# **Math Acceleration Academy Guidebook**

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# Disclosure Statement

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# **Overview of Acceleration Academy Model**

An Acceleration Academy is a week-long academic program designed to accelerate student learning through engaging, standards-aligned lessons that meet the specific academic needs of students participating in the program. Each Acceleration Academy focuses on a specific content area and students who attend an Academy receive the equivalent of approximately one extra month of learning in one week. Acceleration Academy classes can either provide students with targeted supports to master grade-level standards or provide accelerated learning opportunities for advanced learners.

Acceleration Academy teachers should be selected through a rigorous application process to ensure all classes are taught by highly effective teachers. Teachers should be selected based on their ability to positively impact student learning and achievement through thoughtful planning, relationship-building, and creative, efficient instruction. The combination of more, highly-focused, instructional time led by exceptional teachers has resulted in positive student outcomes in several districts that have implemented the Acceleration Academy model with fidelity.

**In-Depth Case Study of Acceleration Academies**

* <http://goldenticketlawrence.newprofit.org/> - An in-depth case study of the Acceleration Academy program in Lawrence, MA, commissioned by [New Profit](https://www.newprofit.org/). The online case study includes videos of interviews with students, parents, teachers, and administrators.

**Research on Acceleration Academies**

* A study focused more generally on the turnaround efforts in Lawrence, MA, [*Can States Take Over and Turn Around School Districts? Evidence From Lawrence, Massachusetts*](https://scholar.harvard.edu/files/schueler/files/schuelergoodmandeming_lps_eepa_2017.pdf), specifically highlighted the Acceleration Academies as a strategy that had a significant impact on student achievement, as measured by MCAS
* A study of the program in Springfield, MA, [*Making the Most of School Vacation*](https://www.mitpressjournals.org/doi/abs/10.1162/edfp_a_00269), also showed positive effects on student outcomes

**Key Components of Acceleration Academy Model**

* Instruction is provided in-person
* Lessons are tailored to the specific needs of students and should involve engaging, hands-on learning experiences
* Multiple forms of student data (MCAS, benchmark assessments, attendance, etc.) are used to determine which students are invited to participate in an Academy
* Students receive 4+ hours of in-person instruction in the same content area each day for a total of 20+ hours of core content instruction during the Academy week
* Students in elementary and middle school grades attend at least 1 specials or enrichment class each day (highly recommended best practice but not required)
* Class sizes are small (10-12 students per content teacher)
* Students are taught by the same content teacher for the duration of the Academy week
* Classes are taught by highly effective teachers who are hired through a selective application process (See “Teacher Recruitment and Selection” for guidance/recommendations)
* Teachers are given the autonomy to create lessons based on their students' specific needs and/or focus standards set by the district or school (See the “Instructional Guidance” section of this document for guidance/recommendations)

# **Instructional Guidance**

DESE has developed **instructional guidance** for Math Acceleration Academies to help districts and teachers plan for the Academies. Districts should consider using this guidance to help develop an instructional planfor the Math Acceleration Academy week(s). Districts/schools should also consider sharing parts of this guidance (for instance, the “Guidelines for Instruction”) with teachers selected to teach in a Math Acceleration Academy.

In order for Math Acceleration Academy teachers to have a targeted **instructional focus** for the week, districts should analyze student assessment data to determine areas of greatest need. However, teachers should be given the autonomy draw from their own expertise to develop high-quality units and lessons (i.e., no mandated instructional materials or curriculum) to meet the specific needs of their students.

If districts and/or schools have **high-quality instructional materials (HQIM)** that align to the instructional focus for the week, the districts/schools should provide these materials to teachers to either use or adapt as appropriate based on students’ academic strengths and needs, as evidenced by assessment data.

