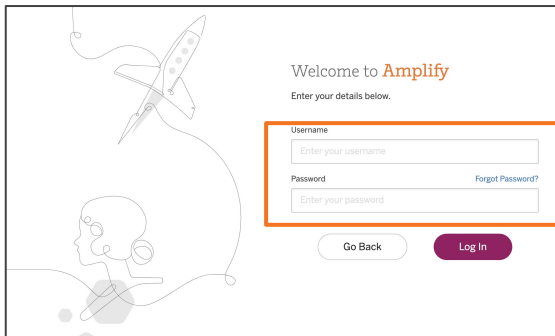
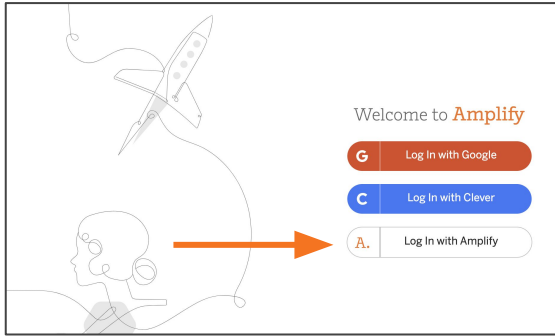
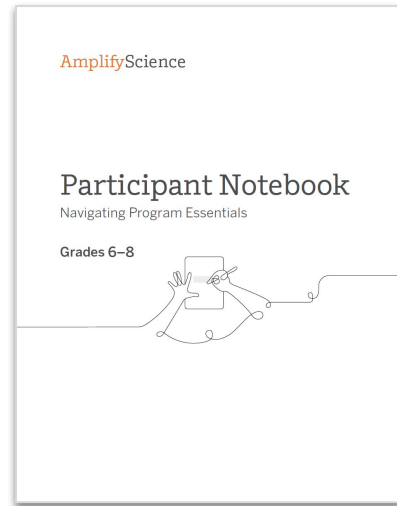


Welcome to Amplify Science!

Do Now: Login and open your digital participant packet



1. Go to **learning.amplify.com**
2. Select **Log in with Amplify**
3. Enter teacher demo account credentials
 - nycdoe_middle@tryamplify.net
 - Password: AmplifyNumber1
4. Explore as we wait to begin



Use two windows for today's webinar

Window #1

Meet - Etiwanda Grade 7 N x +
meet.google.com/hcs-dxpk-wrm?aut...

Miller Copy of Navigation Prop... x Amplify Curriculum
apps.learning.amplify.com/curriculum/#unit/8a31e095506df82015256f884b4544_californiaintegrated2019-2020#progress-build

Amplify Science CALIFORNIA > Plate Motion

OPEN PRINTABLE PROGRESS BUILD

Progress Build Level 1: The Earth's entire outer layer (below the water and soil that we see) is made of solid rock that is divided into plates. Earth's plates can move.

Underneath the soil, vegetation, and water that we see on the surface of Earth is the outer layer of Earth's geosphere, the solid part of our rocky planet. This outer layer of Earth is covered entirely with hard, solid rock that is divided into sections called plates. And, these plates can move.

Progress Build Level 2: The plates move on top of a soft, solid layer of rock called the mantle. At plate boundaries where the plates are moving away from each other, rock rises from the mantle and hardens, adding new solid rock to the edges of the plates. At plate boundaries where plates are moving toward each other, one plate moves underneath the other and sinks into the mantle.

Underneath the soil, vegetation, and water that we see on the surface of Earth is the outer layer of Earth's geosphere, the solid part of our rocky

Getting Ready to Teach
Materials and Preparation

Flexension Compilation
Investigation Notebook
NGSS Information for Parents and Guardians
Print Materials (11" x 17")
Print Materials (8.5" x 11")
Offline Preparation
Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.
Offline Guide

Window #2

Amplify Curriculum
apps.learning.amplify.com/curriculu...
Amplify Science CALIFORNIA > Plate Motion > Chapter 1 > Lesson 1.2

Lesson 1.2:
Using Fossils to Understand Earth

Lesson Brief (4 Activities) 1 WARM-UP Warm-Up T TEACHER-LED DISCUSSION Why Geologists Value Fossils 2 TEACHER-LED DISCUSSION Introducing Mesos

RESET LESSON GENERATE PRINTABLE LESSON

Lesson Brief

Overview
Materials & Preparation
Differentiation
Español rds

Digital Resources
All Projections
Completed Scientific Argumentation Wall Diagram
Video: Meet a Paleontologist
The Ancient Mesosaurus

