Amplify Science

New York City Department of Education

Grade 8: Geology on Mars and Earth, Moon, and Sun

Summer Institute: Day 1

Date
Presented by Your Name

Overarching goals

By the end of this institute, you will be able to:

- Navigate program resources and describe how Amplify Science addresses 3-D learning and NGSS.
- Use unit resources to plan lessons that support ALL learners.

Getting to know the units

Day 1

Day 1 Objectives

By the end of today, you will be able to:

- Explain what students learn in the units, and how they learn it.
- Navigate the Amplify Science curriculum.
- Recognize how lessons engage students in the three dimensions of NGSS.

Norms: Establishing a culture of learners

Take risks: Ask any questions, provide any answers.

Participate: Share your thinking, participate in discussion and reflection.

Be fully present: Unplug and immerse yourself in the moment.

Physical needs: Stand up, get water, take breaks.

Geology on Mars/Earth, Moon, and Sun

Plan for the day – Day 1

- **Framing the day**
  - What is Amplify Science?
  - Navigating the Digital Guide
  - Amplify Science approach
- **Experiencing the launch unit**
  - Geology on Mars model lesson
  - Argumentation
- **Experiencing the core unit**
  - Earth, Moon, and Sun instructional sequence
  - Reflecting on the sequence
- **Closing**
  - Amplify Science in NYC
  - Reflection
  - Questions

Geology on Mars/Earth, Moon, and Sun

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Framing the day

The purpose of this part of the day is for you to

- Navigate the Amplify Science curriculum

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

+ Amplify.

Amplify Science

Middle school course curriculum structure

Middle School Curriculum New York City Edition

Grade 6

- Launch: Harnessing Human Energy
- Thermal Energy
- Populations and Resources
- Matter and Energy in Ecosystems
- Weather Patterns
- Ocean, Atmosphere,and Climate
- Earth's Changing Climate

Grade 7

- Launch: Microbiome
- Metabolism
- Phase Change
- Chemical Reactions
- Plate Motion
- Engineering Internship: Plate Motion
- Rock Transformations
- Engineering Internship: Earth's Changing Climate

Grade 8

- Launch: Geology on Mars
- Earth, Moon, and Sun
- Force and Motion
- Engineering Internship: Force and Motion
- Magnetic Fields
- Light Waves
- Traits and Reproduction
- Natural Selection
- Evolutionary History

Middle school course curriculum structure

Middle School Curriculum New York City Edition

Launch units

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Middle school course curriculum structure

Middle School Curriculum New York City Edition

Core units

Grade 6

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- Matter and Energy in Ecosystems
- Weather Patterns
- Ocean, Atmosphere,and Climate
- Earth's Changing Climate

Grade 7

- Launch: Microbiome
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Grade 8

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- Evolutionary History

Middle school course curriculum structure

Middle School Curriculum New York City Edition

Engineering Internships

Grade 6

- Launch: Harnessing Human Energy
- Thermal Energy
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- Matter and Energy in Ecosystems
- Weather Patterns
- Ocean, Atmosphere,and Climate
- Earth's Changing Climate

Grade 7

- Launch: Microbiome
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New York City Companions

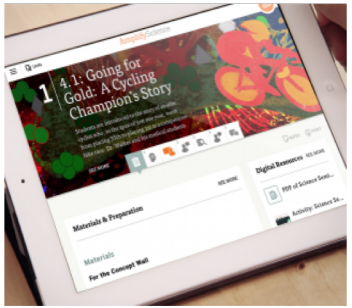
AmplifyScience

New York City Companion

Teacher Booklet: Grade 8

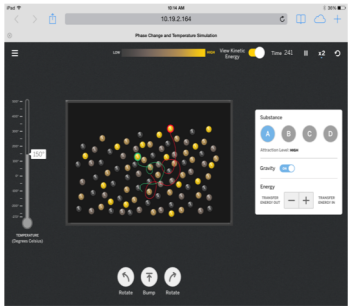
Table of Contents

Middle school components



Digital instructional materials

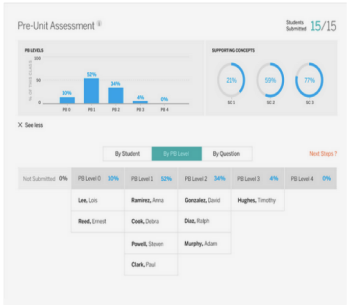
Optional investigation notebook



Simulations & other digital tools

Digital library

Hands-on materials



Assessments & reporting

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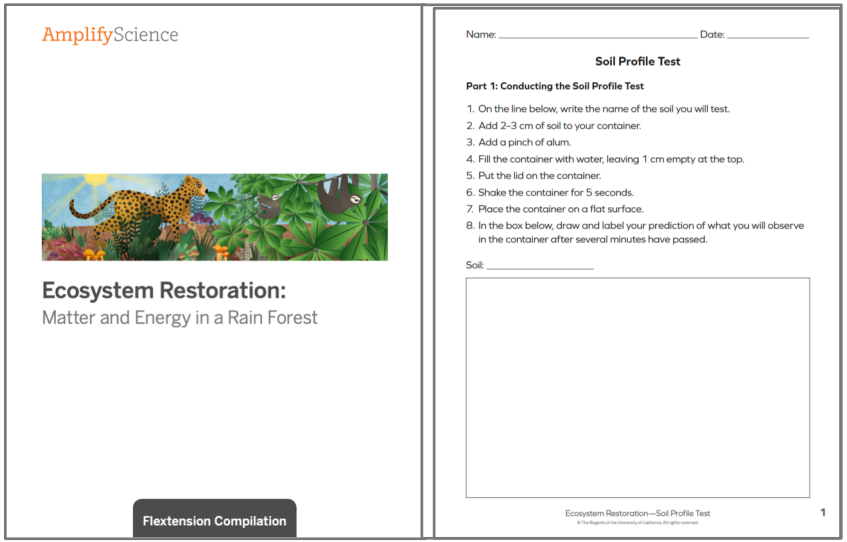
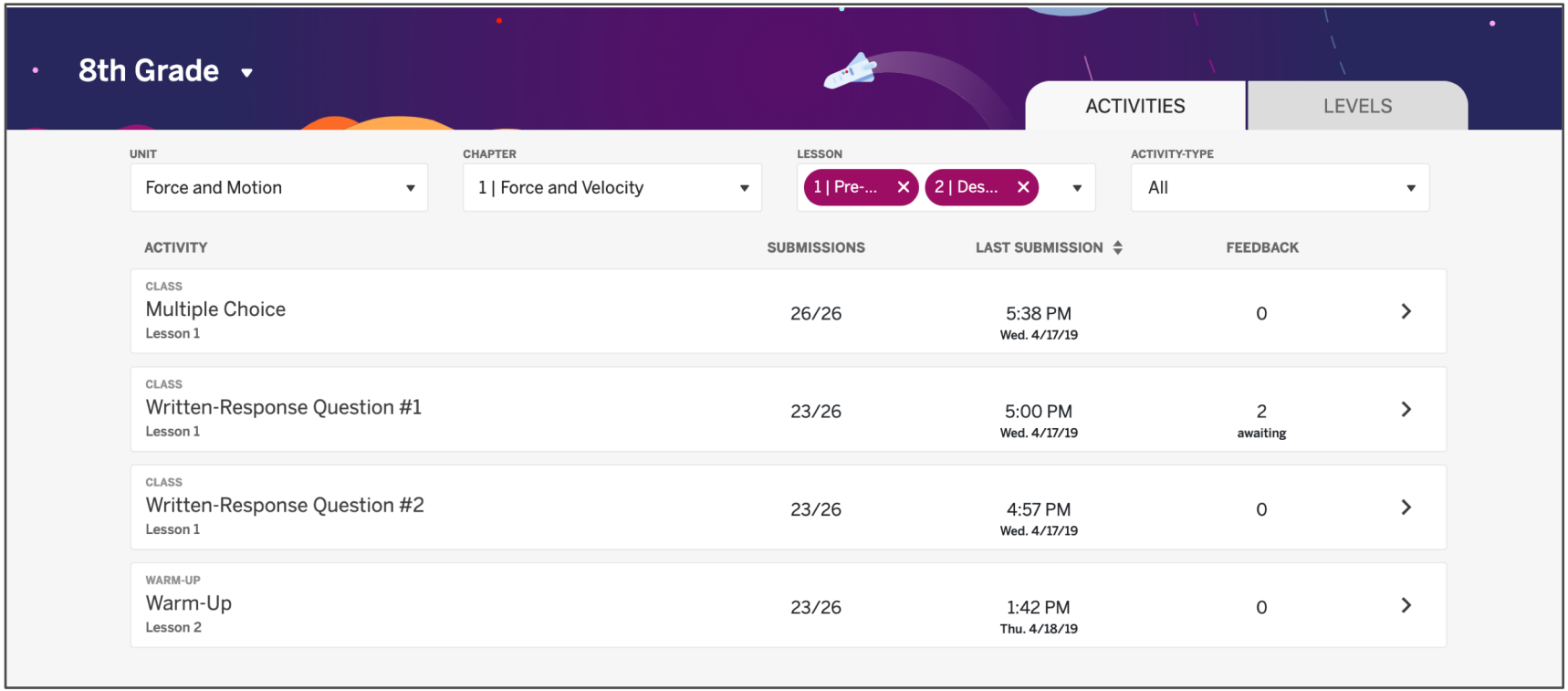
Amplify Science: What's new for 2019-2020



Hands-on Flextensions

Amplify Science: What's new for 2019-2020



Classwork

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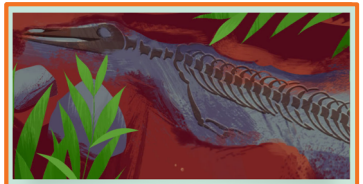
Teacher’s Guide navigation