**Math Academy Instructional Focus**

To determine the instructional focus(i) for the week, districts should analyze MCAS data, benchmark/interim assessment data, and/or other curriculum-based assessment data. Based on the analysis, districts should narrow the instructional focus(i) for the week to a limited number of key concepts and/or standards. Depending on the level of data available, districts should determine an instructional focus in one of two ways:

* **Targeted instructional focus by grade level** – Identify multiple instructional foci (different groupings of concepts/standards) for the Academy week for each grade level and assign a particular instructional focus (i.e., group of concepts and/or standards) to individual teachers who will then be grouped with students who require additional support or acceleration in that focus area.
* **General instructional focus by grade level** – Identify an instructional focus for each grade level. All teachers assigned to a particular grade level will use the same instructional focus to inform their planning and instruction.

Once the district has determined the instructional focus for the week it should identify high-quality instructional materials (HQIM) that align to the instructional focus. These materials should be shared with teachers for them to either use outright or adapt for the week. If a district does not have HQIM for teachers to use during the Academy week, districts should refer teachers to openly accessible HQIM resources (See “Math Resources” below for examples).

After a district has determined the instructional focus(i) for the week, gathered HQIM that align with the instructional focus, and selected teachers for the Academies, the district should either schedule planning meetings to review the instructional focus and HQIM, or email teachers this essential information to help them plan for the week. Districts should also consider providing teachers instructional expectations (see “Guidelines for Instruction”) for the week.

**Guidelines for Instruction**

During the Academy week, teachers should balance instructional time around the three aspects of Mathematical Rigor:

* **Conceptual Understanding** – Students should demonstrate their understanding of concepts in a variety of ways, such as number sentences, models, and written and verbal explanations.
* **Application** – Students should practice solving a wide range of problems in various contexts by reasoning, thinking, and applying the mathematics they have learned.
* **Procedural Fluency** – Students should be honing their computational skills and number sense.

Teachers are encouraged to begin lessons with the [application of math](https://robertkaplinsky.com/two-ways-integrate-problem-based-learning-unit-another-avoid/) in a realistic context (i.e., lessons should integrate problem-based learning). This allows students to contextualize the learning for the day, identify the skills necessary in real time, and make connections with other concepts. This also allows teachers to collect formative assessment data in real time related to procedural fluency and conceptual understanding. Teachers should also use “just in time” scaffolds when students demonstrate a need for support, rather than “just in case” scaffolds that focus on what students *might* need support with.

**Math Academy Sample Schedule**

|  |  |  |
| --- | --- | --- |
|  | **Sample Student Schedule** | **Sample Teacher Schedule** |
| 7:30 AM – 8:00 AM | Breakfast | Monitor breakfast |
| 8:00 AM – 10:00 AM | Daily problem solving #1  Small group work, centers, independent skills practice. | Set the theme/focus and objectives for the day.  Activator to establish the context for problem solving.  Direct instruction of concepts and procedures. Collecting formative assessment data through conferring and observations. |
| 10:00 AM – 11:00 AM | Specials class | Planning |
| 11:00 AM – 11:30 AM | Lunch | Lunch |
| 11:30 AM – 1:30 PM | Daily problem solving #2  Small group work, centers, independent skills practice. | Activator to establish the context for problem solving.  Direct instruction of concepts and procedures. Collecting formative assessment data through conferring and observations. |
| 1:30 PM - 2:00 PM | Daily wrap-up, reflection on the learning of the day, and next steps | Synthesize the learning of the day, encourage setting personal learning goals for tomorrow, highlight student work from the day. |