Amplify Science

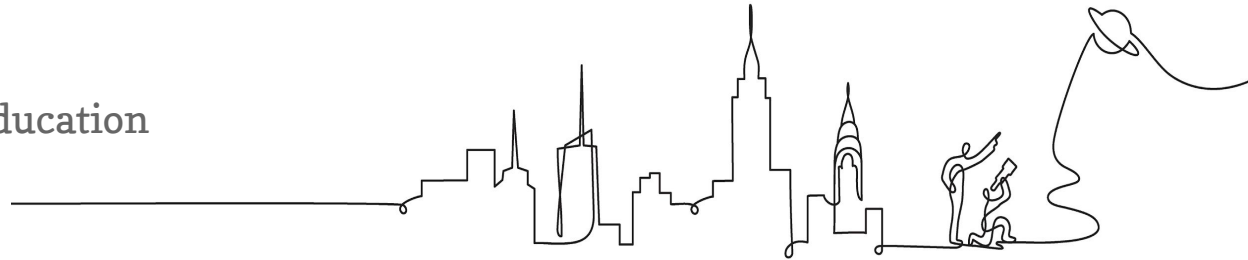
New York City

Introduction to Amplify Science NYC Summer Institute, Day 1

Grade 8: Geology on Mars & Force and Motion

New York City Department of Education
July 21, 2020

Presented by

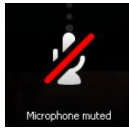


Remote Professional Learning Norms



Orient yourself to the platform

- *“Where’s the chat box? Where’s the mute button?”*



Mute your microphone unless sharing with the group



Use the chat box for posting questions or responses



Have a note-catcher

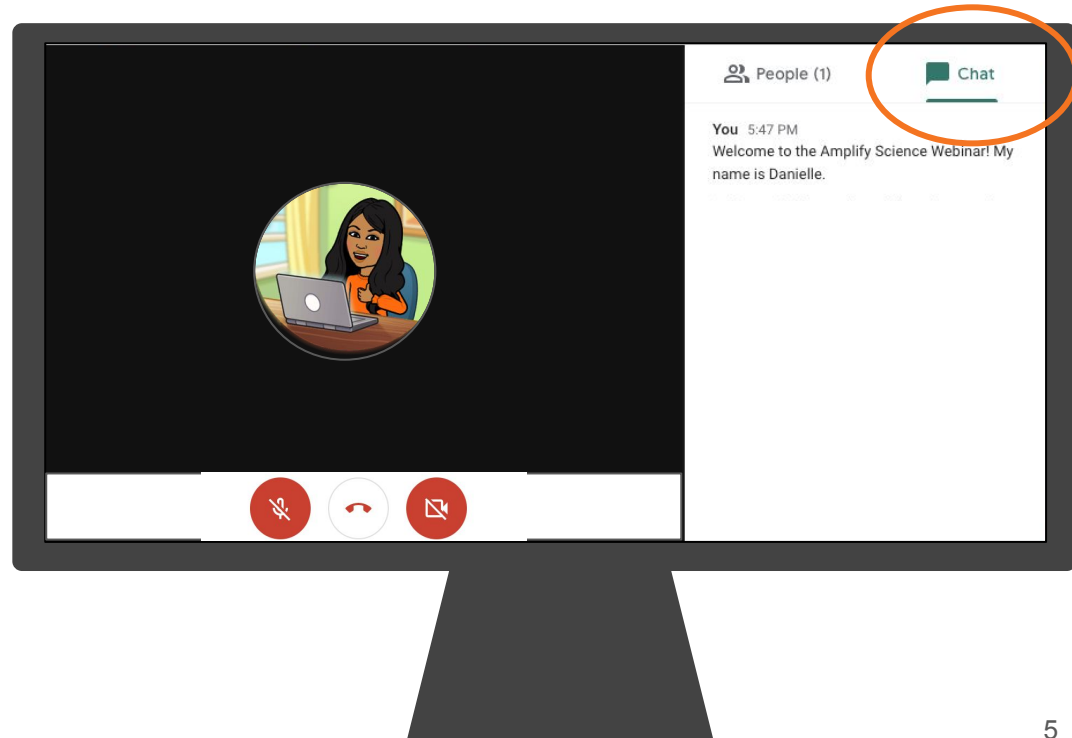


Engage at your comfort level - chat, ask questions, discuss.

Introductions!

Who do we have in the room today?

- **Question 1:** What do you love about teaching science?
- **Question 2:** What do you need to learn today and tomorrow to feel confident with this new curriculum?



Overarching goals

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

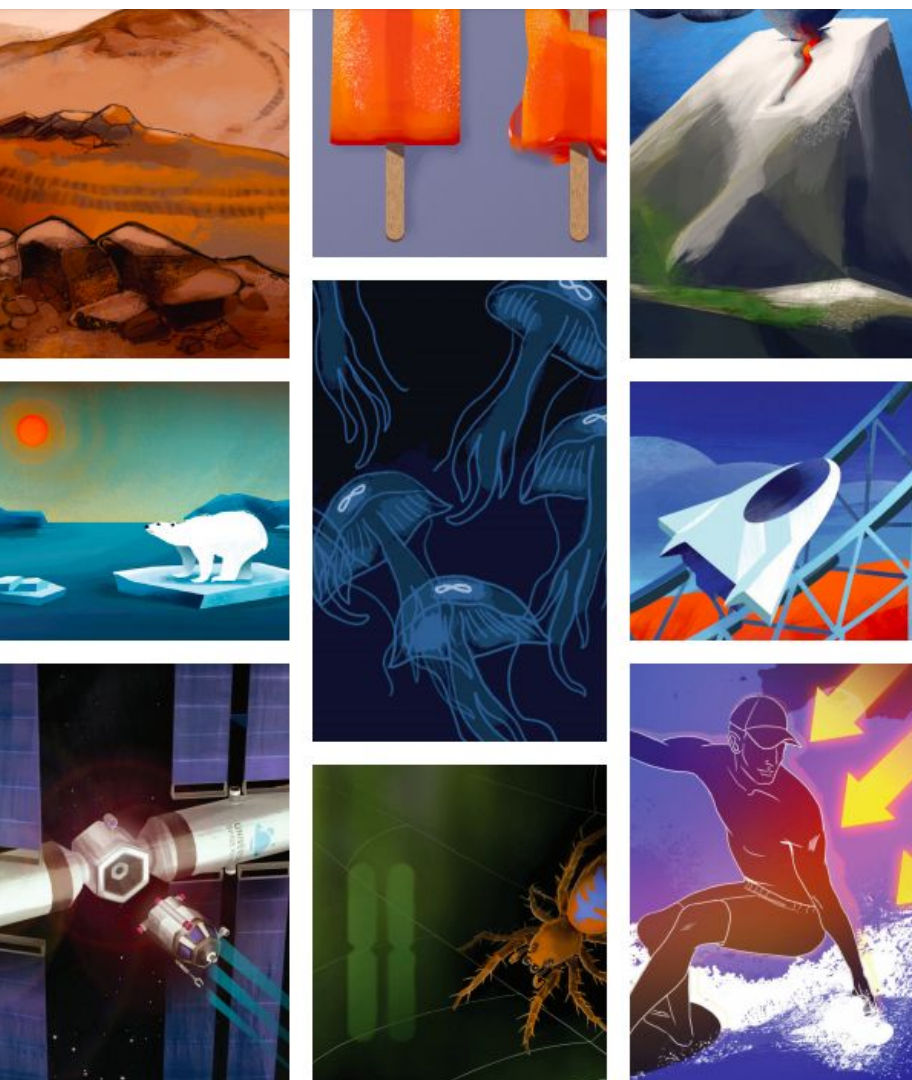
- Navigate the Amplify Science curriculum.
- Understand the program's multimodal approach and instructional materials.
- Apply program essentials to prepare to teach an Amplify Science unit.
- Make an informed decision about which of the Amplify Science Hybrid Learning Resources will best support your students.



Day 1 Objectives

By the end of today you will be able to:

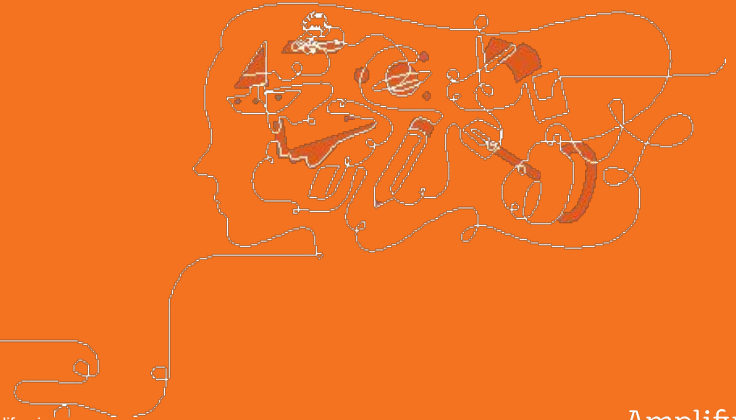
- Navigate the Amplify Science curriculum.
- Understand the program's phenomenon-based approach and instructional materials.



