficiently **bold and ambitious**?	
Taken as a whole, are the strategies articulated in the logic model sufficiently **attainable**?	
Taken as a whole, can the strategies **withstand scrutiny**?	
Taken as a whole, do the strategies represent a **justifiable use of resources** in light of current strategies and initiatives in the district?	
Are existing strategies described in ways that indicate how they will achieve different results than in the past?	
Do the descriptions of the strategies communicate to internal and external stakeholders how the strategy will address the issues identified?	
Resources	**Y/N**
Do the resources identify the full range of supports needed by the district or its schools to implement the strategies?	

Measures of Implementation (Outputs)	Y/N
Are outputs described in terms of adult actions and behavior?	
Do outputs document technical steps for which the actions are clear and the results easily quantified?	
Are outputs specific in terms of what will take place, with/for whom, to what extent, and by when?	
Measures of Change (Outcomes)	**Y/N**
Do outcomes describe the intermediate (formative) and longer-term (summative) results the district expects to achieve?	
Do outcomes provide evidence of shifts in the skills, knowledge, and behavior of the adults and students targeted by the strategies?	
Do outcomes adequately describe how teachers, principals, and/or district personnel will approach their work differently as a result of the strategies?	
Are outcomes specific in terms of what will change, for whom, by how much, and by when?	
Goals (Desired Impact)	**Y/N**
Does the goal statement describe the sustained effects or consequences the district expects to see over a multi-year period?	
Does the goal describe how the systems, processes, practices, and structures described elsewhere in the logic model will transform the culture of the district and what it believes to be true about good teaching and learning?	
(Overall)	**Y/N**
Does the model articulate to internal and external stakeholders, in plain language, the connection between strategies, outcomes, and the desired impact of goals at the district, school, or classroom levels?	
Does the model give an idea as to the roles and responsibilities of internal stakeholders, i.e., the district leadership team, central office staff, principals, and teachers, in implementing the strategies?	
Does the model serve as convincing evidence to external stakeholders, i.e., the school committee, parents and families, state education agencies, and the public, that the proposed changes are compelling, will result in rapid improvement, and will use resources effectively?	
Does the model give a credible chain of events, from strategies through outcomes?	
Taken as a whole, are the strategies articulated by the model likely to lead to improved results for students, long-term gains in school and school system capacity, and increased productivity and effectiveness in the targeted areas?	
Does the model outline both implementation measures (outputs) and measures of change (outcomes)?	
Does the model reflect input from the superintendent so it aligns with the district's strategic goals for systemic improvement?	

CRAFTING MEANINGFUL MEASURES CHECKLIST 5.2.1T

Purpose	To guide the creation of useful measures of implementation (outputs) and measures of change (outcomes).	**Related Documents** 5–Action Module 5.2.2R: Elements of a Well-Written Measure
Description	This checklist can guide a District Data Team in crafting and refining measures that can be useful in monitoring the implementation of a logic model, action plan, or evaluation plan, and determining progress toward desired goals.	
Time	30–90 minutes	

Note:

- This activity may be conducted with the District Data Team, or with other stakeholders involved in the improvement effort being discussed.

- This activity is most useful if the Team has drafted a logic model, action plan, or evaluation plan prior to beginning.

- Measures are also known as indicators or benchmarks, and can be short-term (formative) or long-term (summative).

Directions:

- Use this checklist to reflect on and refine the measures you have crafted to demonstrate implementation and change.

- First respond to the questions separately for each individual measure you have crafted, then reflect on all the measures collectively in relation to the identified strategy (or strategies) or action steps.

Examples:

Unrefined measure: Increase the percentage of students who pass the MCAS tests on the first attempt.

Refined measure: To increase the percentage of students who pass the MCAS ELA test on the first attempt by 4 percentage points each year from 2010 to 2014.

District/School Name: _____ **Date:** _____

Foundational Questions	Y/N	Y/N	Y/N
1. Does the measure respond to the questions:			
• *What will change?*			
• *For whom?*			
• *By how much? (or how many or what percent—be specific)*			
• *By when?*			
2. Does the measure articulate what evidence is needed to demonstrate progress? The specific criteria against which the measure will be evaluated?			
3. Does the measure paint a clear picture of what, precisely, it will look like to achieve full implementation or the full degree of change desired?			
4. Is there consensus among stakeholders that this is a worthy outcome?			
5. Is there consensus among stakeholders that this measure is needed to evaluate the success of the strategy or action step?			
Refining Questions	Y/N	Y/N	Y/N
6. Is this measure sufficiently bold, yet still achievable given available resources, knowledge, and time?			
7. Does the measure suggest or explain the connection between the data and the strategy or action(s) that contribute to success in the targeted areas?			
8. Are the data generated by the measure adequate to evaluate the effectiveness of the strategy or action step(s) they relate to?			
9. Is the description of the measure specific and measurable enough to allow for clear communication with stakeholders, as well as for monitoring and evaluation?			
10. Is the timeline realistic given current capacity?			
11. Has the Team identified a means to embed collection and analysis of the measure into the action plan?			
Looking at the Measures Collectively	Y/N	Y/N	Y/N
12. Will the measures demonstrate the success of a given strategy or action step(s)?			
13. Does the achievement of all the benchmarks for a given action step show that the strategy was successfully implemented? If not, what other benchmarks need to be included?			
14. Do the measures indicate substantial and clear progress toward the desired goal at intervals when monitoring and evaluation will occur? e.g., short and long-term measures to demonstrate results are evident at 3 months, 6 months, etc.			
15. Is there a sufficient balance of quantitative and qualitative indicators to measure results?			
16. Is there a balance of data from a variety of domains (demographics, perceptions, and school or district processes, as well as student outcomes)?			
17. Is there a sufficient range of measures to promote self-monitoring and measurement of success for each strategy?			

ELEMENTS OF A WELL-WRITTEN MEASURE   5.2.2R

Purpose	To learn how to articulate clear measures of implementation (output) and change (outcomes).	
Description	This activity provides an example of how a typical measure is refined to be more specific and useful. This can serve as a guide for districts as they craft measures of implementation and change related to their strategies and goals.	
Time	30 minutes.	