\* Teachers should build in movement breaks during long teaching blocks

**Math Resources**

* *Mathematics Core Instructional Materials* - DESE convenes panels of Massachusetts teachers to review and rate evidence on the quality and alignment of specific curricular materials, then publish their findings for educators across the Commonwealth to consult. See [here](https://www.doe.mass.edu/instruction/curate/?section=math) for Math reports.
* *Prioritizing and Understanding the Math Frameworks* - Use the [Standards Navigator](https://www.doe.mass.edu/frameworks/search/) to understand what all students should know and be able to do by the end of each school year. Use the Quick Reference guides and other resources on the [DESE STEM page](https://www.doe.mass.edu/stem/math/?section=resources#resources) to learn more about the development of procedural fluency through key grade spans.
* *Establishing Context for the Day* - Consider using tasks such as 3-act math (see more information [here](https://gfletchy.com/3-act-lessons/)) that are accessible yet also use relatable context and authentic application of math.
* *Conceptual Development and Procedural Fluency* - Consider accessible and interesting problems such as [open middle](https://www.openmiddle.com/) style problems that allow students to use their understanding of number systems and operations creatively.
* *Student Discussion* - Students must learn and apply the Standards for Mathematical Practice (see QRGs [here](https://www.doe.mass.edu/stem/math/?section=resources#resources)) to be successful doers and learners of Mathematics. Structured student discussion and debate is an excellent means to encourage deep conceptual understanding and engagement. Use NCTMs 5 Practices for Orchestrating Productive Mathematics Discussions (see resources [here](https://www.nctm.org/Publications/Mathematics-Teacher/2018/Vol111/Issue5/mt2018-03-366a/#:~:text=The%20five%20practices%20are%20the,%2C%20and%20(5)%20Connecting.) and [here](https://illustrativemathematics.blog/2018/01/09/the-5-practices-framework-explicit-planning-vs-explicit-teaching/)).
* *Illustrative Math Units - Putting It All Together* - Example lessons/units that can either be used outright (if the standards/concepts covered in a “Putting It All Together” unit aligns with the Academy’s instructional focus for a specific grade level) or can be used as a structure for teachers to work from as they plan problem-based lessons for the week.
  + [Grade 3, Unit 8](https://im.kendallhunt.com/k5/teachers/grade-3/unit-8/lessons.html) – Themes: Fraction Fun, Measurement and Data, Multiplication and Division Games, Create and Design
  + [Grade 4, Unit 9](https://im.kendallhunt.com/k5/teachers/grade-4/unit-9/lessons.html) – Themes: Reason with Fractions, Whole-number Operations, Solve Problems with Multiplication and Division, Creation and Design
  + [Grade 5, Unit 8](https://im.kendallhunt.com/k5/teachers/grade-5/unit-8/lessons.html) – Themes: Multiply and Divide Whole Numbers, Apply Volume Concepts, Fraction and Decimal Operations, Creation and Design
  + [Grade 6, Unit 9](https://im.kendallhunt.com/MS/teachers/1/9/index.html) – Themes: Making Connections, Voting
  + [Grade 7, Unit 9](https://im.kendallhunt.com/MS/teachers/2/9/index.html) – Themes: Running a Restaurant, Making Connections, Designing a Course
  + [Grade 8, Unit 9](https://im.kendallhunt.com/MS/teachers/3/9/index.html) – Themes: Tessellations, The Weather

# **Student Selection and Attendance**

**Student Selection**

After a district has identified focus standards for the week, districts and schools should analyze multiple sources of student-level data to determine which students would benefit the most from a high dose of targeted instruction during an Academy week. Because an Acceleration Academy should only focus on a few key standards/concepts, students who, based on data gathered throughout the school year, would benefit the most from targeted instruction to solidify their understanding of these key concepts and/or focus standards should be considered first for invitation to an Acceleration Academy. Students who, based on multiple data points, may require more prolonged interventions to master these concepts/standards should be considered for other, longer-term interventions.

As mentioned in the “Math Academy Instructional Focus” section, districts can identify multiple instructional foci (groups of key concepts/standards) to be taught during the Academy week and assign a particular instructional focus to individual teachers who will then be grouped with students who require additional support and/or acceleration in that focus area.

**Student Attendance**

Student participation in the Acceleration Academies will require a concerted effort by school administrators, teachers, and district leaders to inform students and parents about the accelerated learning opportunities provided by the Academies. Invitation to the Acceleration Academies should be viewed as a celebration of a student’s hard work and desire to learn, not as a required intervention.