Plan for the day

- What is Amplify Science?
- Navigation essentials
- Teaching a phenomenon-based lesson
- Unit Guide Resources
- Assessments
- Closing and reflection

What is Amplify Science?





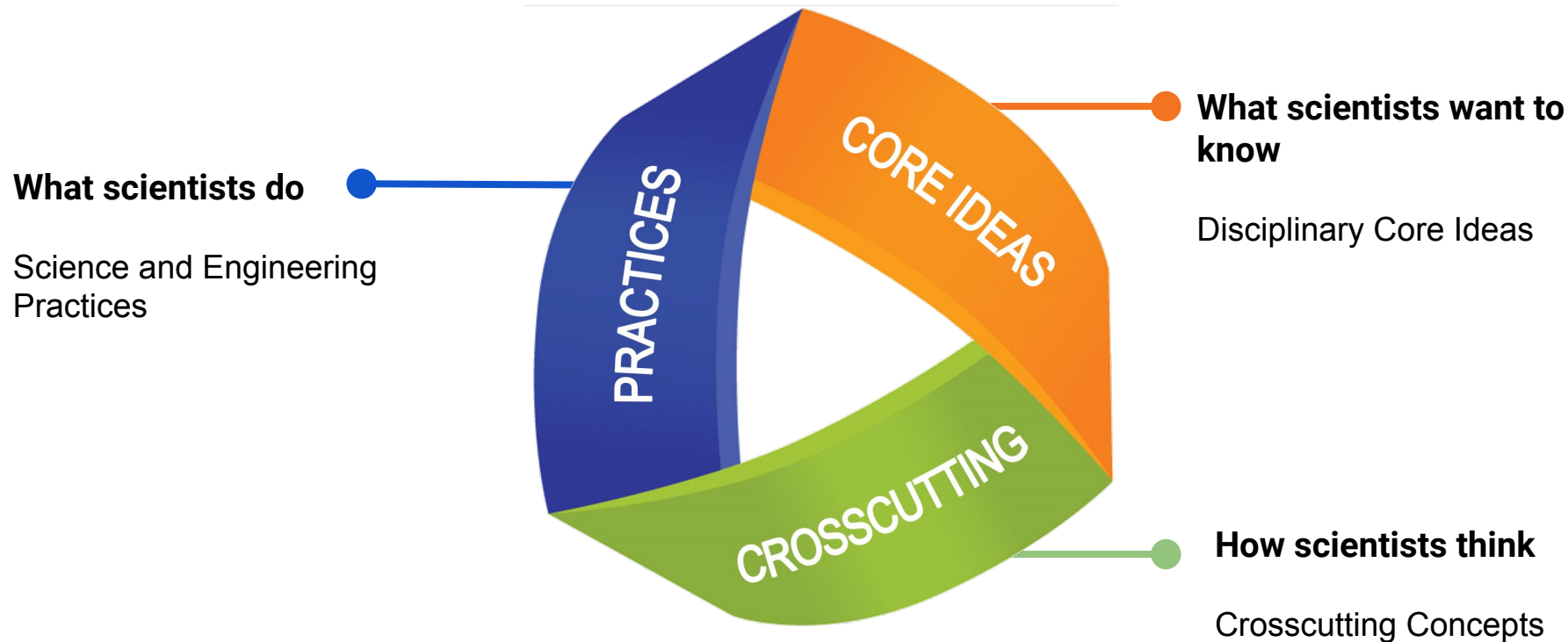
THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

+ Amplify.

Amplify Science

Next Generation Science Standards

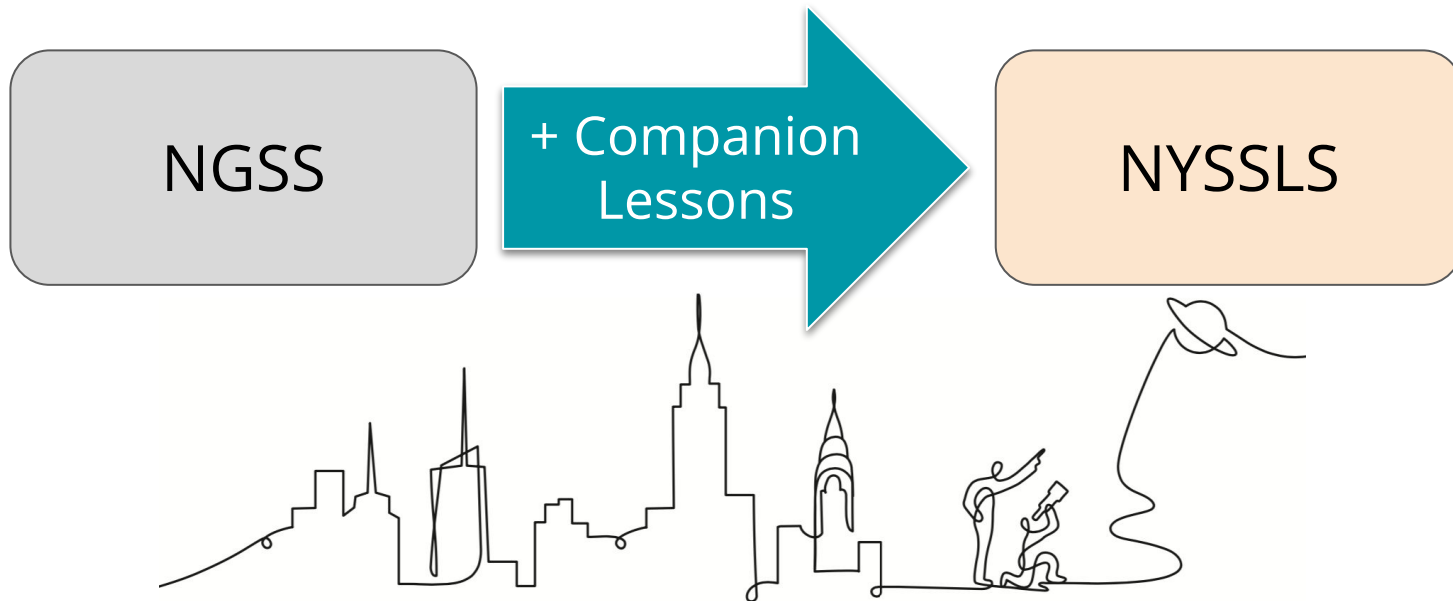
Designed to help students build a cohesive understanding of science



NYC Companions

Amplify Science

Amplify Science NYC Edition



NYC Companion Lesson Slides, Grade 8

<https://amplify.com/resources-page-for-nyc-6-8/>

Grade 8 lesson guides and copymaster

Magnetic Fields: Water Wheel Design



Slides for the Companion Lessons that go with the Magnetic Fields Unit will be available on the NYC Resources site before you get to the unit.