Related Documents
5–Action Module
5.2.1T: Crafting Meaningful
            Measures Checklist

Directions:

1. Open and study the text below: *Elements of a Well-Written Measure*.

2. Using this document as a guide, each Data Team member should create a well-written measure from each of the following scenarios by:

    ♦   Identifying each of the four elements of a well-written measure

    ♦   Writing a clear statement

3. As a Data Team, reach consensus on the most appropriate measure for each scenario. Possible ̵answers" are included at the end of this document, which you may want to consult AFTER your discussion!

Elements of a Well-Written Measure

Typical Goal or Desired Impact

▶ Increase the achievement of all students.

Typical Measure

▶ *Increase the percentage of students who pass the MCAS tests on the first attempt.*

A clearer and more useful measure would address the following questions:

1. What will change?

- The percentage of students who pass the MCAS ELA test.

2. For what population?

- Students who are taking the MCAS for the first time.

3. By how much?

- What percentage passed in 2005–06? (57% in ELA; 58% in mathematics)
- What percentage passed in 2006–07? (73% in ELA; 57% in mathematics)
- What percentage must pass to meet NCLB requirements? (100%)
- When do the NCLB requirements need to be met? (2014)
- What incremental increase must be sustained to meet the NCLB requirements? (ELA: 100% (in 2014) – 73% (in 2006–07) = 27 percentage points difference; 2014–2008 = 7 tests remaining to show progress; 27/7 = 3.9 percentage points/year needed to reach target if linear improvement is assumed.

4. By when?

- Annual improvement target?
- By 2014?
- After a certain number of years to allow the impact of an intervention to be felt?

The resulting measure (compare to the typical measure above):

▶ *To increase the percentage of students who pass the MCAS ELA test on the first attempt by 4 percentage points each year from 2010 to 2014.*

Scenarios

Scenario 1: The Scenic Cove School District needs to determine if the new grade 3–6 English curriculum purchased in 2009 and used with the English language learners with special needs is effective in reducing the performance gap between special education and general education ELL students as measured by the MCAS English test from 10 percentage points to 0 by the 2012 test.

> **Elements:**
>
> - ♦ What will change?
> - ♦ For whom?
> - ♦ By how much?
> - ♦ By when?
>
> **Statement:**

Scenario 2: In response to chronically low mathematics performance across the district, the superintendent reallocated resources from the professional development budget to the salary account to enable hiring mathematics coaches to provide embedded professional development for the middle school mathematics teachers in one of the two district middle schools. The superintendent hoped to see a significant increase in the percent of proficient students (at least a 10 percentage point increase) in the middle school students whose teachers had participated in the embedded professional development provided by mathematics coaches within three years.

> **Elements:**
>
> - ♦ What will change?
> - ♦ For whom?
> - ♦ By how much?
> - ♦ By when?
>
> **Statement:**

Scenario 3: The superintendent of the Scenic Cove School District reviewed cohort graduation data (same students grade 9 to grade 12) for the class of 2009 and was shocked to see that only 80% of the cohort graduated on time, while the state average was 95%. The superintendent instructed the assistant superintendent to work with the District Data Team to develop a measurable improvement target for the class of 2012, in order to bring the district in line with the current state graduation rate.

> **Elements:**
>
> - ♦ What will change?
> - ♦ For whom?
> - ♦ By how much?
> - ♦ By when?
>
> **Statement:**

Scenario 4: The district leadership team, with support from the District Data Team, reviewed MCAS performance in ELA at each grade level over the past three years. The data revealed that the percentage of proficient female students was consistently five percentage points or more higher than the percentage of proficient male students at each grade level. The District Data Team was asked to create a measurable improvement target for male students to eliminate this gap in performance by the 2012 test administration date.

> **Elements:**
> - ♦ What will change?
> - ♦ For whom?
> - ♦ By how much?
> - ♦ By when?
>
> **Statement:**

Scenario 5: During the district principals' meeting, the principals of the four district high schools noted that the data displays the District Data Team provided clearly showed a positive relationship between high absence and low performance on the grade 10 MCAS ELA test. On the 2009 MCAS Mathematics test, 30% of the grade 10 students had been absent for 10 or more days prior to test administration. Of these, 90% scored at the failing level. The principals worked together, with support from the District Data Team, to craft an improvement goal for attendance in their schools that would have no student with 10 or more absences prior to the 2011 MCAS test administration date.

> **Elements:**
> - ♦ What will change?
> - ♦ For whom?
> - ♦ By how much?
> - ♦ By when?
>
> **Statement:**

Scenario 6: While investigating the cohort graduation rate, the assistant superintendent noticed that students who were retained in grade 9 generally didn't graduate with their class. Five percent of the students in the class of 2009 cohort had been retained in grade 9 and only 10% of these students graduated with their class. To develop an action plan to address this problem, the assistant superintendent must craft a measurable improvement target for grade 9 retention for the class of 2013.

> **Elements:**
> - ♦ What will change?
> - ♦ For whom?
> - ♦ By how much?
> - ♦ By when?
>
> **Statement:**

Possible Answers to Scenarios

Scenario 1
Elements:
- What will change? Gap between special education and general education
- For whom? English language learners with special needs
- By how much? 10 percentage points
- By when? 2012

Statement: To decrease the gap between special education and general education ELL student performance on the MCAS English test from 10 percentage points on the 2009 tests to 0 on the 2012 test.

Scenario 2
Elements:
- What will change? Percent of students proficient in MCAS Mathematics
- For whom? Middle school students
- By how much? 10 percentage points
- By when? Within three years

Statement: To increase within three years the percentage of middle school mathematics students in the target school who score at the proficient level or above on the MCAS mathematics test.

Scenario 3:
Elements:
- What will change? Graduation rate
- For whom? Class of 2012
- By how much? From 80% to 95%
- By when? 2012

Statement: To increase the cohort graduation rate from 80% to 95% for the class of 2012.

Scenario 4:
Elements:
- What will change? The gap between proficient male and female students
- For whom? Male students at all grade levels
- By how much? To equal the percentage of proficient female students
- By when? 2012 MCAS test administration date

Statement: To increase the percentage of proficient male students at each grade level to equal the percentage of proficient female students by the 2012 MCAS test administration date.

Scenario 5:
Elements:
- What will change? The percentage of students with 10 or more days of absence
- For whom? Grade 10 students
- By how much? No student with 10 or more absences
- By when? 2011 MCAS test administration date

Statement: To decrease to 0 the percentage of grade 10 students with 10 or more days of absence prior to the 2011 MCAS test administration date.