Unit

Chapters

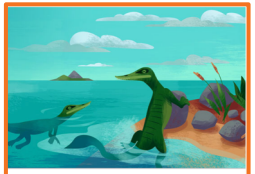
Lessons

Activities



19 Lessons

Plate Motion



Chapter 1: Introducing Earth's Outer Layer

4 Lessons

Chapter 2: Understanding Plate Boundaries

7 Lessons

Chapter 3: Investigating the Rate of Plate Movement

4 Lessons

Chapter 4: Science Seminar

4 Lessons

Lesson 1.1: Pre-Unit Assessment

SETTINGS

Lesson 1.2: Using Fossils to Understand Earth

Lesson 1.3: Exploring Earth's Plates

Lesson 1.4: Analyzing Patterns at Plate Boundaries

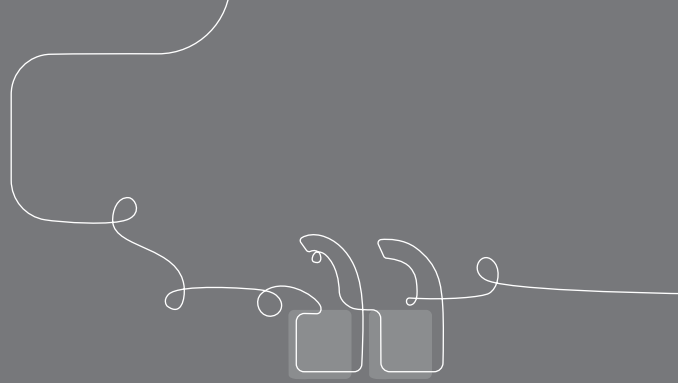
1 WARM-UP Warm-Up

2 SIM Simulating Earthquakes

3 MODELING TOOL Modeling a Plate Boundary

4 TEACHER-LED DISCUSSION Considering the Mesosaurus Exhibit

Amplify.

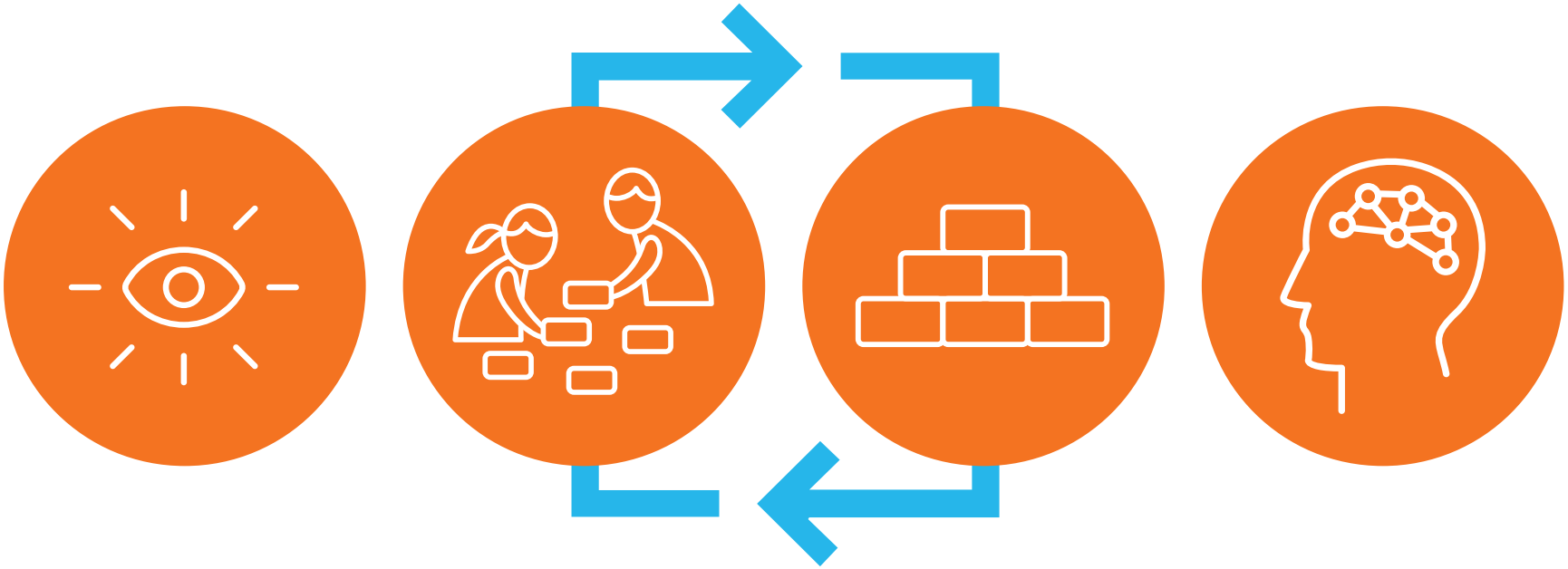


Questions?

Problem-based deep dives

Students inhabit the role of scientists and engineers to explain or predict phenomena. They use what they figure out to solve real-world problems.

Amplify Science approach



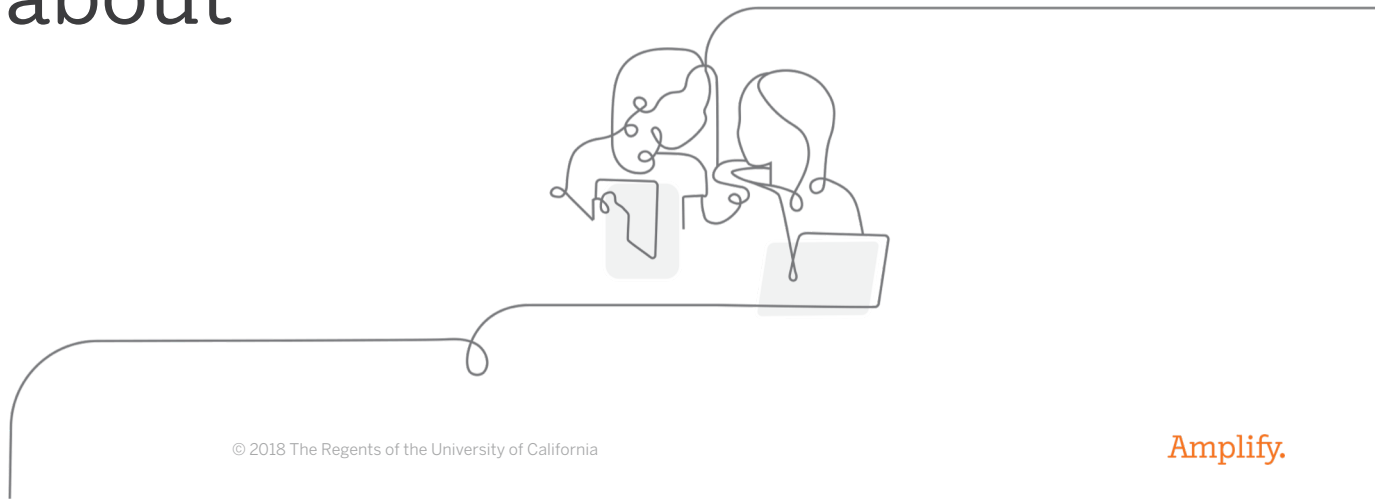
Introduce a phenomenon and a related problem

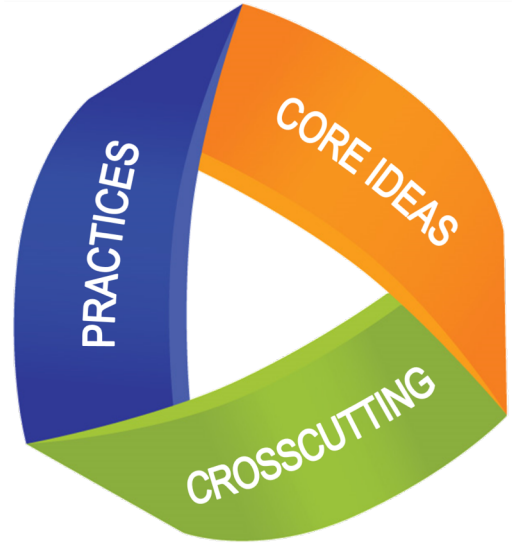
Collect evidence from multiple sources

Build increasingly complex explanations

Apply knowledge to a different context

Figure out, not learn about





Standards as three-dimensional performance expectations that integrate **disciplinary core ideas**, **science and engineering practices**, and **crosscutting concepts**

Geology on Mars/Earth, Moon, and Sun

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Experiencing the launch unit

The purpose of this part of the day is for you to

- Gain experience with the goals and structure of launch units.
- Learn about how the practice of argumentation is introduced in a launch unit to students.

Middle school course curriculum structure

Middle School Curriculum New York City Edition

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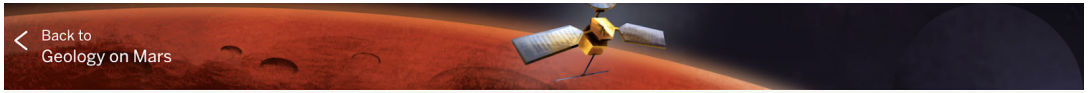
What is a Launch Unit?