Middle School Units: **Launch; Core; Internship**



11 Lessons
Geology on Mars



19 Lessons
Plate Motion



10 Lessons
Plate Motion Engineering Internship

AmplifyScience

authored by  THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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Middle School Curriculum New York City Edition

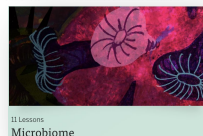
Grade 6

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



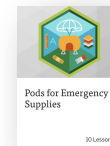
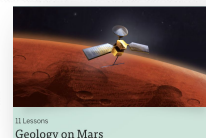
Grade 7






- 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

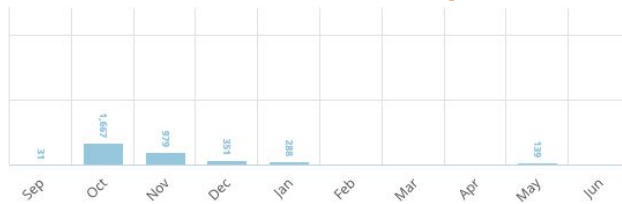


Sept.				Oct.				Nov.				Dec.				Jan.				Feb.				Mar.				Apr.				May				Jun.			
9/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/4	11/11	11/18	11/25	12/2	12/9	12/16	12/30	1/6	1/13	1/20	1/27	2/3	2/10	2/24		3/2	3/9	3/16	3/23	3/30	4/6	4/20	4/27	5/4	5/11	5/18	5/25	6/1	6/8	6/15	6/22
																																							
Launch Unit: Harnessing Human Energy				Thermal Energy				Populations and Resources				Matter and Energy in Ecosystems				Weather Patterns				Ocean, Atmosphere, and Climate				Earth's Changing Climate															
																																							
Launch Unit: Microbiome				Metabolism				Phase Change				Chemical Reactions				Plate Motion				Engineering Internship: Plate Motion				Rock Transformations				Engineering Internship: Earth's Changing Climate											
																																							
Launch Unit: 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							
9/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/4	11/11	11/18	11/25	12/2	12/9	12/16	12/30	1/6	1/13	1/20	1/27	2/3	2/10	2/24		3/2	3/9	3/16	3/23	3/30	4/6	4/20	4/27	5/4	5/11	5/18	5/25	6/1	6/8	6/15	6/22

8th Grade Overview: Scope and Sequence

Geology on Mars

Sept



Earth, Moon, and Sun

Oct



Force and Motion

Nov-Dec



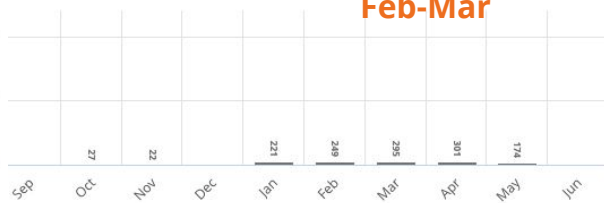
Magnetic Fields

Jan-Feb



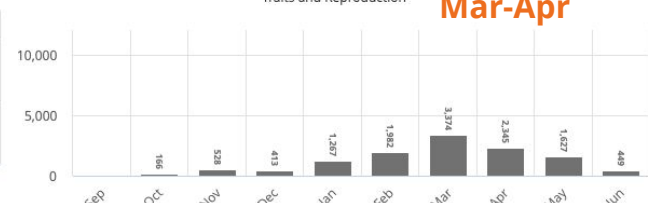
Light Waves

Feb-Mar



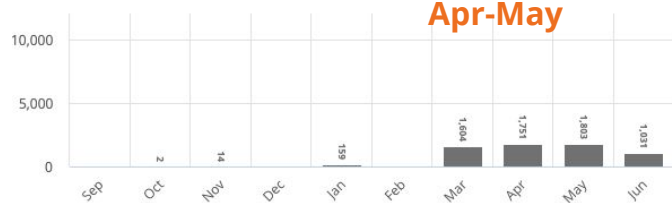
Traits and Reproduction

Mar-Apr



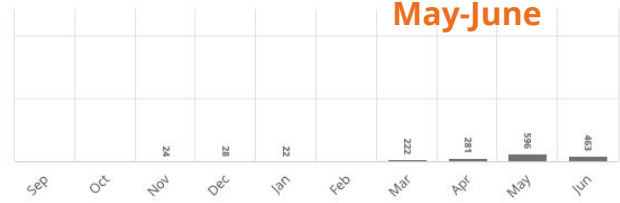
Natural Selection

Apr-May

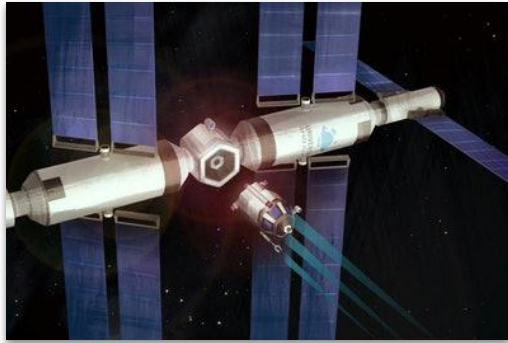


Evolutionary History

May-June



Unit at a Glance: Force and Motion



Force and Motion

16 lessons

45 minutes each

3 assessment days

Domain: Physical Science

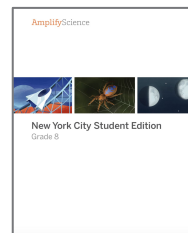
Unit type: Core

Student role:Physicists

Phenomenon: The asteroid sample-collecting pod failed to dock at the space station as planned.

Middle School Unit Resources

NYC Print student editions



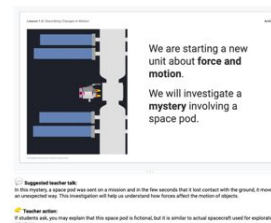
Investigation
Notebooks or digital
student experience



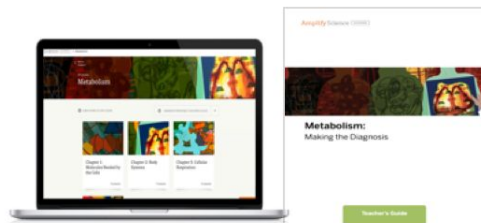
Articles
(digital or print)



Simulations and other
digital tools



Classroom Slides



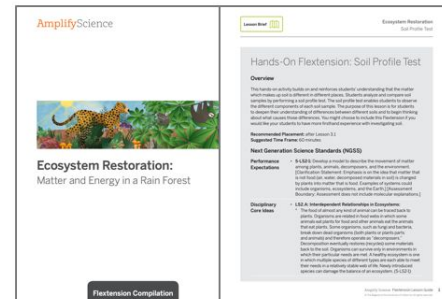
Teacher's Guide
(digital or print)