Scenario 6:
Elements:
- What will change? Grade 9 retention rate
- For whom? Class of 2013
- By how much? By 5 percentage points
- By when? 2013

Statement: To decrease the grade 9 retention rate for the Class of 2013 by 5 percentage points.

ACTION PLAN TEMPLATE   5.3.1T

Purpose	To document the series of steps needed to ensure that the strategies identified by the District Data Team to address the identified problem areas are implemented as intended.
Description	Develop an action plan (if needed) to implement new strategies or to implement existing strategies more effectively.
Time	30–45 minutes for each strategy requiring an action plan.

Related Documents
5–Action Module
5.3.2T: Action Plan Checklist

Note: As discussed in the text of *Module 5: Action*, it is not always necessary to develop an action plan. In considering whether or not to craft an action plan, a district might ask:

▶ Do action plans already exist for the strategies we have identified?
▶ Would an action plan significantly enhance the district's ability to delegate steps and/or monitor their completion?

Generally speaking, action plans are only required for new strategies or strategies that require changes to function as intended.

Components of an Action Plan

In relationship to the logic model, an action plan has the following components:

INPUTS			OUTPUTS	OUTCOMES	IMPACT
Problem Statement(s)	Strategies	Resources	Measures of Implementation	Measures of Change	Goals

Strategy:				
Action Steps	Resources	Measures of Implementation	Owner	Deadline

Essentially, action plans drill down to provide more detail linking the strategies and resources to the measures of implementation and ultimate goals. If the Team has already developed a logic model to articulate the district's theory of action in supporting improvement, then the strategies, resources, and many of the implementation measures will have already been identified. If it does not have a logic model, then the steps below can help the Team create a plan.

Building an Action Plan

Begin by asking:

- If the district intends to leverage an *existing strategy* to address the problems it identified, does the strategy need to be refined, adjusted, or improved prior to its implementation?

- If the district identified a *new strategy* to address the problems it identified, does the new strategy require multiple steps to be implemented?

If the response to either of the above questions is "NO", then the strategy does not require an action plan. The District Data Team should focus its time and energy on developing action plans for the other strategies it identified, or proceed to *Module 6: Results* to develop an evaluation plan.

If the response to either of the above questions is "YES", use the template below to craft a plan that will guide implementation of the activities:

- Begin by articulating the overarching strategy that the action plan will support.

- Respond to the guiding questions in each column, proceeding from left to right. For example, begin in the first column by naming the specific action steps. For each action step, indicate the necessary and available resources, the measures of implementation (which can be drawn from the logic model, if it exists), the owner, and the deadline.

- Each action step should have corresponding information in each of the other columns. For every action step, there should be resources, at least one measure of implementation, an owner, and a deadline for completion.

Note:

- If the Team has crafted a logic model (*5.1.1T* and *5.1.2T*), it should have that available for reference, as the strategies, resources, and many of the implementation measures will have already been identified.

- *5.3.2T: Action Plan Checklist* provides additional guidance on refining the completed plan.

Directions for Completing an Action Plan

1. Indicate the **strategy**—the specific means, method, or approach to solving the identified problem(s). If the Team has completed a logic model, these are outlined in the second column. If the Team has not completed a logic model, it will need to determine the best approach to addressing the identified problem. Since the strategy is the driver of the action plan, it is essential that the Team think carefully about this component.

2. List the **action steps** that describe the major steps that must be taken to implement the strategy. They should be listed in order of completion, note which need to be completed before others, and which need to be sufficiently described so others can understand them and carry them out.

   In articulating action steps, a district should stay focused on the big picture, naming only the most significant, far-reaching steps that need to be monitored as evidence of progress toward the goal. However, the owner of a specific action step may wish to add detail to the action plan to guide his or her particular work, e.g., if he or she has to manage a team of people to get the work done, or has many details to track.

3. Indicate the **resources** needed to implement one or more action steps, if needed. In some cases, key resources may be lacking or not yet allocated to the project, in which case one activity would be to secure those resources. For example, ESE offers a wide range of technical assistance, but accessing that assistance for a particular project would require someone from the district approaching the appropriate office to see what is available. As with the strategy, if the Team has completed a logic model, it will have already identified this information.

4. Indicate the **measures of implementation** that tell when the action step or strategy is fully realized or carried out. For example, the measure of implementation of a professional development strategy might be that a certain percentage of teachers receive training over a specified period. Again, if the Team has completed a logic model, it will have already determined what will serve as evidence that key action steps have been implemented, and can use those measures as a starting point. However, since the action plan by definition provides more detail, the Team may want to add additional measures of implementation that capture a finer grain of detail.

5. Indicate the **owner**—the individual most closely responsible and accountable for a given action step. It is essential that this be a specific person and that they have the resources, capacity, authority, and support required for completing the step.

6. Give the **deadline** by when the action step will be completed. Completion of the last step signifies the date by which the strategy is expected to be fully operational and by which measures will be available for analysis.

District/School Name: _____ **Today's Date:** _____

Strategy:				
Action Steps	**Resources**	**Measures of Implementation (Outputs)**	**Owner**	**Deadline**
What steps must be taken to implement our strategy?	*What specific supports are needed to implement this action step?*	*How will readers of the plan know the action step or strategy is fully realized or carried out?*	*Who is most closely responsible and accountable for taking each action step?*	*By when will the step be completed?*

		Related Documents
Purpose	To craft an action plan to support the implementation of strategies identified in the previous module, *Knowledge*.	5–Action Module 5.3.1T: Action Plan Template
Description	This checklist can guide a District Data Team in designing or refining an action plan to guide implementation of a strategy.	
Time	1–2 hours, depending on the number of action plans to be developed.	

Directions:

Before creating the action plan, ask:

- If the district intends to leverage an *existing strategy* to address the problems it identified, does the strategy need to be refined, adjusted, or improved prior to its implementation?
- If the district identified a *new strategy* to address the problems it identified, does the new strategy require multiple steps to be implemented?

If the response to either of the above questions is "NO," then the strategy does not require an action plan. The District Data Team should focus its time and energy on developing action plans for the other strategies it identified, or proceed to *Module 6: Results* to develop an evaluation plan.

If the response to either of the above questions is "YES," use the template below to craft a plan that will guide implementation of the activities.