- First unit of the year
- Focused on an interesting, immersive, and often surprising problem.
- Introduces practices that are integral to science, such as:
  - Argumentation
  - Reading
  - Writing
  - Talking about science ideas
  - Using models
- Introduces routines such as:
  - Active reading
  - Discourse routines

Launch unit: Geology on Mars



Chapter 1: Comparing Earth and Rocky Planets

To investigate habitability on Mars, students compare Mars and other rocky planets to Earth. Students consider a channel shaped by geologic processes on Mars, comparing it to landforms shaped by known geologic processes on

READ FULL OVERVIEW

1
1.1: Comparing Rocky Planets

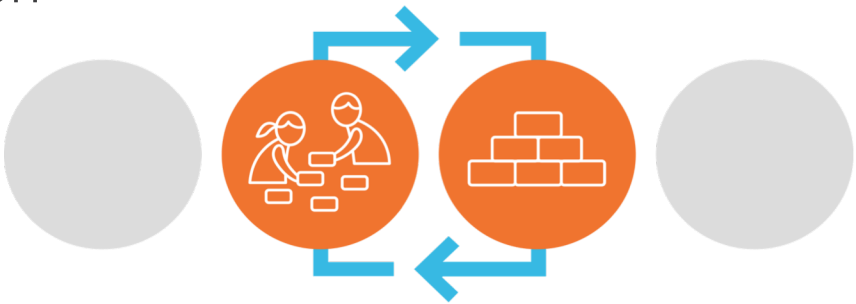
2
1.2: Observing the Surfaces of Mars and Earth

3
1.3: Investigating a Mystery Object on Mars

Argumentation in Amplify Science

Goals for argumentation in Amplify Science

- To provide students an authentic opportunity to engage in the practice of argumentation
- To make clear to students the purpose of argumentation and the role it plays in building and communicating scientific knowledge
- To help students build their own knowledge through argumentation



Geology on Mars/Earth, Moon, and Sun

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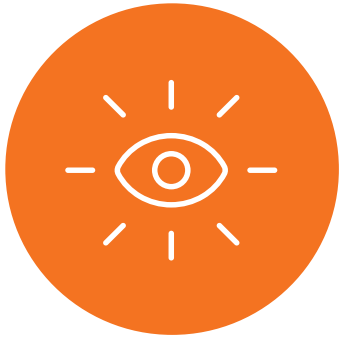
Experiencing the core unit

The purpose of this part of the day is for you to

- Explain what students learn in the core unit, and how they learn it.
- Recognize how lessons engage students in the three dimensions of NGSS (as appropriate).

Amplify Science approach



Introduce a phenomenon and a related problem

Earth, Moon, and Sun Instructional sequence

Chapter 1: Light and Dark on the Moon

JUMP DOWN TO CHAPTER OVERVIEW

Lesson 1.1:
Pre-Unit Assessment

SETTINGS

Lesson 1.2:
Picturing the Moon

Lesson 1.3:
Modeling Light and Dark on the Moon

Lesson 1.4:
Simulating Light and Dark on the Moon

Chapter 1: Light and Dark on the Moon

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Modeling Light and Dark on the Moon

Lesson 1.4:
Simulating Light and Dark on the Moon

Chapter 2: Moon Phases

JUMP DOWN TO CHAPTER OVERVIEW

Lesson 2.1:
"Phases of the Moon"

Lesson 2.2:
Gathering Evidence About Moon Phases

Lesson 2.3:
Simulating Moon Phases

Lesson 2.4:
Moon Phase Patterns

Lesson 2.5:
Orbit and the Pattern of Moon Phases

Lesson 2.6:
Critical Juncture Assessment

SETTINGS

Lesson 2.7:
Taking on New Challenges

Chapter 2: Moon Phases

JUMP DOWN TO CHAPTER OVERVIEW

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Geology on Mars/Earth, Moon, and Sun

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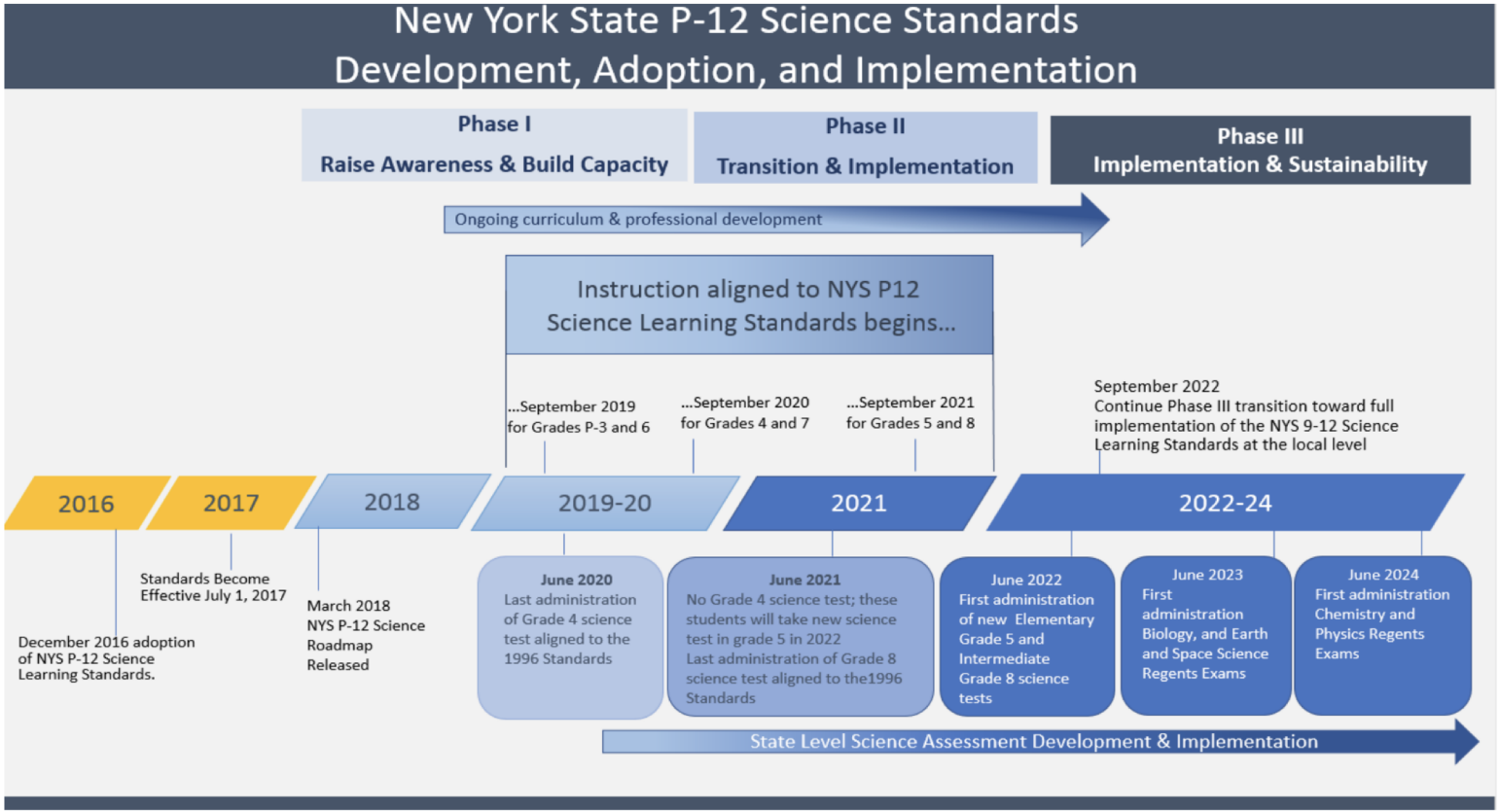
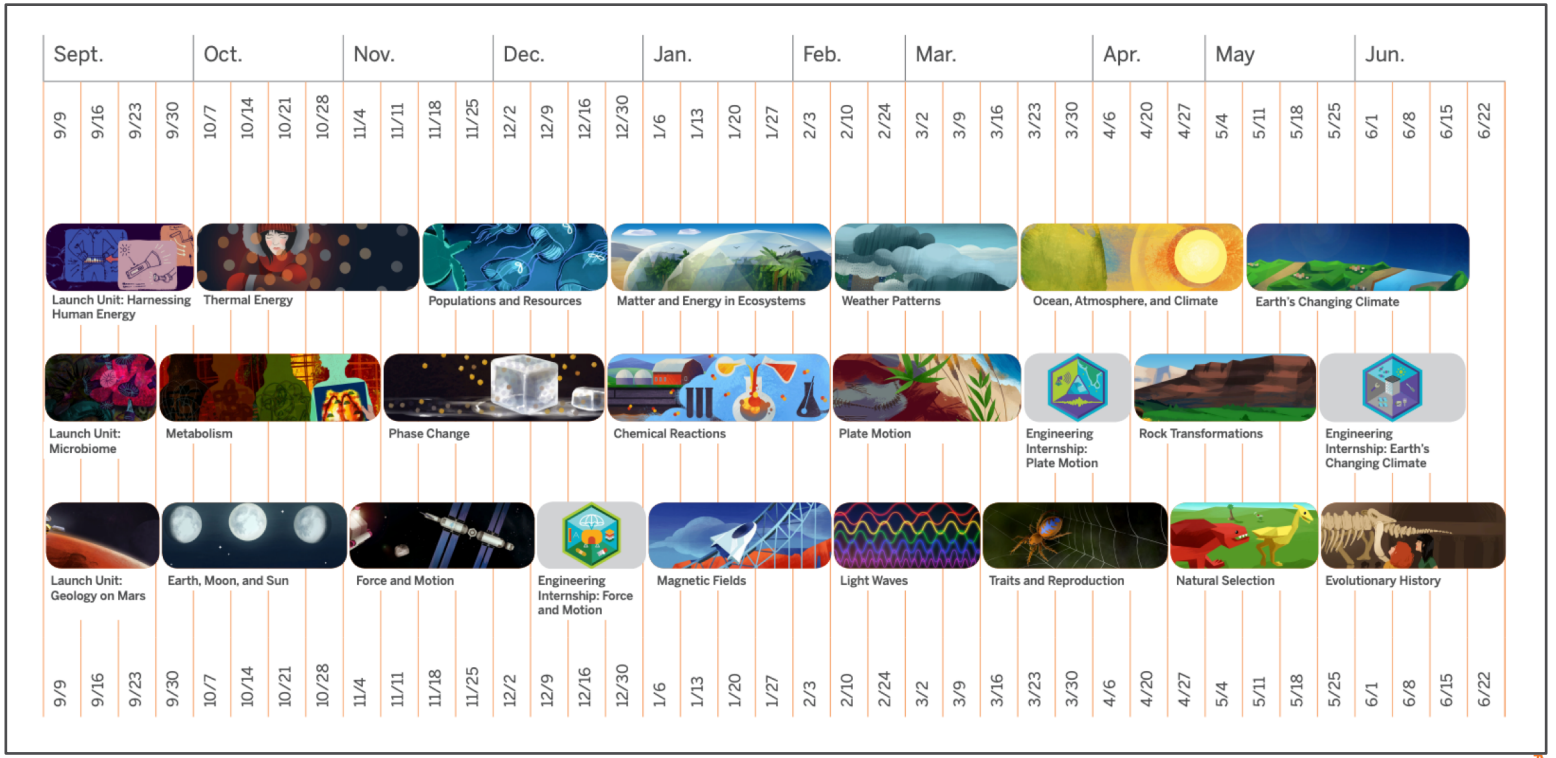
Amplify Science in NYC



Planning your year

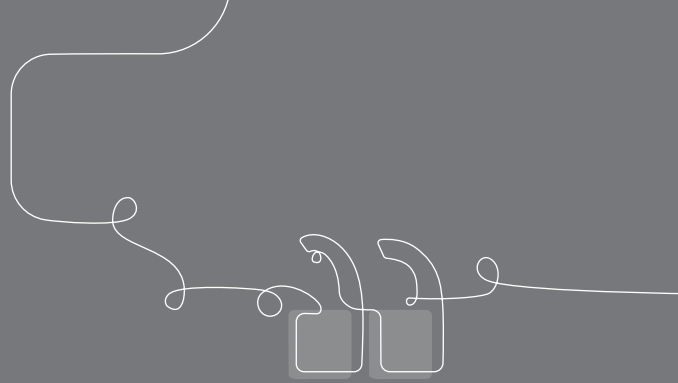
Overview: Amplify Science 6-8 course structure and pacing



Self-reflection and closing

The purpose of this part of the day is for you to

- Reflect on your ability to navigate the Teacher's Guide and your understanding of the Amplify Science Approach and how it supports three-dimensional learning.



