

A quick guide for observing classroom content and practice

In an **7th grade science** class you should observe students engaged with at least one science concept and practice:

Science and Engineering Practices

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Science Concepts

Earth & Space Science (ESS2, ESS3)

- Explaining how Earth’s surface has changed over different scales
- Developing a model of the sun and Earth’s gravity in the water cycle
- Using data to explain that Earth’s resources are unevenly distributed
- Communicating how past geologic events are used to make predictions
- Constructing an argument about human activities and technologies on the consumption of resources

Life Science (LS1, LS2)

- Developing an argument that body systems interact for life functions
- Explaining how animal behaviors and plant structures lead to reproduction
- Interpreting data about available resources and organism populations
- Describing the relationship between organisms across ecosystems
- Developing a model to describe the transfer energy of matter in an ecosystem
- Analyzing data about disruptions to an ecosystem and population shifts
- Evaluating designs to protect an ecosystem
- Explaining biodiversity and resource availability within an ecosystem

Physical Science (PS2, PS3)

- Analyzing data about the effects of electric charges on the strength of electric forces
- Interpreting data on the relationship of kinetic energy, mass, and speed
- Developing a model of the relative position and energy of objects
- Creating a device to control thermal energy transfer
- Investigating relationships involved in energy transfer
- Providing evidence linking changes in motion to energy transfer
- Modeling energy transfer mechanisms
- Describing the relationship between kinetic and potential energy

Technology/Engineering (ETS1, ETS3)

- Constructing a prototype
- Explaining a communication system
- Comparing benefits and drawbacks of various communication systems
- Researching transportation systems
- Explaining how components of a structural system work together
- Using systems engineering to model components of technology systems

In **grade 7**, instructional time should focus on eight core ideas:

ESS

2. Earth’s Systems
3. Earth and Human Activity

LS

1. From Molecules to Organisms: Structures and Processes
2. Ecosystems: Interactions, Energy, and Dynamics

PS

2. Motion and Stability: Forces and Interactions
3. Energy

ETS

1. Engineering Design
3. Technological Systems

NOTES

STE What to Look For The example below features three Indicators from the [Standards of Effective Practice](#). These Indicators are just a sampling from the full set of Standards and were chosen because they create a sequence: the educator plans a lesson that sets clear and high **expectations**, the educator then delivers high quality **instruction**, and finally the educator uses a variety of **assessments** to see if students understand the material or if re-teaching is necessary. This example highlights teacher and student behaviors aligned to the three Indicators that you can expect to see in a rigorous 7th grade science classroom.

Expectations (Standard II, Indicator E)	Plans and implements lessons that set clear and high expectations and also make knowledge accessible for all students.					
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center; padding: 5px;">What is the teacher doing?</td> <td style="width: 50%; text-align: center; padding: 5px;">What are the students doing?</td> </tr> <tr> <td style="padding: 10px;"> <ul style="list-style-type: none"> •Creating culturally responsive lessons that engage and sustain student attention •Asking students to apply scientific knowledge and ideas when engaging with real-world problems •Showing students how to revise models to predict and explain science phenomena </td> <td style="padding: 10px;"> <ul style="list-style-type: none"> •Identifying a lesson's standards or objectives and how they connect to unit goals •Using information from observations to construct an evidence based account for natural phenomena •Constructing explanations using multiple sources of evidence </td> </tr> </table>			What is the teacher doing?	What are the students doing?	<ul style="list-style-type: none"> •Creating culturally responsive lessons that engage and sustain student attention •Asking students to apply scientific knowledge and ideas when engaging with real-world problems •Showing students how to revise models to predict and explain science phenomena 	<ul style="list-style-type: none"> •Identifying a lesson's standards or objectives and how they connect to unit goals •Using information from observations to construct an evidence based account for natural phenomena •Constructing explanations using multiple sources of evidence
What is the teacher doing?	What are the students doing?					
<ul style="list-style-type: none"> •Creating culturally responsive lessons that engage and sustain student attention •Asking students to apply scientific knowledge and ideas when engaging with real-world problems •Showing students how to revise models to predict and explain science phenomena 	<ul style="list-style-type: none"> •Identifying a lesson's standards or objectives and how they connect to unit goals •Using information from observations to construct an evidence based account for natural phenomena •Constructing explanations using multiple sources of evidence 					