ACTIVITIES			LEVELS	
SUBMISSIONS	LAST SUBMISSION	FEEDBACK		
23/26	5:38 PM Wed. 10/2/23	0	3	>
23/26	5:00 PM Wed. 10/2/23	2 reading	3	>
23/26	6:57 PM Wed. 10/2/23	0	3	>
23/26	1:42 PM Thu. 10/2/23	0	3	>

Assessments and
Reporting



Hands-on and print
materials



Hands-on Flexensions

Classwork

UNIT	CHAPTER	LESSON	ACTIVITY TYPE	ACTIVITY	SUBMISSIONS	LAST SUBMISSION	FEEDBACK
Force and Motion	1 Force and Velocity	1 Pre... X 2 Des... X	All	Multiple Choice Lesson 1	26/26	5:38 PM Wed. 4/17/19	0
				Written-Response Question #1 Lesson 1	23/26	5:00 PM Wed. 4/17/19	2 awaiting
				Written-Response Question #2 Lesson 1	23/26	4:57 PM Wed. 4/17/19	0
				Warm-Up Lesson 2	23/26	1:42 PM Thu. 4/18/19	0

1. Which statement best describes what Earth's outer layer is like underneath the surface in the image?

a Underneath both the soil and the ocean, Earth's outer layer is made of sand and water.

b Underneath both the soil and the ocean, Earth's outer layer is made of hard, solid rock. ✓

c Underneath the soil, Earth's outer layer is made of hard, solid rock. Underneath the ocean, Earth's outer layer is made of sand.

d Hard-working

65% of students answered correctly.

2. Dr. Robie and her team of geologists have been studying GPS data that shows that two plates moved apart. Which diagram shows what happened between the two plates as they moved away from each other?

a Diagram A: A new plate from underneath filled in the gap that was created by the plates moving apart.

b Diagram B: Sand and dirt filled in the gap that was created by the plates moving apart.

c Diagram C: Ocean water filled in the gap that was created by the plates moving apart.

d Diagram D: Soft, solid rock from underneath the plate's rose and hardened, adding solid rock to the edges of both plates.

87% of students answered correctly.

Annotations: "Easily advance to the next student" points to the 'Next' button. "Use the feedback panel to input rubric scores, comments, and award badges" points to the feedback panel. "Easily reference the total number of students who answered an automatically graded question correctly" points to the percentage of correct answers.

Written Response #1

A team of geologists learned from GPS data that two continents that have an ocean between them are moving toward each other. Diego's little brother hears this and cannot believe that continents can move and is worried that those two continents are going to run into each other. How would you explain to him what is happening?

I would tell Diego's little brother that he doesn't have to worry about the two continents moving towards each other because **plate motion is a gradual process** that takes place over a very long period of time. Plate collisions don't happen suddenly. **The rate of plate motion is so slow that the geologists discovered is probably an extremely small amount and Diego would be able to detect that tiny change.**

Word Count: 70

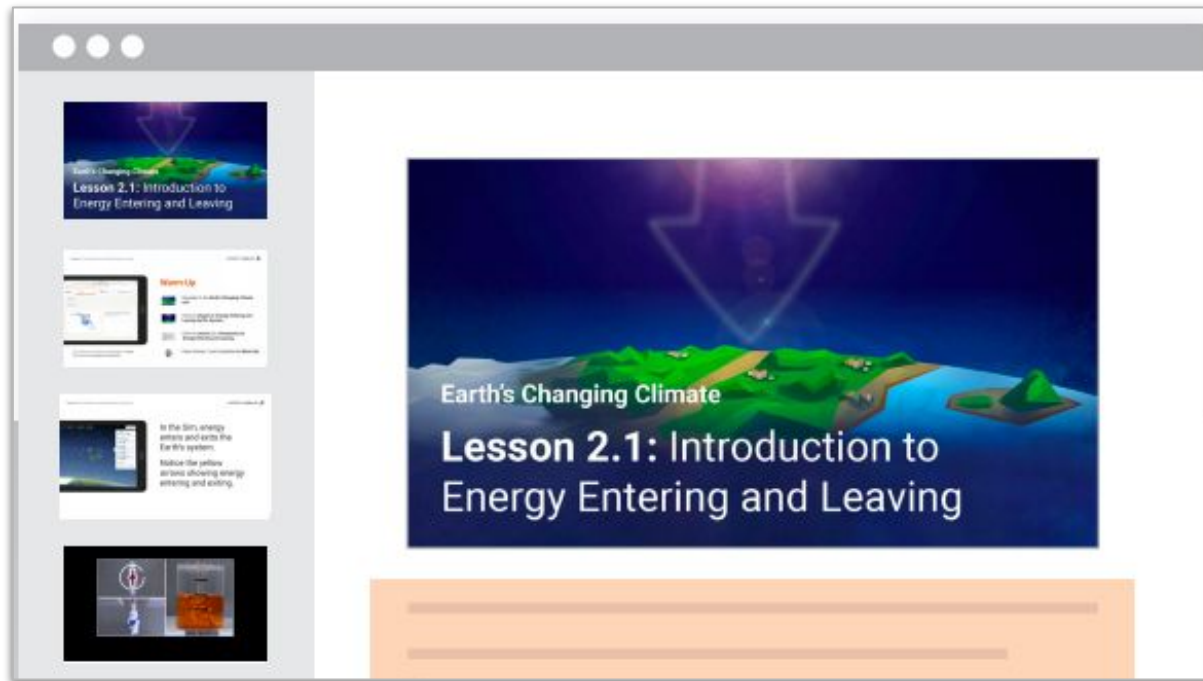
Written Response #2

Annotations: "Include emoji" points to a fire emoji in the feedback comment: "Keep up the good work! 🔥🔥🔥".