Questions?

Day 1 Objectives

By the end of today, you will be able to:

- Explain what students learn in the units, and how they learn it.
- Navigate the Amplify Science Curriculum.
- Recognize how lessons engage students in the three dimensions of NGSS (as appropriate).

Overarching goals

By the end of this institute, you will be able to:

- Navigate program resources and describe how Amplify Science addresses 3-D learning and NGSS.
- Use unit resources to plan lessons that support ALL learners.

Amplify Science

New York City Department of Education

Grade 8: Geology on Mars and Earth, Moon, and Sun

Summer Institute: Day 2

Date
Presented by Your Name

Overarching goals

By the end of this institute, you will be able to:

- Navigate program resources and describe how Amplify Science addresses 3-D learning and NGSS.
- Use unit resources to plan lessons that support ALL learners.

Day 1 Objectives

After yesterday, you should be able to:

- Explain what students learn in the unit, and how they learn it.
- Navigate the Amplify Science Curriculum.
- Recognize how lessons engage students in the three dimensions of NGSS (as appropriate).

Day 2 Objectives

By the end of today, you will be able to:

- Articulate how lesson activities support ALL students with building complex explanations.
- Identify the multiple types of assessments embedded within the Amplify Science curriculum.
- Apply program resources to plan to teach.

Norms: Establishing a culture of learners

Take risks: Ask any questions, provide any answers.

Participate: Share your thinking, participate in discussion and reflection.

Be fully present: Unplug and immerse yourself in the moment.

Physical needs: Stand up, get water, take breaks.

Geology on Mars/Earth, Moon, and Sun

Plan for the day – Day 2

- **Framing the day**
  - Culture building
  - Unit Guide navigation
- **Story of the unit**
  - Coherence
  - Progress Build
- **Supports for instructional decisions**
  - Amplify Science assessment System
  - Formative assessment
  - Reporting
- **Planning to teach**
  - Classwork
  - NYC Companion explore
  - Unit pacing
- **Closing and reflection**
  - Reflection
  - Survey

Geology on Mars/Earth, Moon, and Sun

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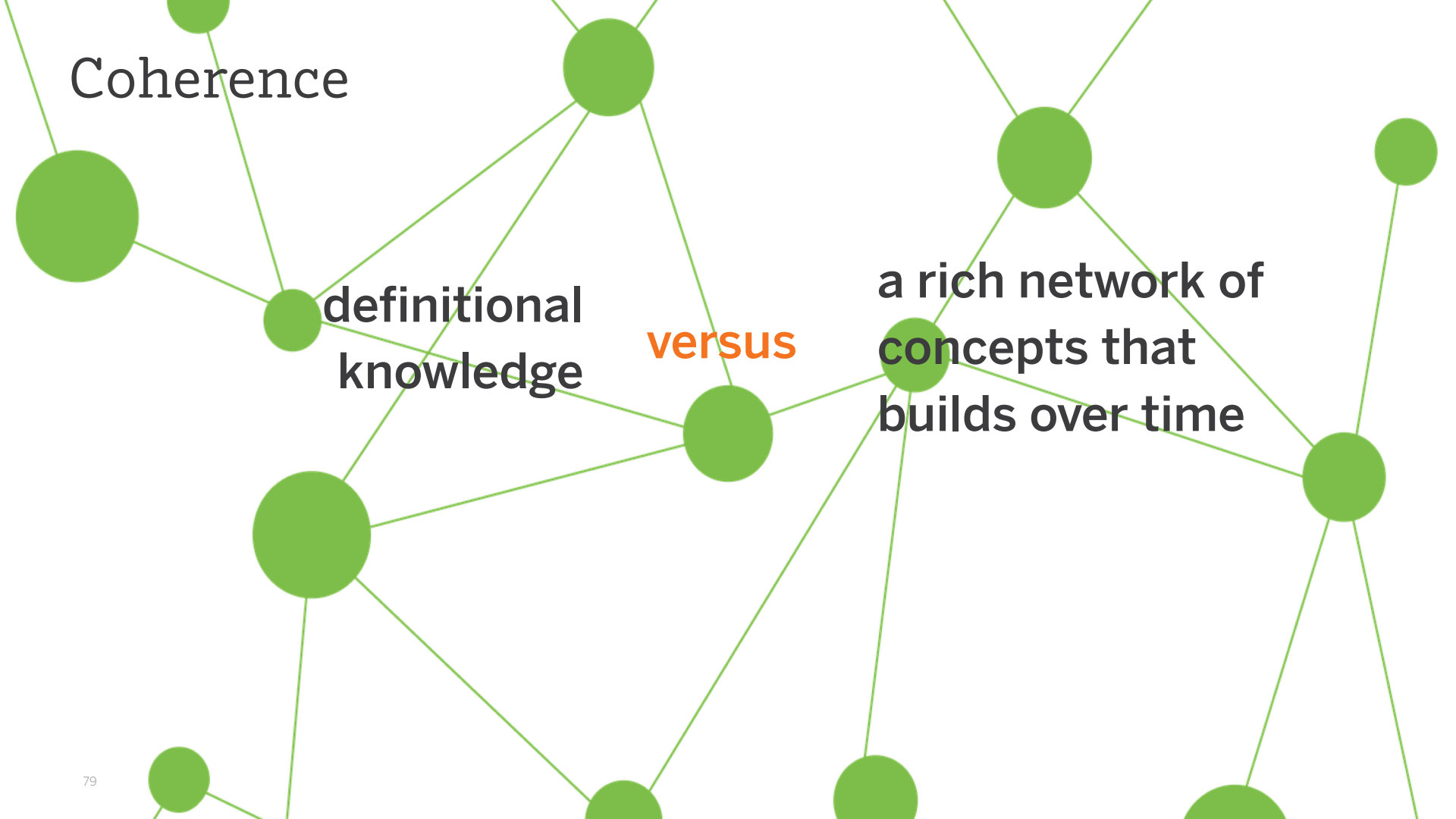
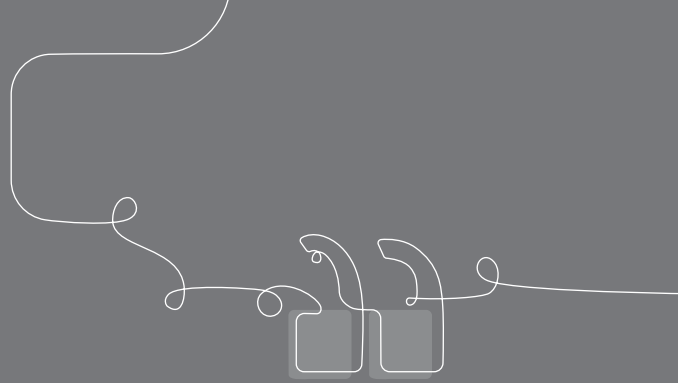
Coherence

from knowing a list of ideas

to knowing how ideas fit together

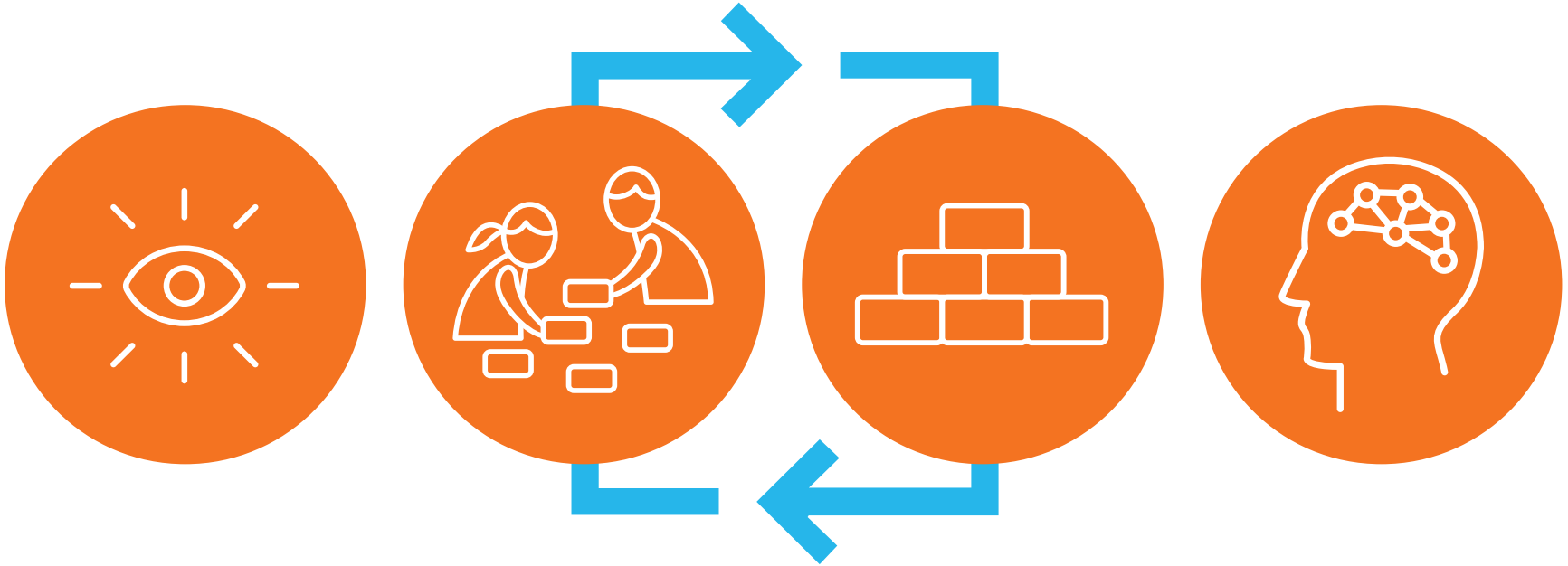
Coherence


definitional knowledge
versus
a rich network of concepts that builds over time



Questions?