* **Outreach:** The district and participating schools should inform both students and their families about the Acceleration Academies and promote the program as an opportunity for students to receive engaging, small group instruction led by exceptional teachers that will accelerate student learning.
* **Securing Commitment:** Invited students and their families should commit to attending for the duration of the program, and schools should clearly identify how and whether students will be able to get to and from school during the Academy week.
* **Creating a Waitlist:** This program’s effectiveness rests on students attending for at least 80% of the available instructional hours (at least 4 out of 5 days or 16 out of 20 instructional hours). If there are more students interested in attending, or if there are more students identified for intervention/acceleration than there are seats available, the district should create a waitlist to draw from if originally selected students drop out prior to, or in the first two days of, the Academy.
* **Incentivizing Student Attendance:** Consider engaging with the local business community and philanthropists to provide incentives for students who have perfect attendance. Students who choose to attend an Academy during their school vacation week should be celebrated and, if possible, rewarded for their commitment to learning.
* **Attendance Monitoring:** Getting students to attend on the first day will greatly impact attendance for the remainder of the Academy and missing even one day of instruction is almost equivalent to missing a week of instruction in one content area during a typical school week. Site facilitators and clerks/parent liaisons should closely monitor student attendance and call families of absent students each morning. If students withdraw from the program on the first day, site facilitators should invite waitlisted students to attend for the remainder of the week.

# **Teacher Recruitment and Selection**

Recruiting and selecting highly effective educators is paramount. To ensure classes are taught by highly effective teachers, districts should consider:

* Advertising the opportunity, and the highly competitive stipend, as widely as possible to attract the largest number of highly effective educators
* Selecting teachers through an application process that ensures highly effective teachers are chosen to teach during the Academy week. Criteria to consider:
  + Number of years of experience teaching math
  + SEI endorsement (especially if the district is planning to invite a high percentage of English Learners)
  + Professional development and/or accolades related to mathematics
  + If available, SGP of students taught by the educator over several years
  + Experience planning and teaching intensive, engaging, hands-on or project-based lessons
* Conducting classroom walk-throughs/observations throughout the Academy week to ensure instruction meets expectations and to provide feedback, if needed.

**Teacher Observations**

Site facilitators and/or academic coaches should observe teachers several times throughout the week and complete a teacher observation form for each teacher.

Site facilitators and/or academic coaches should also provide teachers constructive feedback throughout the week if they feel the feedback will help the teachers alter their instruction to better meet the needs of their students.

# **Grant Reporting**

As stated in the Grant Assurances document, districts awarded Math Acceleration Academies Grant funding are required to participate in grant monitoring and reporting. Outlined below are the reporting requirements for this grant. Please note, DESE will provide templates and directions to collect the required information prior to the reporting deadline. Please reach out to [Benie Capitolin](mailto:benie.h.capitolin@mass.gov) if you have any concerns about meeting a particular deadline.

**Grant Reporting Requirements**

Districts must prepare and submit to DESE the following materials **by late June/early July (exact date will be provided in the spring)**

* **Instructional Focus**
  + The instructional foci identified for each Math Acceleration Academy, including identified standards and key concepts by grade and subject
* **Student Recruitment, Selection, and Attendance**
  + Description of recruitment efforts and/or recruitment and outreach materials for families
  + Daily student attendance rosters for the Math Acceleration Academies (Absent, Present, Tardy) including students’ names, SASID, and current grade level.
* **Teacher Recruitment and Selection**
  + The general metrics used to recruit, identify, and hire teachers for the Math Acceleration Academies
  + The number of teachers who applied to teach in an Acceleration Academy and the number hired for each Academy
* **Observation Rubric(s)**
  + Observation rubric(s) used to facilitate feedback and coaching throughout the Acceleration Academy week(s)