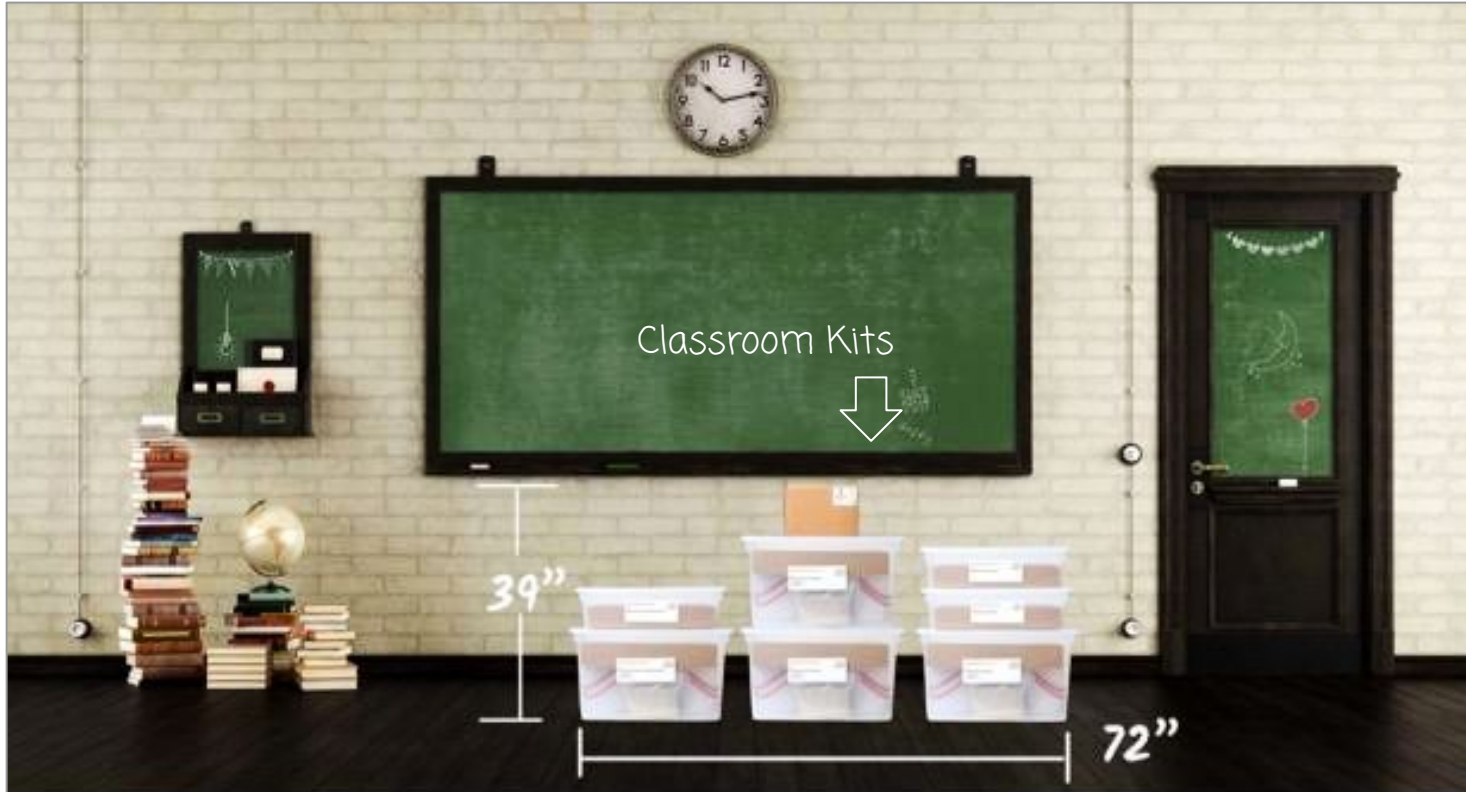
Coming Soon for Back to School!

Classroom Slides

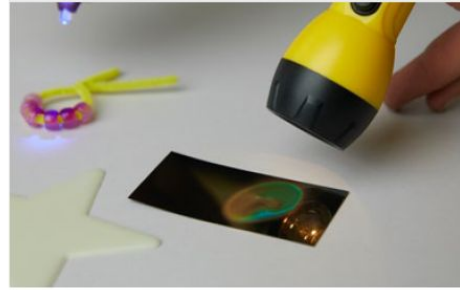
Each lesson will have a downloadable and editable PowerPoint file to help guide teachers and their students through the lesson.



Classroom Kits



Hands On Learning Materials



Force and Motion Classroom Wall

Unit Question

How do forces affect motion?

Chapter 1 Question

What caused the pod to change direction?

Key Concepts

1. A force is required to change the velocity of an object.

Vocabulary

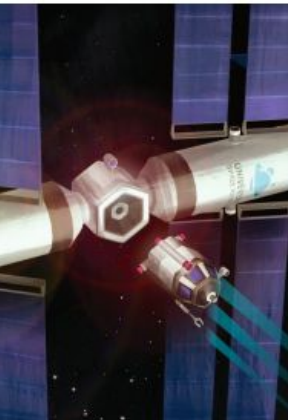
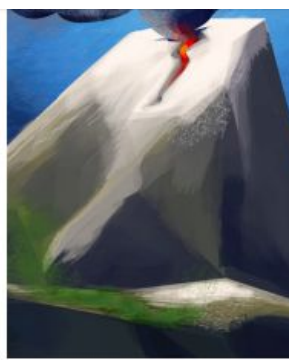
velocity



Ask in the chat feature



Questions?



Plan for the day

✓ What is Amplify Science?

● Navigation essentials

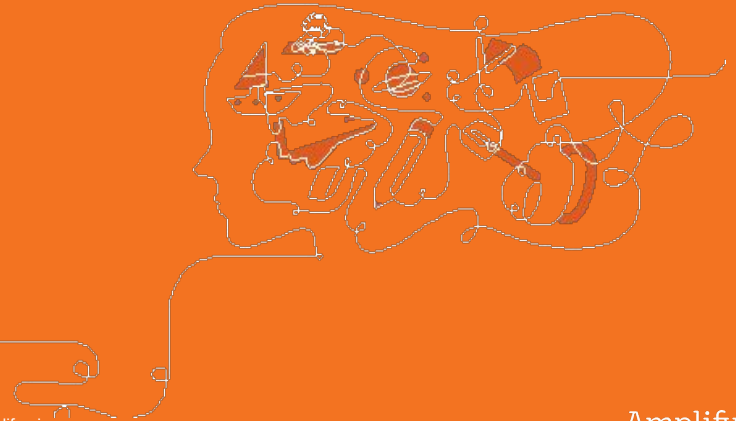
● Teaching a phenomenon-based lesson

● Unit Guide Resources


● Assessments

● Closing and Reflection

Navigation Essentials

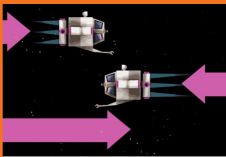


Unit




19 Lessons
Force and Motion

Chapters



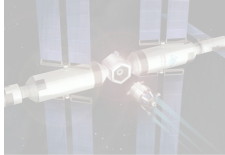
Chapter 1: Force and Velocity

6 Lessons




Chapter 2: Mass and Velocity

5 Lessons



Chapter 3: Collisions

4 Lessons



Chapter 4: Force, Motion, and Movie Sets

4 Lessons

Lessons

Lesson 1.1:
Pre-Unit Assessment

Lesson 1.2:
Describing Changes in Motion

Lesson 1.3:
Investigating Direction of Force

Lesson 1.4:
Explaining Force and Velocity

Lesson 1.5:
Force Strength and Velocity Change

Lesson 1.6:
Evaluating Claims and Thruster Forces

Activities

Lesson Brief (4 Activities) < 1 WARM-UP Warm-Up 2 STUDENT-TO-STUDENT DISCUSSION Word Relationships 3 HANDS-ON Investigating Strong and Weak Forces 4 HOMEWORK Homework >