Amplify Science approach

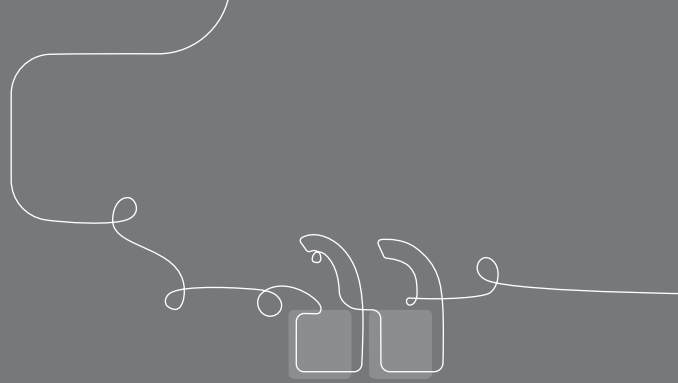


Introduce a phenomenon and a related problem

Collect evidence from multiple sources

Build increasingly complex explanations

Apply knowledge to a different context



Questions?

Geology on Mars/Earth, Moon, and Sun

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Supports for instructional decisions

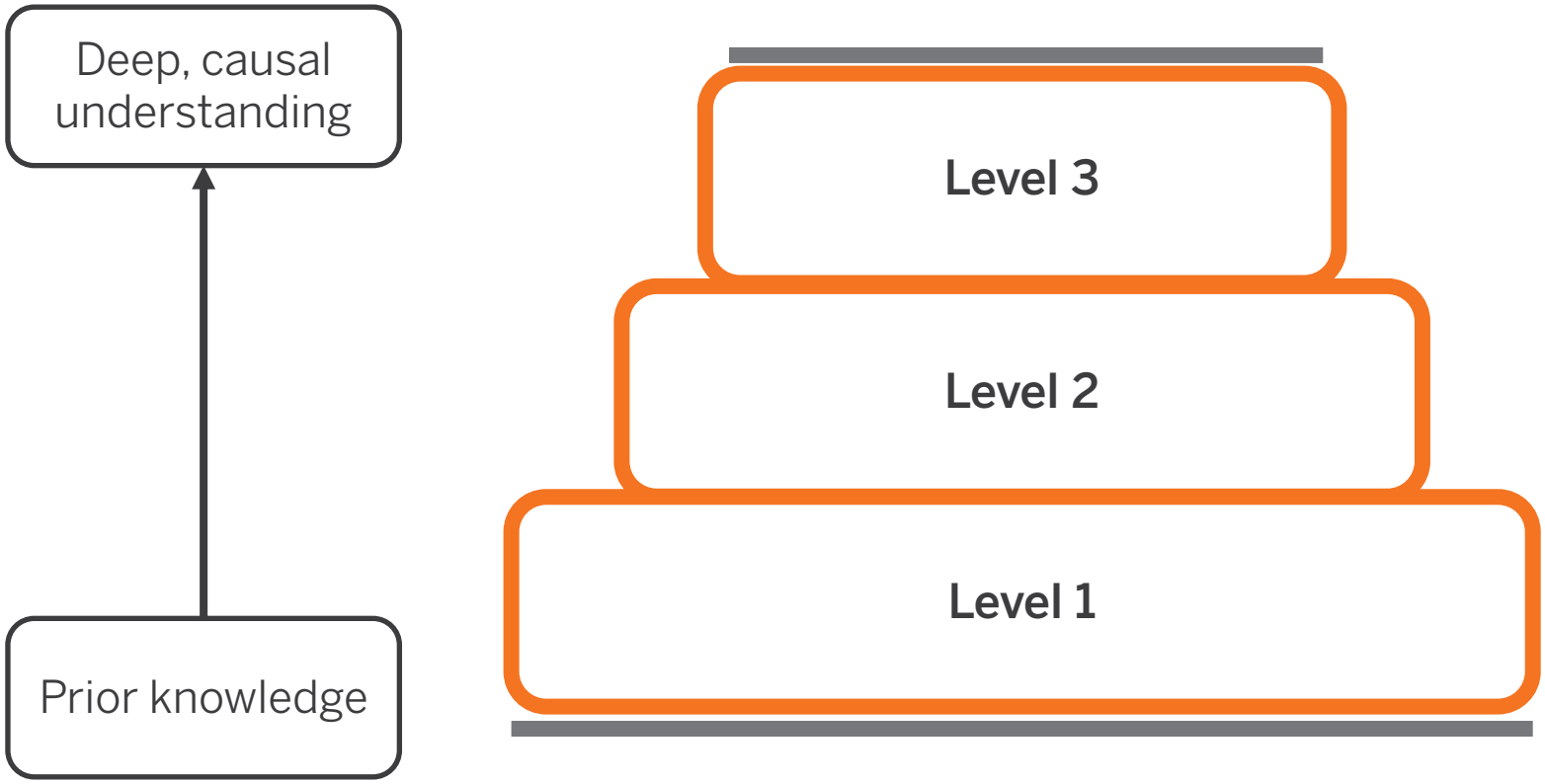
The purpose of this part of the day is for you to

- Identify the multiple types of assessments embedded within the Amplify Science curriculum.