Note: If the Team has crafted a logic model (*5.1.1T* and *5.1.2T*), it should have that available for reference, as strategies, resources, and many of the implementation measures will have already been identified.

Strategy	Y/N
If this is an existing strategy, is it described in a way that indicates how it will achieve different results than in the past?	
Does the description of the strategy communicate to internal and external stakeholders how it will address the issues identified?	
Action Steps/Activities	**Y/N**
Are just the key, far-reaching action steps that need to be monitored as evidence of progress toward the goal identified?	
Are action steps listed in order of completion?	
Is it implicit which action steps need to be completed before others?	
Are action steps sufficiently described so that others can understand them and carry them out?	
Resources	**Y/N**
If necessary, are any special supports (technology, materials, funding, infrastructure, people, polices, political support, etc.) required to implement the strategy indicated?	
Measures of Implementation (Outputs)	**Y/N**
Are outputs described in terms of adult actions and behavior?	
Do outputs document technical steps for which the actions are clear and the results easily quantified?	
Are outputs specific in terms of what will take place, with/for whom, to what extent, and by when?	
Owner	**Y/N**
Is each action step ascribed to an individual person (not a group, title, or team)?	
Does each person assigned an action step have the resources, capacity, authority, and support needed to complete the step?	
Deadline	**Y/N**
Does the deadline indicate by when the step will be completed?	

District Data Team Toolkit

Massachusetts Department of
ELEMENTARY & SECONDARY
EDUCATION

MODULE 6: RESULTS

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Tools and Resources for Results

6.1.1T: Evaluation Plan Template	6.2.2T: Building Data Walls
6.2.1T: Communication Organizer	6.2.3T: Evaluation Report Template

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INTRODUCTION

WHERE ARE WE NOW?

The District Data Team Toolkit is based on the Data-Driven Inquiry and Action Cycle. The Cycle provides the structure that takes data use within the district from asking the right questions to getting results. It is an iterative process in which the district acts on data to support continuous improvement. The Toolkit uses the steps of the Cycle to structure a progression through the model—you are now in *Module 6: Results*.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Getting Ready	Inquiry	Information	Knowledge	Action	Results

Once a District Data Team, or any other district team, has begun implementing a logic model or improvement plan, it will want to monitor its progress toward the desired goal. The *Results* module can help a Team build capacity to evaluate the desired outcomes, monitor its progress on a given strategy (or strategies), and communicate those results to various stakeholders.

MODULE OBJECTIVES

The **Results** module will help a District Data Team:

▶ Decide what to evaluate

▶ Develop an evaluation plan

▶ Analyze evaluation data

▶ Identify and develop a communication strategy

▶ Continue the process of inquiry

PLANNING FOR EVALUATION

WHY DEVELOP AN EVALUATION PLAN?

Taking action means nothing if the District Data Team does not take time to reflect on the impact of the work. From the outset, a district should have a plan to analyze and evaluate the evidence generated by implementation of the designated strategies.

The evaluation plan helps the Team answer the questions:

- To what extent have new skills, knowledge, and expertise been acquired by the targeted adults and/or students?

- To what extent are these new skills, knowledge, and expertise being put to use effectively by the targeted adults and/or students?

- To what extent have the adults and/or students shifted their habits or beliefs in a way that impacts learning?

Since *what gets measured gets done*, it is wise not to wait until the end of implementation to draft an evaluation plan. Instead, the Team should begin thinking very early in the implementation process—if not before implementation even begins—about the most important evidence to measure.

These measures of implementation and change will be used to indicate if the strategy has had the desired impact, and therefore they should be articulated clearly and meaningfully. *Module 5: Action* provides guidance on crafting useful measures. In short, the measures should be bold yet achievable, and help a Team answer the questions:

- What did the district attempt to change and why?

- What did the district do to try to make the change?

- What results were achieved?

- What effect(s) did the action steps have on the habits, beliefs, and ways of working of those involved?

- What will happen next?

An evaluation plan can guide the overall evaluation process, where the Team reflects on, and reports publicly, the extent to which new skills, knowledge, and expertise have been acquired by the targeted adults and/or students, and the extent to which they are having an impact on student achievement and organizational culture.

It outlines the specific measures that will be monitored, the evidence to be collected, and the date(s) for analysis, and can be a useful tool for keeping a team organized and focused on the desired change the district is trying to bring about.

DECIDING WHAT TO EVALUATE

In crafting its measures of implementation and change, the District Data Team is essentially deciding what will be evaluated. As discussed in *Module 5: Action*, since the measures that are articulated will be used to monitor progress, it is important to articulate only those measures whose evidence will be collected and analyzed. The Team should not identify a measure if the evidence it would generate does not relate directly to an evaluation question.

In deciding what to evaluate, the Team might consider these questions:

▶ **What are the questions internal and external stakeholders want to have answered?**

- What questions are stakeholders (including the Team itself) asking about the work of the district? What improvements are they seeking?

- What responses will stakeholders want in relation to the original focusing questions and data that drove the inquiry process?

▶ **How will the information be used, and by whom?** Consider the ways the data might be used both internally and externally.

- Will the data be used to inform organizational learning and continued improvement of practice?

- Will the data be used for compliance with external entities?

- A combination of these?

By considering these questions, the Team can narrow the focus and scope of its evaluation to those measures that best document and communicate progress toward outcomes and impact.

> **I**f the District Data Team has crafted a logic model, then much of its work in deciding what to evaluate is already done, as the logic model articulates the essential *outcomes*, or measures of change.

If the Team is unsure how the data will be used or by whom, they may not be worth collecting. If the Team has identified a substantial amount of data to collect, it should seek guidance from district leadership in setting priorities appropriately. For example, while it is wise to consider responding to the questions stakeholders ask, the Team might not want to get distracted by answering all of their questions, but rather focus on those that will most further the district's vision, mission, and strategic plan.

If the District Data Team has crafted a logic model (*5.1.1T and 5.1.2T*), then much of its work in deciding what to evaluate is already done, as the logic model articulates the essential *outcomes*, or measures of change, in adult and student practice that the district will look for as it implements its strategy or strategies.

If the Team does not have a logic model to work from, it will need to think strategically about what to evaluate, when, and why. The Team should consult with district and school leadership in order to select the areas that will provide the most useful information for the Team, district leadership, and other stakeholders.