3 Steps for Preparing to Teach

Step 1:

Read the lesson overview

Step 2:

Read the Materials and Preparation section

Step 3:

Read the Differentiation

Lesson 1.2:
Describing Changes in
Motion

T TEACHER
The Missing Seconds Video

2 STUDENT-TO-STUDENT
DISCUSSION
Discussing What Happened
to the Pod

3 HANDS-ON
Exploring Changes in
Motion

4 STUDENT-TO-ST
DISCUSSION
Discussing Chang
Motion

RESET LESSON

GENERATE PRINTABLE LESSON GUIDE

Lesson Brief

Overview

Materials & Preparation

Differentiation

Standards

Digital Resources

Classroom Slides 1.2 | PowerPoint

All Projections

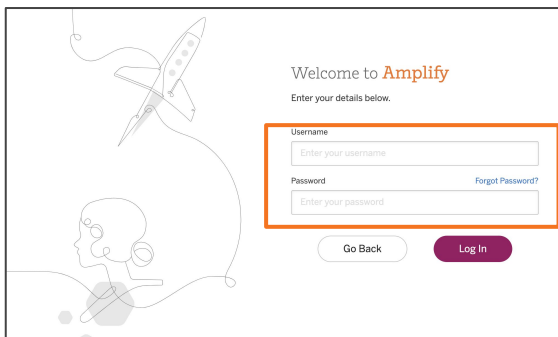
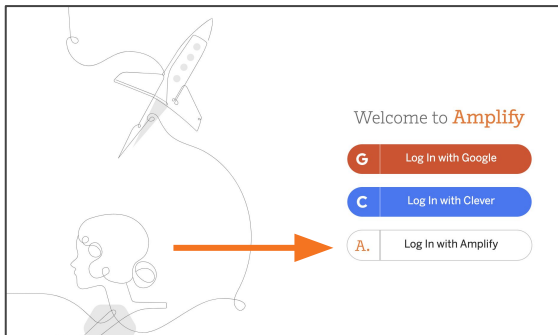
Video: Missing Seconds

Launcher Setup Instructions

Missing Seconds Storyboard

Welcome to Amplify Science!

Do Now: Login



1. Go to **learning.amplify.com**
2. Select **Log in with Amplify**
3. Enter teacher demo account credentials

- **xxxxxxx@pd.tryamplify.net**
- **Password: xxxx**

4. Explore as we wait to begin

Lesson Level Exploration

Scavenger Hunt

Lesson-level scavenger hunt

Goals:

- Practice navigating at the lesson level and deepen your understanding of the student role and anchor phenomenon in your unit.

PART 1: Lesson 1.1.

Task	Notes
Navigate to Lesson 1.1 in your Launch unit. Scroll down to the Lesson Brief and scroll/click to view the Overview. Skim the section then answer the following questions:	
What is the purpose of this lesson?	
How many activities are in the lesson?	
How long is the activity that introduces the students to the role they'll play in the unit? <ul style="list-style-type: none">Microbiome: Activity 1<ul style="list-style-type: none">Harnessing Human Energy: Teacher-only activity between activities 1 and 2.Geology on Mars: Teacher-only activity between activities 3 and 4.	

Task	Notes
Scroll/click to view Materials & Preparation.	
List the materials you'll need for this lesson.	
Describe one step of preparation you will need to do before this lesson, between classes, and at the end of the day.	

8 Grade 6-8
Navigating Program Essentials

6-8 Lesson-level scavenger hunt cont.

Task	Notes
Scroll up to the Lesson Map. Select the activity in which the student role is introduced. [Tip: Use the arrow at the end of the lesson map to reveal all activities.] Read the steps for teaching the activity listed in the Step-by-Step to gain a better understanding of the activity.	
What is the student role and how is it introduced?	

Task	Notes
Try the following navigation features: <ul style="list-style-type: none">Click on the Instructional Guide icon to see the student view of the lesson, and click on it again to toggle back to the teacher instructions.Click Next Activity or Next at the bottom to read the next activity in the lesson.	
What additional resources can you find on each page of the guide—what links, tabs, and other supports do you notice?	

PART 2: Introduction of the anchor phenomenon or design problem

Task	Notes
Use the breadcrumb (Unit-Chapter-Lesson) trail (top left) to navigate to the lesson and activity in which the anchor phenomenon is introduced. <ul style="list-style-type: none">Microbiome: Lesson 2.2: Teacher-only activity video message and Activity 3 message from the Microbiome Research InstituteGeology on Mars Lesson 1.2, Activity 3. (be sure to click NEXT at the bottom)Harnessing Human Energy: Lesson 1.1: Teacher-only activity video message (introduces both the student role and the design problem)	
How is the design problem or anchor phenomenon introduced to students? What ideas or questions do you think students will have about the problem they're asked to solve?	

9



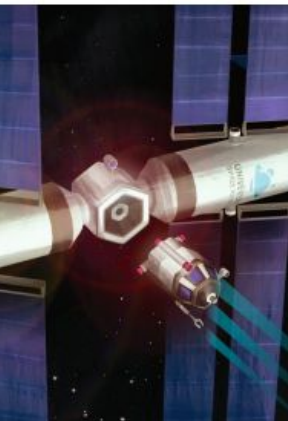
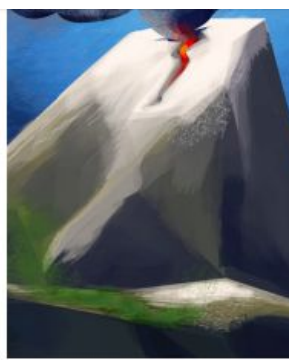
Ask in the chat feature



Questions?

5 min break





Plan for the day

✓ What is Amplify Science?

✓ Navigation essentials

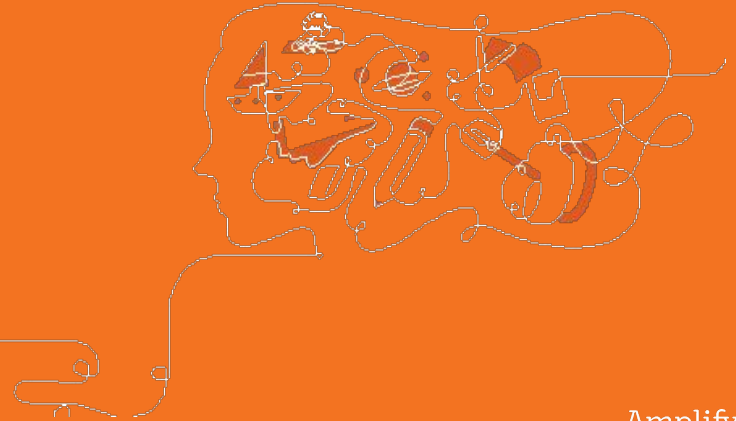
● Teaching a phenomenon-based lesson

● Unit Guide Resources

● Assessments

● Closing and Reflection

What is phenomenon-based instruction?