Amplify Assessment System

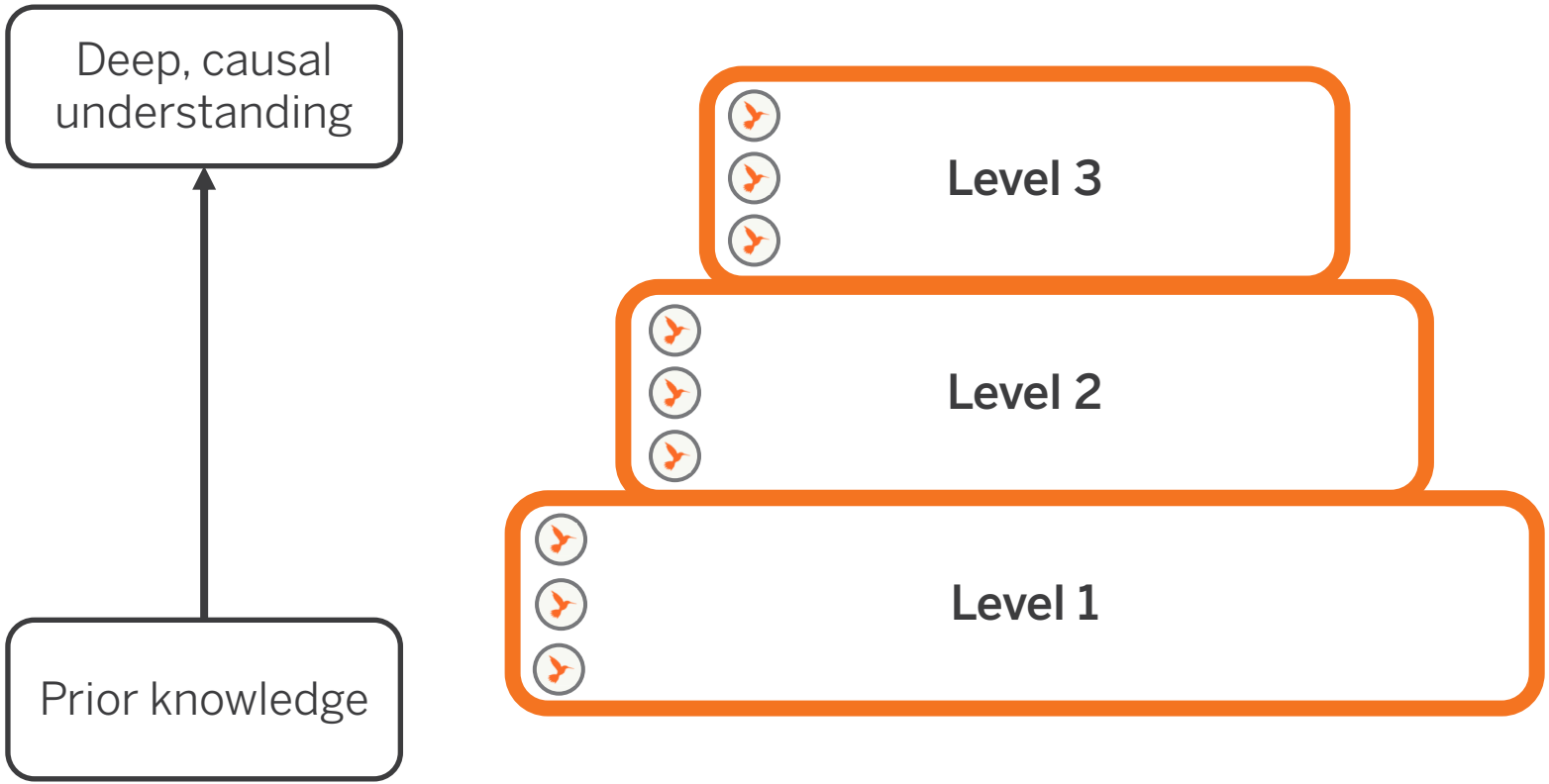
- Credible
- Actionable
- Timely

Pre- and End-of-Unit Assessments

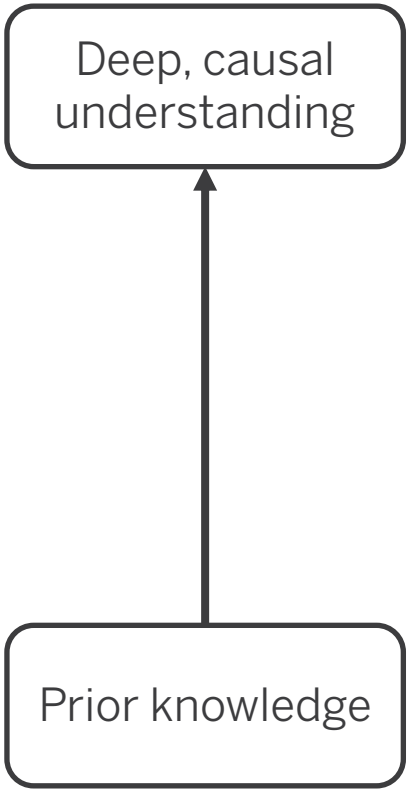


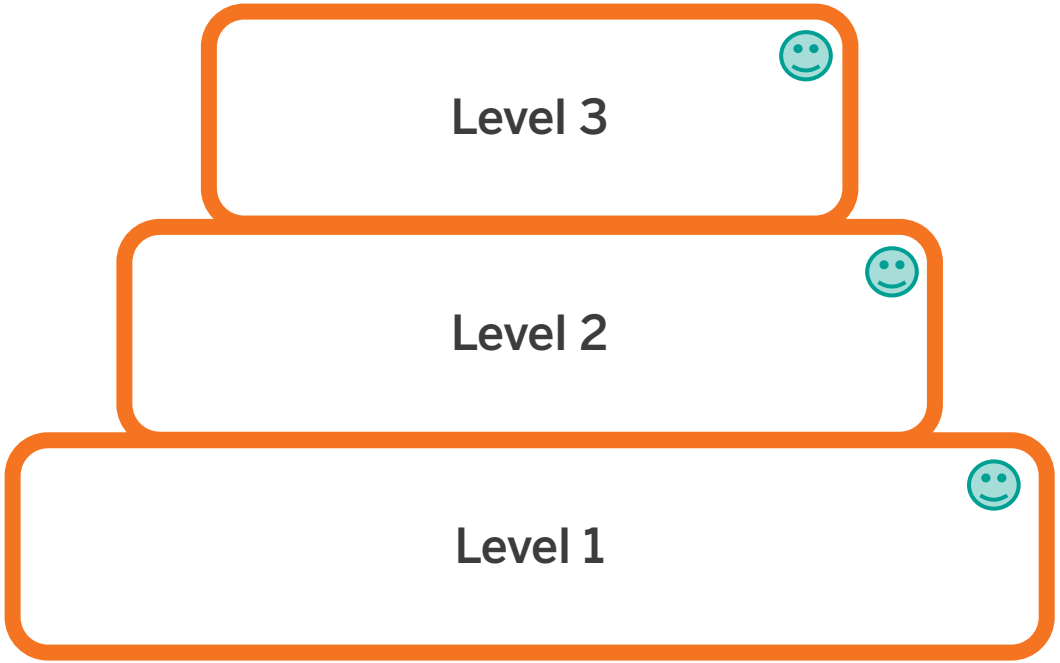
Critical Juncture Assessments

On-the-Fly Assessments

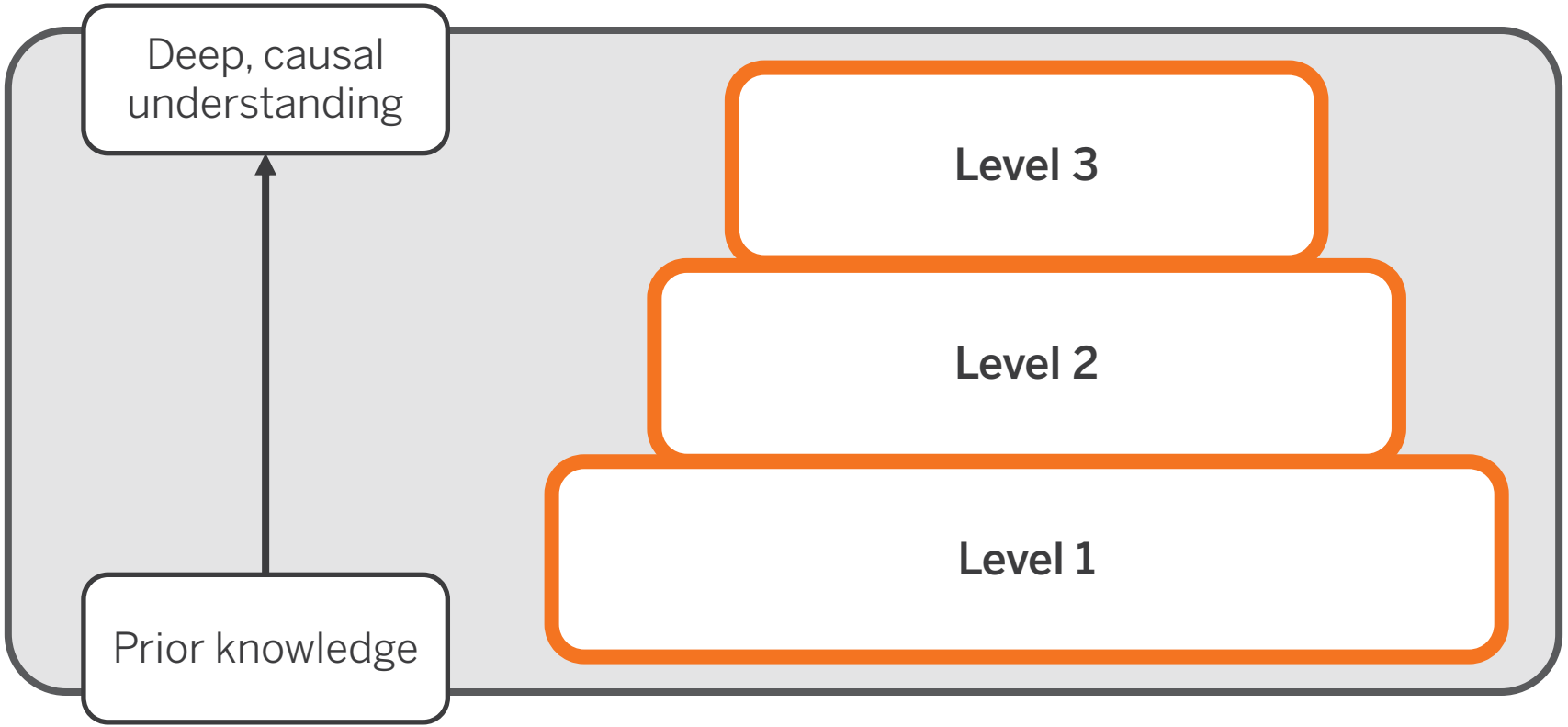


Student Self-Assessments





Portfolio Assessment



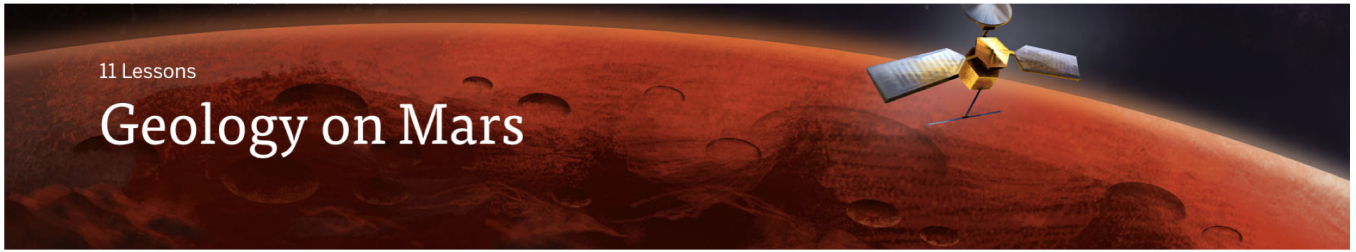
Investigation Assessment

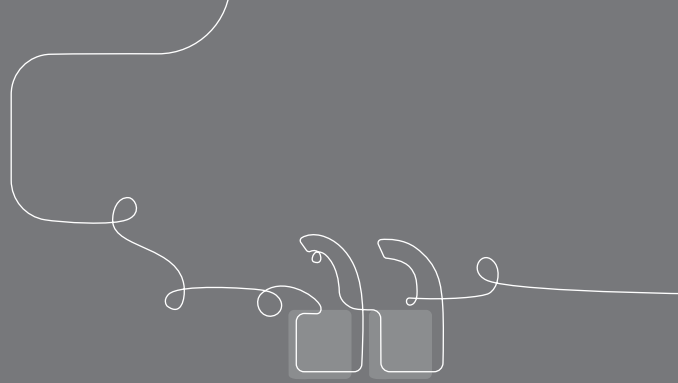
JUMP DOWN TO UNIT GUIDE

GENERATE PRINTABLE TEACHER'S GUIDE

From unit landing page, select "**JUMP DOWN TO UNIT GUIDE**" to access unit-level resources