MONITORING PROGRESS

As soon as the first action step is underway, the Team (or some other entity) can begin monitoring the progress of the district's work. It will likely monitor the implementation of the actions related to the district's strategies. Likewise, the Team may also begin monitoring those strategies for efficacy and impact. However, the two forms of monitoring should not be confused:

- When we monitor *implementation*, we analyze measures that help answer the question, *did the work get done*?

- When we monitor *change*, we analyze measures that help answer the question, *is our work having the intended effects*?

Monitoring implementation (or outputs) helps the Team note the progress of the action steps adults are taking to implement the strategy. It helps answer the question, *what took place for whom, when, and to what extent?* If the Team has decided to use an action plan to implement one or more strategies, then it can use the dates in the "deadline" column to monitor implementation. The Team can note whether or not steps were fully implemented by the desired date and modify implementation as needed to meet the targets.

Monitoring change (or outcomes), by contrast, is when the district evaluates whether its initiatives are having the intended effects on student and adult performance. It helps the Team answer the question *what changed, for whom, by how much, and when?* Or, more succinctly, *we've taken action—so how did we do?*

This work of monitoring both implementation and change can begin once the strategies are in motion, and may in fact coincide with one another, making it all the more important to distinguish between the two.

Likewise, in the midst of the process, a district should be mindful not to equate output data (such as the percent of teachers trained) with outcome data (such as how this training has changed instructional practice and improved student performance).

The following chart summarizes key differences between the two processes.

Monitoring Implementation…	Monitoring Change…
Based on data generated by the *measures of implementation* in the logic model	Based on data generated by the *measures of change* in the logic model
Did the work get done?	*Is our work having the intended effects?*
What took place, for whom, to what extent and when?	*What changed, for whom, by how much, and when?*
Focused on the short term	Focused on the intermediate and long term
Internal stakeholders are the primary audience, e.g., the Team itself and those directly involved with the action plan	External stakeholders are the primary audience, e.g., other district personnel, as well as the wider community

BUILDING AN EVALUATION PLAN

While a logic model outlines a theory of action, and an action plan may provide more detail on the steps taken to implement the strategy, an evaluation plan guides the process of evaluating results. It organizes the information that will form the basis for the evaluation process and the discussions about whether or not the desired changes took place.

If the Team developed a logic model in *Module 5: Action*, then the relationship of the evaluation plan to the model is straightforward.

INPUTS			OUTPUTS	OUTCOMES	IMPACT
Problem Statement(s)	Strategies	Resources	Measures of Implementation	Measures of Change	Goals
		(Optional)	(Optional)	(Essential)	(Essential)

Goal:				
Measure	Data to be Collected	Source or Location	Date for Analysis	Person Responsible

1. To build an evaluation plan, first identify the **measures** which would demonstrate progress toward the goal. The most important measures to focus on are those related to the acquisition of skills and knowledge or shifts in habits and values by the adults and students involved in the initiative—in other words, the measures of change or outcomes. However, depending on the situation, it may also be useful to analyze evidence related to the measures of implementation, and potentially even the allocation of resources. (Note the essential and optional labels in the diagram above). This is discussed further in the next section, *Conducting the Evaluation.*

If the Team has completed a logic model, it will already have articulated these measures for both adults and students, for both the short- and long-term. For help on developing good measures of change, see the section on *Crafting Meaningful Measures* in *Module 5: Action*.

2. Specify the **data to be collected**—the actual evidence the district will collect to document these changes. If the Team has completed a data inventory (*1.5.1T*), it may be a useful reminder of the range of evidence the district currently collects.

3. Give the **source or location** where this evidence can be found when the Team is ready to analyze it. The data inventory can be useful for this section as well.

4. Specify the **date for analysis** by which the Team will engage thoughtfully with the information provided by each. If the measures are written well, these dates will already be implied.

5. Indicate the **person responsible** for ensuring that the evidence for a given measure will be available for analysis by the Team at the designated time.

Activity 6.1 provides a template for an evaluation plan. Again, if the Team has crafted a logic model, it already has the majority of elements needed. If the Team has not yet done this, the evaluation plan template will guide it to think about the necessary information.

Activity 6.1 Crafting an Evaluation Plan

This template can guide a district in articulating a plan for monitoring implementation and outcomes of its improvement efforts.

(6.1.1T: Evaluation Plan Template)

CONDUCTING AN EVALUATION

ANALYZING THE EVIDENCE

If the measures are specified concretely enough, then the monitoring dates will be implied.

Once the evaluation plan is in place, the team is ready to begin collecting and analyzing relevant data.[1] Because a strategic plan or logic model is based on a causal chain of events, each of which is dependent on the next, the focus areas may need to be examined chronologically: one cannot look for impact without outcomes; one cannot look for outcomes without outputs; one cannot look for outputs without inputs.

What is most important to evaluate are the outcomes and impact—the measureable changes in the ways adults and students approach their respective work related to teaching and learning, and the relationship of those changes to the district's vision for improvement. In many ways the evaluation process mirrors the process in *Module 3: Information*, reflecting the cyclical nature of the inquiry process.

As mentioned earlier, the District Data Team will want to begin evaluating the measures of change soon after the work to implement the strategy has begun, and at the same time it monitors the implementation of the steps themselves for early indicators of the impact of implementation.

For example, if the strategy involves training teachers in a specific technique, early monitoring of *implementation* might communicate the percent of teachers trained, while early monitoring of *change* might investigate the impact of the training on the practice of those teachers, and might note differences between the practice of teachers who have received the training and those who have not.

Naturally, the Team will want to evaluate the outcomes of a strategy once it has been fully implemented. If it has engaged in analyzing outcome data along the way, this final evaluation will not take as much additional effort as it would if a district has not been evaluating the early evidence of actual change in practice.

As mentioned earlier, the Team will want to begin by evaluating the measures of change it has identified, first for students, and then for the

> **W**hat is most important to evaluate are the outcomes and impact…the Team will want to evaluate the outcomes of a strategy once it has been fully implemented.

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[1] The *Data Analysis Protocol (3.1.1T)* in *Module 3* can help the Team shape its evaluation of outcome data.

adults. If this outcome data does not demonstrate any movement toward the desired goal, the Team should first consider:

- Is the best evidence possible being used to demonstrate the desired changes? What other evidence might be available to show whether the strategy is having the desired impact?