Instruction (Standard II, Indicator A)	Uses instructional practices that reflect high expectations regarding content and quality of effort and work; engage all students; and are personalized to accommodate diverse learning styles, needs, interests, and levels of readiness.					
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center; padding: 5px;">What is the teacher doing?</td> <td style="width: 50%; text-align: center; padding: 5px;">What are the students doing?</td> </tr> <tr> <td style="padding: 10px;"> <ul style="list-style-type: none"> •Providing opportunities for students to communicate ideas, ask questions, and make their thinking visible in writing and speaking •Sharing conflict resolution strategies for working together with students •Modeling ways of using computation and analysis to find patterns in observations </td> <td style="padding: 10px;"> <ul style="list-style-type: none"> •Asking questions that challenge the premise(s) of an argument or the interpretation of data •Drawing explicitly upon content they have learned in class in conversations with peers •Analyzing observations to distinguish between correlation and causation </td> </tr> </table>			What is the teacher doing?	What are the students doing?	<ul style="list-style-type: none"> •Providing opportunities for students to communicate ideas, ask questions, and make their thinking visible in writing and speaking •Sharing conflict resolution strategies for working together with students •Modeling ways of using computation and analysis to find patterns in observations 	<ul style="list-style-type: none"> •Asking questions that challenge the premise(s) of an argument or the interpretation of data •Drawing explicitly upon content they have learned in class in conversations with peers •Analyzing observations to distinguish between correlation and causation
What is the teacher doing?	What are the students doing?					
<ul style="list-style-type: none"> •Providing opportunities for students to communicate ideas, ask questions, and make their thinking visible in writing and speaking •Sharing conflict resolution strategies for working together with students •Modeling ways of using computation and analysis to find patterns in observations 	<ul style="list-style-type: none"> •Asking questions that challenge the premise(s) of an argument or the interpretation of data •Drawing explicitly upon content they have learned in class in conversations with peers •Analyzing observations to distinguish between correlation and causation 					

Assessment (Standard I, Indicator B)	Uses a variety of informal and formal methods of assessments to measure student learning, growth, and understanding to develop differentiated and enhanced learning experiences and improve future instruction.					
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center; padding: 5px;">What is the teacher doing?</td> <td style="width: 50%; text-align: center; padding: 5px;">What are the students doing?</td> </tr> <tr> <td style="padding: 10px;"> <ul style="list-style-type: none"> •Providing students with feedback aligned to long-term goals •Conducting frequent checks for student understanding and adjusting instruction accordingly •Providing exemplars of work (e.g. historical examples, student work) </td> <td style="padding: 10px;"> <ul style="list-style-type: none"> •Engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts) •Conducting investigations with multiple controlled variables and considering the accuracy of the data or the methods •Using exemplars to inform their work </td> </tr> </table>			What is the teacher doing?	What are the students doing?	<ul style="list-style-type: none"> •Providing students with feedback aligned to long-term goals •Conducting frequent checks for student understanding and adjusting instruction accordingly •Providing exemplars of work (e.g. historical examples, student work) 	<ul style="list-style-type: none"> •Engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts) •Conducting investigations with multiple controlled variables and considering the accuracy of the data or the methods •Using exemplars to inform their work
What is the teacher doing?	What are the students doing?					
<ul style="list-style-type: none"> •Providing students with feedback aligned to long-term goals •Conducting frequent checks for student understanding and adjusting instruction accordingly •Providing exemplars of work (e.g. historical examples, student work) 	<ul style="list-style-type: none"> •Engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts) •Conducting investigations with multiple controlled variables and considering the accuracy of the data or the methods •Using exemplars to inform their work 					