Launch unit assessments



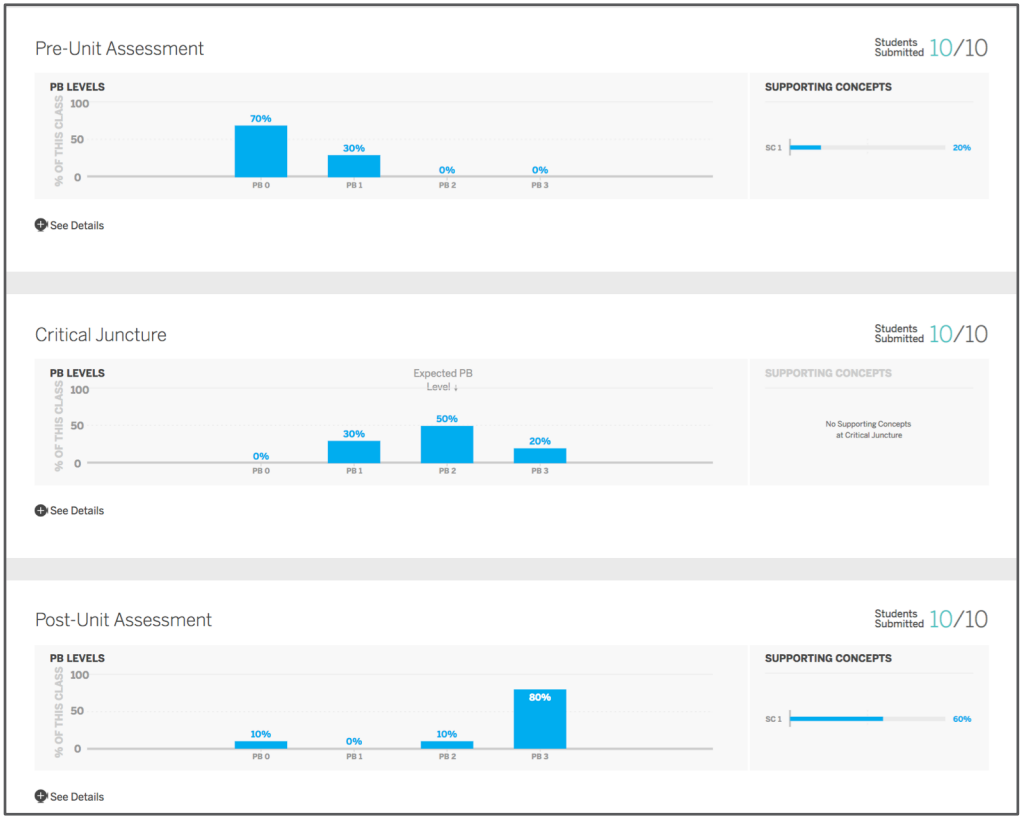


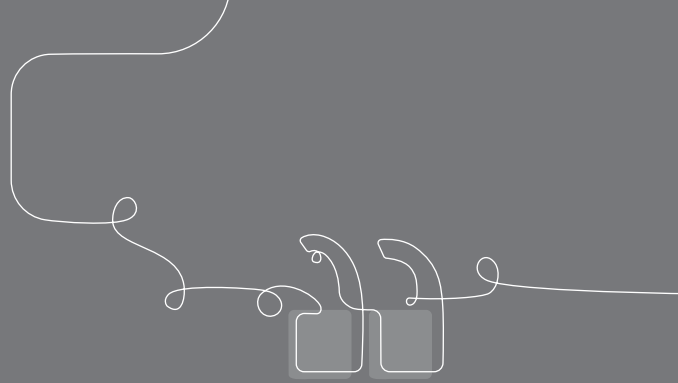
Questions?

Formative assessment

Reporting

Reporting


Pre-Unit Assessment
Students Submitted 10/10
PB LEVELS
% OF THIS CLASS
100
50
0
70%
30%
0%
0%
PB 0
PB 1
PB 2
PB 3
SUPPORTING CONCEPTS
SC 1
20%
See Details
Critical Juncture
Students Submitted 10/10
PB LEVELS
Expected PB Level ↓
0%
30%
50%
20%
SUPPORTING CONCEPTS
No Supporting Concepts at Critical Juncture
See Details
Post-Unit Assessment
Students Submitted 10/10
PB LEVELS
10%
0%
10%
80%
SUPPORTING CONCEPTS
SC 1
60%
See Details



Questions?

Geology on Mars/Earth, Moon, and Sun

Plan for the day – Day 2

- **Framing the day**
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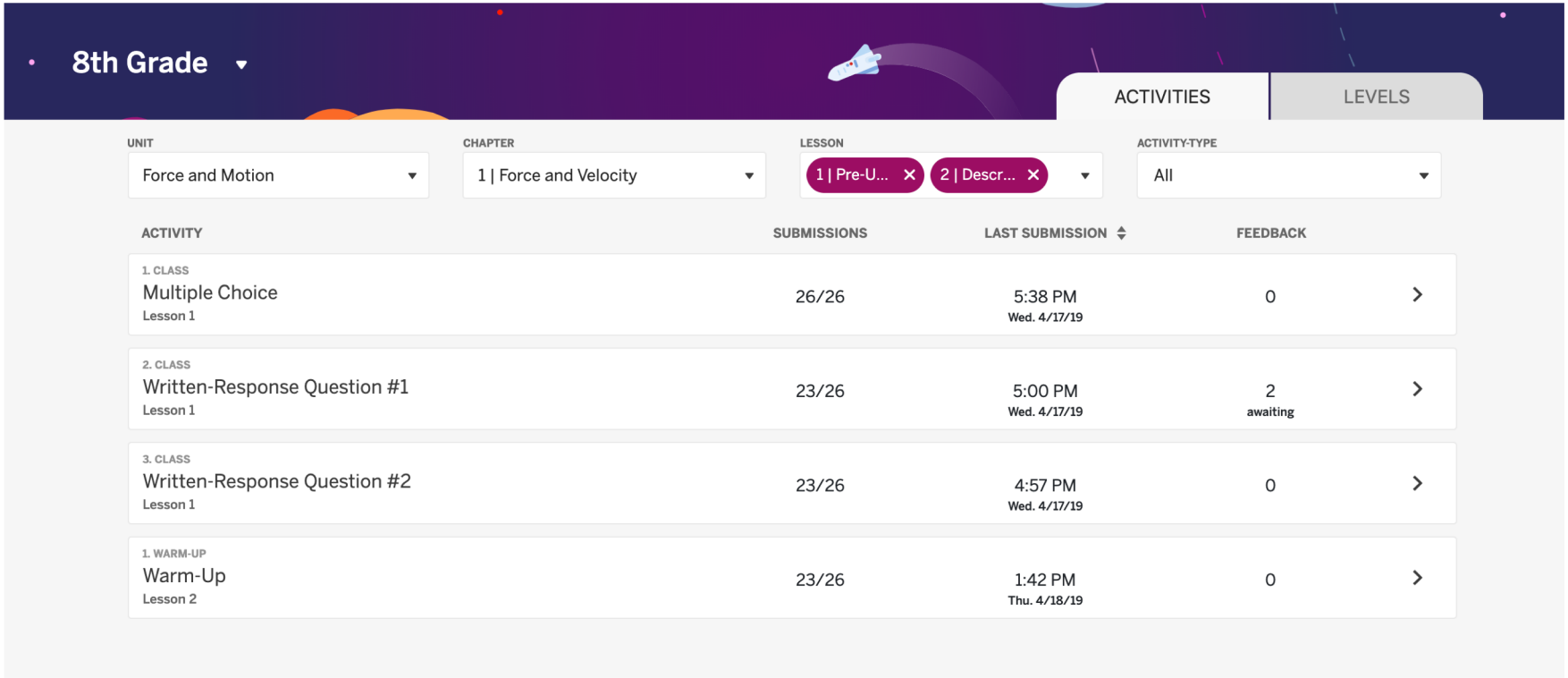
Planning to teach

The purpose of this part of the day is for you to

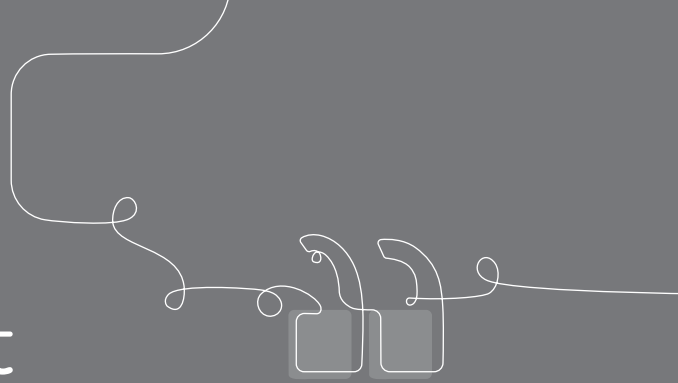
- Apply program resources to plan to teach.

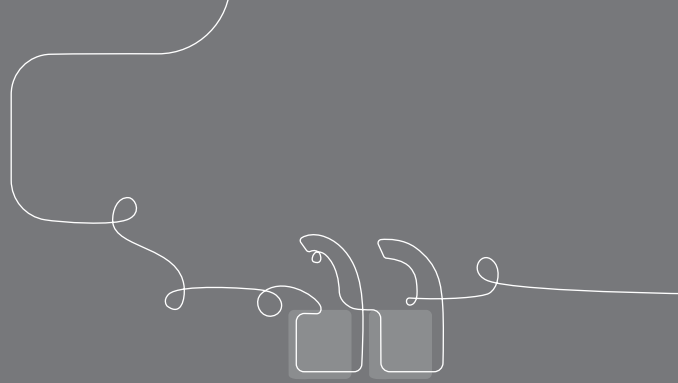
Classwork


8th Grade
ACTIVITIES
LEVELS
UNIT
Force and Motion
CHAPTER
1 | Force and Velocity
LESSON
1 | Pre-U...
2 | Descr...
ACTIVITY-TYPE
All
ACTIVITY
SUBMISSIONS
LAST SUBMISSION
FEEDBACK
1. CLASS
Multiple Choice
Lesson 1
26/26
5:38 PM
Wed. 4/17/19
0
2. CLASS
Written-Response Question #1
Lesson 1
23/26
5:00 PM
Wed. 4/17/19
2
awaiting
3. CLASS
Written-Response Question #2
Lesson 1
23/26
4:57 PM
Wed. 4/17/19
0
1. WARM-UP
Warm-Up
Lesson 2
23/26
1:42 PM
Thu. 4/18/19
0