- Is more time or a greater degree of implementation needed before the action steps will begin to yield the desired changes?

If the Team feels it has identified the best measures and has allowed enough time for change to occur, and those changes are not evident, then it will need to review the elements put in place to achieve those results.

- Do modifications need to be made to the action steps in order to have greater impact?

- Are adequate and appropriate resources being used in service of this strategy and related action steps?

- Did the Team implement the best strategies possible for the given problem and its context?

- Did the Team diagnose the problem correctly in the first place?

It is important to consider these questions in order, and one at a time. If the Team gets the information it needs by considering the first question, it does not need to spend time on the remaining questions.

In essence these questions mirror the elements of the logic model outlined in *Module 5: Action*. They guide the Team to reflect on each component of the logic model, starting at the end and working backwards to the Team's definition of the problem itself.

INPUTS			OUTPUTS	OUTCOMES	IMPACT
Problem Statements	Strategies	Resources	Measures of Implementation	Measures of Change	Goals

For example, if a District Data Team has evaluated all aspects of its logic model and has deemed that, in fact, it did not identify the real problem, it may want to visit or revisit the guidance in earlier modules to see if it was asking the right questions in the first place. The *District Data Team Self-Assessment (0.1.1T)* can help a Team understand its strengths and weaknesses in regard to inquiry, action, and results, and can direct it to tools and resources in other modules in this Toolkit that could be useful at this point of the process.

COMMUNICATING RESULTS

Interim evaluation data should be communicated to stakeholders to demonstrate initial successes, as well as any early lessons learned and adjustments made. This is especially important given that the goal is to shift ways that adults and students in the district think about and approach their work. Indications of progress can serve as an incentive for the individuals involved to continue the work. The results of the evaluation plan can also contribute to the knowledge base in the district about what works, what did not work, and why, given a particular district, school, or classroom context.[2]

The results of any Team's efforts are important to a number of audiences for a variety of reasons. For example, if a district did an exceptional job of raising the percentage of English language learners scoring Proficient and Advanced on the MCAS by ten percent or more for several years, many people would need to know for many different reasons. To name a few:

- The data will justify to external stakeholders that the district's logic model was a sound approach to improving the performance of adults and students in the organization.

- The District Data Team and other internal stakeholders would want to identify the key actions and processes contributing to results in order to embed successful practices across the district, and to inform the formation of new initiatives and inquiries.

- The schools' faculty will build on this record of success to collaboratively approach new challenges.

Activity 6.2 Communicating Results

Use the *Communication Organizer* to think about the specific audiences that need to know about your results and the messages each audience needs to receive.

Use the report template for guidance on creating a written summary of the work, if appropriate for the context.

Use *Building Data Walls* to consolidate in one display a range of information that summarizes the district's focus on inquiry and data-driven action.

(6.2.1T: Communication Organizer)
(6.2.2T: Building Data Walls)
(6.2.3T: Evaluation Report Template)

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[2] *Module 1: Getting Ready* provides guidance for managing the change effort and addressing some of the concerns that stakeholders may raise during the process.
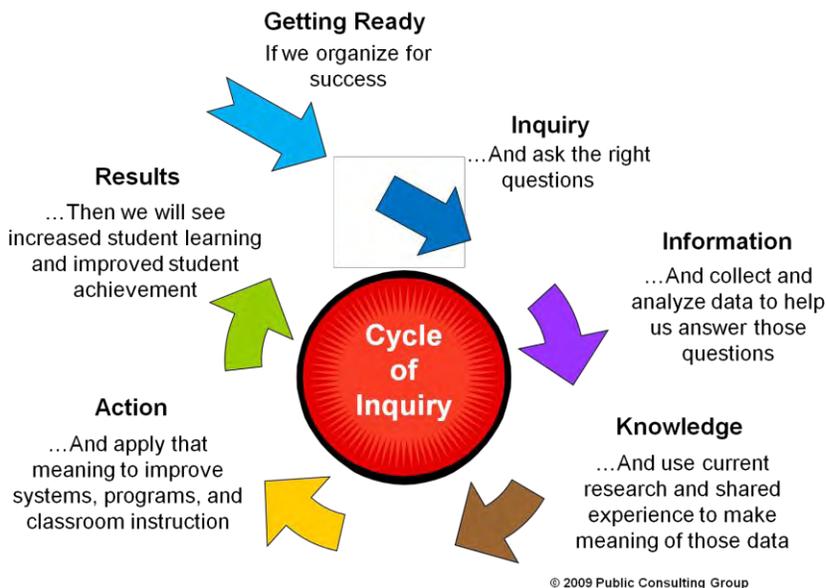
EVALUATION AS CONTINUOUS IMPROVEMENT

Engaging in inquiry is an ongoing process, and ultimately an embedded way of approaching one's work. Purposefully taking time to reflect on the steps taken and not taken and the intermediate and longer-term results will determine whether the identified strategies are transforming the culture of the district and improving student achievement. If at any time a district finds it is off target, it will want to reflect back on earlier steps in the process and adjust as necessary.

For example, if the District Data Team did not see the desired results, it may need to modify its evaluation plan. It may find that it does not have enough quality data, or that data are not presented in a way that highlights key trends or outliers. The Team may want to reflect on whether it identified the best action steps and resources for the strategy, of if the strategies and action steps it decided on in the first place were the most appropriate. Continuing to reflect back on the process, the Team may even find that the initial focusing question used to frame the inquiry process might not have been the best one, and it may want to re-engage in inquiry with a different question in mind.

By intentionally engaging in ongoing collaborative reflection, the Team can build its capacity to ask good questions, use data to plan effective action, and ultimately see greater results in the work of teaching and learning in the district.

Getting Ready
If we organize for success

Inquiry
…And ask the right questions

Results
…Then we will see increased student learning and improved student achievement

Information
…And collect and analyze data to help us answer those questions

Cycle of Inquiry

Action
…And apply that meaning to improve systems, programs, and classroom instruction

Knowledge
…And use current research and shared experience to make meaning of those data

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MODULE SUMMARY

Evaluation is an essential, yet often overlooked aspect of the improvement process. Rigorous and timely evaluation holds people accountable for results, builds the confidence of internal and external stakeholders in supporting the district's theory of improvement, and contributes to improved outcomes for students.