Formative assessments not recommended for grading

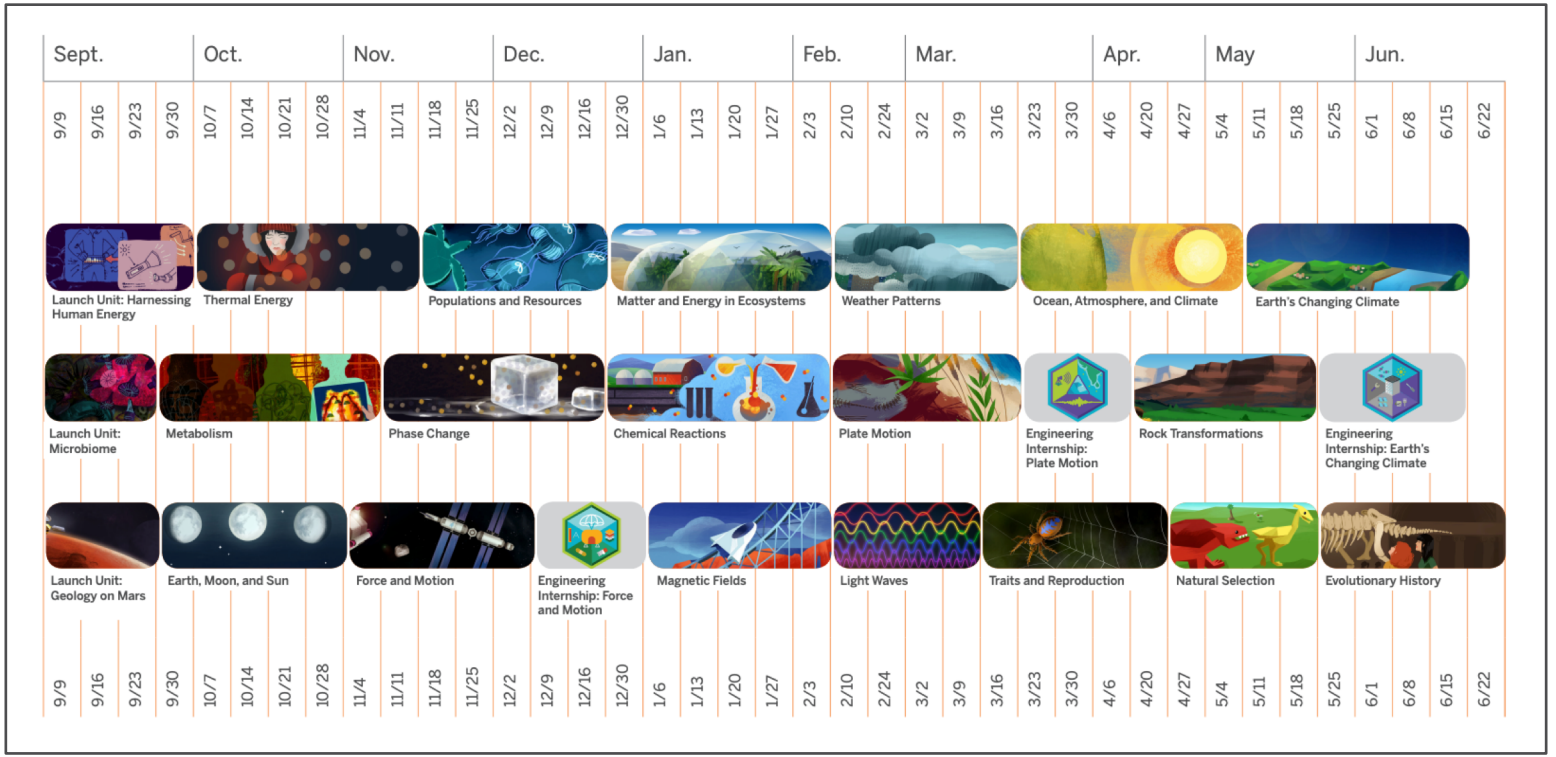
- Pre-Unit Assessment
- Critical Juncture Assessment
- On-the-Fly Assessments





Questions?

2019-2020 NYC unit pacing



Amplify.

NYC Companion Lessons

Lesson 1: Reading "How You Are Like a Sneezing Iguana"

Overview

The article "How You Are Like a Sneezing Iguana" leverages students' understanding of interactions between body systems in order to introduce how body systems work together to maintain homeostasis. Following the Active Reading approach, students first read and annotate the article on their own, then they discuss their annotations with a partner. To deepen their understanding, students reread a section of the article that describes how the human body maintains homeostasis during physical exertion. The purpose of this lesson is for students to learn that body systems, including cells, tissues, and organs, work together to maintain homeostasis.

Recommended Placement: *Metabolism*, after Lesson 3.2
Suggested Time Frame: 60 minutes

NYS P–12 Science Learning Standards

Performance Expectations	• **MS-LS1-3:** Construct an explanation supported by evidence for how the body is composed of interacting systems consisting of cells, tissues, and organs working together to maintain homeostasis.
Disciplinary Core Ideas	• **PS3.D: Energy in Chemical Processes and Everyday Life:** ° Cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. (secondary to MS-LS1-7)

Instructional Guide

First Read of "How You Are Like a Sneezing Iguana"

1. **Introduce the article and make a connection to students' background knowledge.**
   - You have been learning about how human body systems work together to get important molecules to the cells so they can release energy. Today, you will read an article called "How You Are Like a Sneezing Iguana" that builds on what you know about body systems.
   - It may seem strange to compare humans and sneezing iguanas. What could you have in common with a sneezing iguana? In a moment, you will read to find out more.
2. **Model Active Reading.** Read the first few sentences of the article aloud. Ask questions and make connections as you model the Active Reading process.
3. **Review Active Reading Guidelines.** Before students begin reading, point out the Active Reading Guidelines on the classroom wall.
4. **Prompt students to read and annotate independently.** Direct students to the article in their student booklets. Circulate as students read, providing support as needed.
5. **Review the process for discussing annotations.** When most students have finished reading and annotating, explain that students will choose one or two annotations to share with a partner. They should select questions or connections that they find interesting or those that will help them better understand what they read.
6. **Provide a moment for students to select the annotations they will share with their partners.**
7. **Prompt partners to discuss annotations.** Circulate as pairs discuss, using the Annotation Tracker and listening for questions and connections that you would like to invite students to share during the class discussion.
8. **Prompt partners to prepare for class discussion.** Ask them to choose an interesting or unanswered question or connection that they would like to share with the class. Explain that they can discuss the same annotations they shared with their partners if the questions are still unresolved.
9. **Facilitate a brief class discussion about annotations.** Invite students to share their questions and connections. Encourage students to respond to one another and to look back at the article in order to answer their peers' questions.
10. **Highlight exemplary or noteworthy annotations.** Refer to your Annotation Tracker and invite students to share those annotations you noted. Provide specific, positive feedback as students share, noting when annotations show evidence of Active Reading. Examples might include annotations that make a connection to science ideas, use vocabulary from the unit, or instances in which students were able to answer their own questions.

Second Read of "How You Are Like a Sneezing Iguana"

Part 1

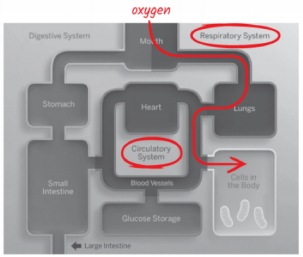
Reread paragraphs 2 and 3 of the article "How You Are Like a Sneezing Iguana." As you read, highlight information that helps you explain why you breathe faster when you exercise. You will use that information to help you answer the questions in Part 2.

Part 2

A cyclist starts a race. As she pedals, she begins to breathe faster. Why?

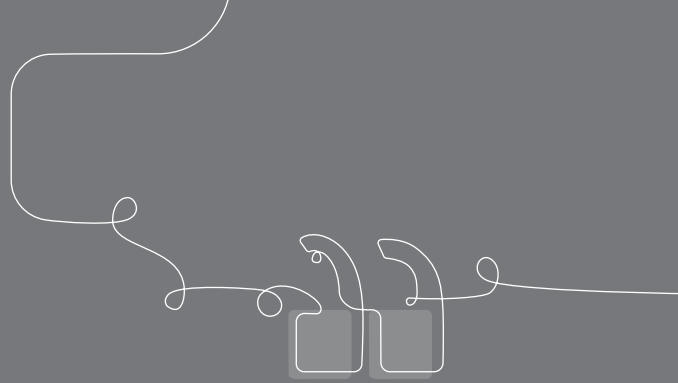
The cyclist breathes faster to take in more oxygen. Her muscle cells are using more oxygen, so taking in more oxygen helps keep the level of oxygen in her body stable.

How do the cyclist's body systems work together as she breathes faster? You can add notes to the diagram below to explain your thinking.



The respiratory system delivers oxygen to the circulatory system, which delivers the oxygen to the muscle cells.

Amplify.



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Closing and reflection

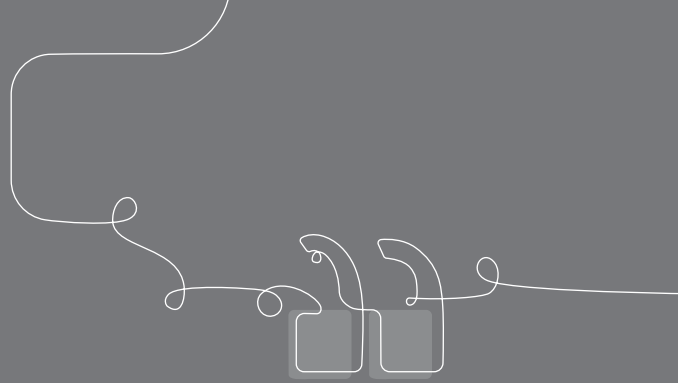
The purpose of this part of the day is for you to

- Reflect on the learning for the day.

Overarching goals

By the end of this institute, you will be able to:

- Navigate program resources and describe how Amplify Science addresses 3-D learning and NGSS.
- Use unit resources to plan lessons that support ALL learners.



Questions?