This module guides a District Data Team in the creation and implementation of an evaluation plan, simultaneously linking the Team with resources in all of the previous modules in the Toolkit. The module re-introduces the *District Data Team Self-Assessment* as a way to reflect on the Team's capacity for inquiry and data use, and a means to identify the best parts of the Toolkit with which to engage.

Regardless of the success of its strategy, logic model, or implementation plan, a District Data Team is likely to emerge from this stage in the process with new questions to investigate through a process of inquiry. These questions may be based on successes that the Team wishes to disseminate, or on failures to hit the mark that require further attention to resolve. Either way, they can lead the Team to deepen its investigation into its own practice and that of the stakeholders in the district, further embedding a culture of data-driven inquiry, action, and learning that is ultimately the business of education.

References

W.K. Kellogg Foundation (2004). *Logic Model Development Guide*. Battle Creek, MI: Author

For more information on this and other district support resources, or to share feedback on this tool, visit http://www.doe.mass.edu/sda/ucd/ or email districtassist@doe.mass.edu.

EVALUATION PLAN TEMPLATE   6.1.1T

Purpose	The evaluation plan provides structure and guidance for the Team as it considers the impact of a certain strategy (or strategies) on the identified problem.	**Related Documents** 6–Results Module
Description	The District Data Team completes the evaluation plan before implementation of a strategy begins, or very soon after, in order to articulate the data it will collect, when, and from where, in order to evaluate if the strategy and action steps are having the desired effect on student and adult outcomes.	
Time	1–2 hours to create. Ongoing time to gather and analyze data.	

Notes:

- If the Team has crafted a logic model (*5.1.1T* and *5.1.2T*), it should have that available for reference, as the strategy and related measures of change (outcomes) will have already been identified.

- If the Team has completed a data inventory (*1.5.1T*), it can reference that for information on available data, their location, and the ease with which the Team can access the data.

Directions:

1. Begin by articulating the goal or desired impact that the Team is trying to achieve.

2. Respond to the guiding questions in each column, proceeding from left to right.

   - Begin in the first column by naming the specific measures that will serve as indicators that the strategy is working. It is essential that this includes any *measures of change (outcomes)*, but in some cases this may also include measures of *implementation (outputs)* and even resources.

   - Then for each measure indicate the specific evidence that will be collected, its source or location, the date for analysis by the Team, and the person responsible.

   - Each measure of change should have corresponding information in each of the other columns.

3. Use the plan to ensure the Team has the right data at the right time and is prepared to analyze it for results.

See the text in *Module 6* for additional guidance on completing the evaluation plan.

See *Module 3: Information* for guidance on analyzing data.

Goal (Desired Impact):

Measure	Specific Evidence to be Collected	Source or Location	Date for Analysis by Team	Person Responsible

COMMUNICATION ORGANIZER

6.2.1T

Purpose	Communication planning.
Description	Team members identify the specific findings that they need to share from the evaluation, as well as the audiences with whom they need to communicate.
Time	30 minutes–1 hour.

Related Documents
6–Results Module
6.2.2T: Building Data Walls
6.2.3T: Evaluation Report
       Template

What needs to be communicated? *(Finding or Message)*	To whom? *(Audience)*	Why?		By When? *(Deadline)*	How? *(Communication Tools/Venues)*	By whom? *(Person Responsible)*
		(What do we want them to know?)	*(How do we hope they use this information?)*			
	☐ School Board ☐ District Leadership Team ☐ District Data Team ☐ School Improvement Team ☐ School Faculty ☐ Parents ☐ Students ☐ Other _____				☐ Annual report ☐ Quarterly report ☐ District newsletter ☐ Data wall displays ☐ Website ☐ Email to relevant audience ☐ Presentation ☐ Other _____	
	☐ School Board ☐ District Leadership Team ☐ District Data Team ☐ School Improvement Team ☐ School Faculty ☐ Parents ☐ Students ☐ Other _____				☐ Annual report ☐ Quarterly report ☐ District newsletter ☐ Data wall displays ☐ Website ☐ Email to relevant audience ☐ Presentation ☐ Other _____	

What needs to be communicated? *(Finding or Message)*	To whom? *(Audience)*	Why?		By When? *(Deadline)*	How? *(Communication Tools/Venues)*	By whom? *(Person Responsible)*
		(What do we want them to know?)	*(How do we hope they use this information?)*			
	☐ School Board ☐ District Leadership Team ☐ District Data Team ☐ School Improvement Team ☐ School Faculty ☐ Parents ☐ Students ☐ Other _____				☐ Annual report ☐ Quarterly report ☐ District newsletter ☐ Data wall displays ☐ Website ☐ Email to relevant audience ☐ Presentation ☐ Other _____	
	☐ School Board ☐ District Leadership Team ☐ District Data Team ☐ School Improvement Team ☐ School Faculty ☐ Parents ☐ Students ☐ Other _____				☐ Annual report ☐ Quarterly report ☐ District newsletter ☐ Data wall displays ☐ Website ☐ Email to relevant audience ☐ Presentation ☐ Other _____	
	☐ School Board ☐ District Leadership Team ☐ District Data Team ☐ School Improvement Team ☐ School Faculty ☐ Parents ☐ Students ☐ Other _____				☐ Annual report ☐ Quarterly report ☐ District newsletter ☐ Data wall displays ☐ Website ☐ Email to relevant audience ☐ Presentation ☐ Other _____	

BUILDING DATA WALLS   6.2.2T

Purpose	To guide the creation of meaningful data walls.
Description	These resources guide a Team through the creation of two types of data walls.
Time	About 45 minutes.

Related Documents
6–Results Module
6.2.1T: Communication
      Organizer
6.2.3T: Evaluation Report
      Template

Overview

One effective strategy for communicating results is the use of data walls. A data wall is a visual representation of data related to a specific question or problem. It is comprised primarily of numbers, charts, and diagrams, using only enough text to annotate the data and articulate the inferences and conclusions that the Team has agreed on. A data wall may also capture any questions that have emerged as a result of the inquiry process. Ultimately, a data wall should be dynamic, interactive, and evolve over time as new data are added and new conclusions drawn.

An interactive data wall contains data that will be updated and manipulated often over a period of time, making the data wall a ―living" display. For example, a district might create a wall to track the percent of students across the district that are meeting district-wide or statewide standards. As new assessment data comes out, the Team could engage stakeholders in updating the wall and noticing shifts in outcomes. Such a data wall might be used with stakeholders most closely involved with implementing an action plan and monitoring its progress.

Consolidating in one display a range of information that summarizes the district‗s focus for inquiry and data-driven action can serve several purposes, including:

- Providing a visual reminder of the district‗s strategies and the corresponding implementation, which could lead to continued motivation to stay focused on the challenge

- Visually demonstrating how different, and potentially seemingly disparate, data sources informed the district‗s understanding of the problem

- Disseminating a common message to different stakeholders

- Engaging stakeholders in conversations about district priorities and goals for long-term impact

- Demonstrating how engaging with data can be an integral part of continually improving a district‗s work, and not merely a compliance exercise done for the benefit of others

Data walls can be portable (such as on a tri-fold science fair display board or rolling bulletin board) or may be a permanent installation on a wall. It is increasingly common to find data walls in the lobbies and offices of schools, often displaying data related to student assessment scores. The District Data Team might consider the value of displaying data walls in central office spaces as well, including areas devoted to functions such as finance, operations, and human resources. The Team may also consider having the same display in all buildings district-wide.

Guidelines for Creating and Using an Interactive Data Wall

An interactive data wall contains data that will be updated and manipulated often over a period of time, making the data wall a ―living" display. For example, a district might create a data wall to track the percent of students across the district who are meeting district-wide or statewide standards in the area of literacy. This may be related to strategies and interventions that the district has implemented to reach a district goal of students meeting literacy benchmarks by a certain time or grade level.

1. Find a data set that is closely related to the focus of inquiry. Display the data in a space where they will be easily accessible and easily viewed. After initial data is posted, and once action is taken and similar data are later collected, the data on the interactive data wall can be manipulated. A district's effort around progress monitoring students at the end of each marking period in third grade relative to reading achievement is one example of a dynamic data set that could be updated frequently. The periodic monitoring of student achievement would inform the district as to whether or not literacy strategies employed were resulting in an increase in student reading ability and if the district were meeting its goal related to the number of students proficient in that grade.

2. Identify the individual unit that will be monitored. In schools, this is the student. However, a district-wide data wall might use the classroom, grade level, or school as the unit to monitor. Use small magnets, post-its, or another material to create a marker for each unit, e.g., each classroom, grade level, or school.

   a. It may be best to label each unit in a way that maintains privacy, while also allowing the identification of specific units, e.g., specific classrooms.

   b. The Team might consider using additional coding of the markers to add a third or fourth dimension of data. For example, green markers could represent classrooms with teachers in their 1st or 2nd year, yellow could represent those in their 3rd–6th year, and orange could represent those with 7 or more years of experience.

3. Create a grid (data wall) with a data set on each axis and sort all underlined units' accordingly, for example:

Any School District Grade Three Reading Proficiency by Classroom* Second Marking Period				
	0–25%	**26–50%**	**51–75%**	**76–100%**
School A			○ ○	○ ○
School B	○	○ ○		
School C	○	○	○	○
School D			○ ○ ○ ○	

Depending on district size, the unit of analysis may be by classroom or by grade level.

In this grid, an audience can view sets of classroom level data across a district in relation to how many students were scoring at benchmark in each class. Subsequent administrations of a district-wide literacy assessment could then be administered and classrooms redistributed in relation to the number of students achieving benchmark. The movements of data points on the data wall provide stakeholders an opportunity to connect with data and see a picture of both aggregate and disaggregate results due to the nature of the display.

4. As data are updated, the Team can track movement of individual units from one administration to the next.

Note:
   a. Prior to manipulating or updating data, document the existing data wall in some form, such as with a picture, so the Team can reflect back on changes over time.
   b. Ideally, when engaging with the data, those closest to the data should be the ones to manipulate and update the data wall.

EVALUATION REPORT TEMPLATE   6.2.3T

Purpose	To report on the results of action taken by the District Data Team.	**Related Documents** 6–Results Module 6.2.1T: Communication Organizer 6.2.2T: Building Data Walls	
Description	The District Data Team can use this outline to report on its evaluation of the impact of the strategies in furthering the district's goals.		
Time	4–6 hours		

This is an outline of the major components of an evaluation report. The associated activities or resources in the Toolkit are indicated in parentheses. If the Team has completed any of the activities listed, it will want to have those available for reference as much of the information in the report derives directly from them.

I. Overview: A summary that describes the problem being addressed by the action plan.

    A. Original focusing question (and potentially also the related clarifying questions) *(See 2.1.1T)*

    B. Summary of initial findings from the original data displays and data overview *(See 2.5.1T and 2.5.2T)*

    C. Description of the suspected cause of the problem *(See 4.1.1T)*

    D. Goal or desired impact *(See 4.1.1T and 5.1.1T)*

II. Implementation Description: What the district did to address the problem.

    A. Brief narrative (1–2 paragraphs) identifying the strategy and major steps taken to address the problem *(See 4.1.1T, 5.1.1T, and 5.3.1T)*

    B. Description of key resources that contributed to the effort. *(See 5.1.1T and 5.3.1T)*

III. Evaluation Results: What the effect was of implementing the strategy.

    A. Data displays depicting the measures of implementation (outputs) and the measures of change (outcomes), highlighting the acquisition of skills, knowledge, and expertise, as well as shifts in habits and beliefs related to teaching and learning. *(See 2.4.1T through 2.4.4R)*

    B. Short narratives to describe findings from analysis of this data *(See 3.3.1T)*

IV. Recommendations and Next Steps: How the district will apply what it learned.

    A. Identification of new focusing questions *(See 2.1.1T and 3.3.1T)*

    B. Identification of immediate next steps to re-enter the Data-Driven Inquiry and Action Cycle

Section I: Overview

Original Focusing Question	
Summary of Initial Findings	
Suspected Cause of the Problem	
Goal (or Desired Impact)	

Section II: Implementation Description

Description of Strategies and Major Actions Taken	
Description of Key Resources	

Section III: Results

Use this section to summarize your results with data displays and written descriptions of your findings. Attach pages as necessary.

Section IV: Recommendations and Next Steps

New Focusing Questions	
Next Steps	Such as: *New team formulation, creation of new data displays and data overviews, ~~audiences~~ for communication…*