Next Generation Science Standards

Phenomenon-based teaching and learning

A scientific phenomenon is an **observable event** that occurs in the universe that we can use science ideas to explain or predict.



Next Generation Science Standards

Think-Type-Discuss: How might learning be different?

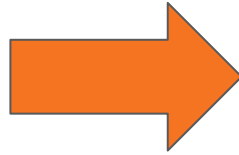
Topic-based	Phenomenon-based
What is the water cycle?	What caused the storms in this area to be severe?
What is an ecosystem?	Why are there suddenly so many moon jellies?
How does light energy interact with matter?	Why does Australia have an elevated skin cancer rate?

Comparing topics and phenomena

A shift in science instruction

from learning about

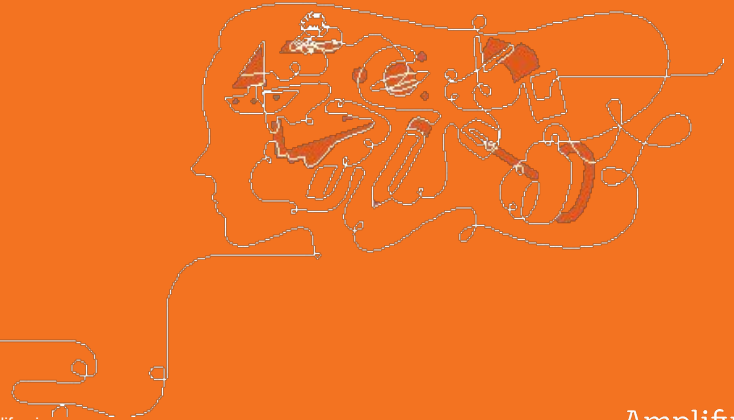
(like a student)



to figuring out

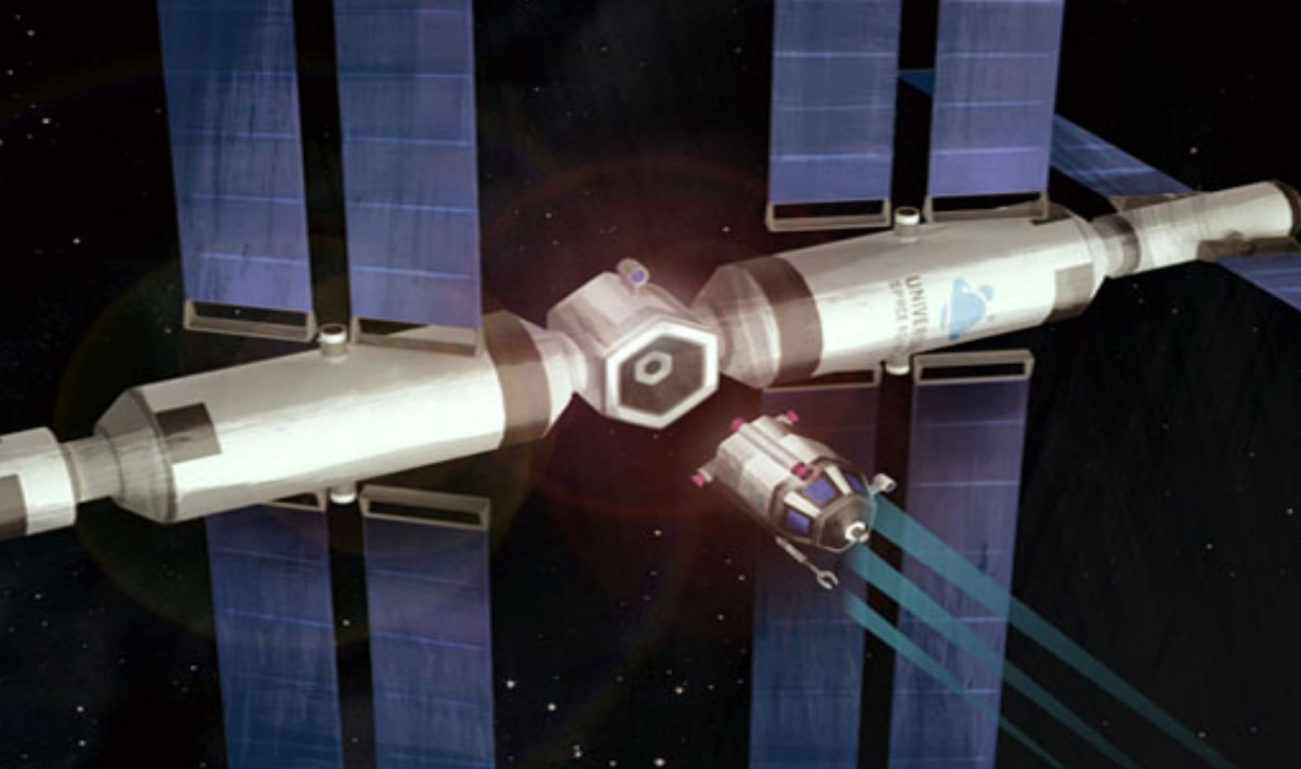
(like a scientist)

Teaching a phenomenon-based lesson



Force and Motion Instructional Sequence



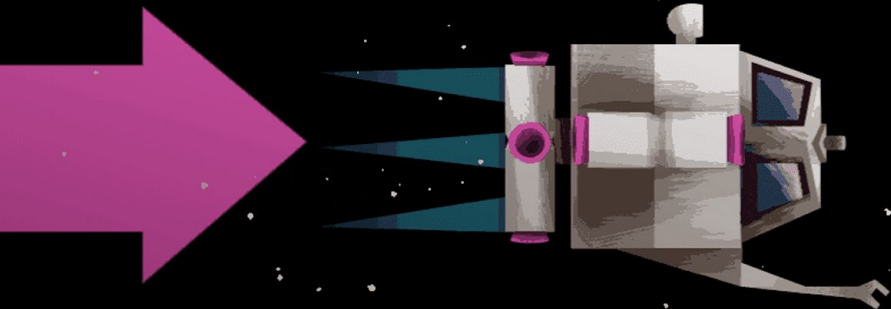


I'm a Physicist.



Anchor Phenomenon: Rather than stopping and docking at the space station, the asteroid sample-collecting pod moved in the opposite direction.

Student Role: Student Physicists

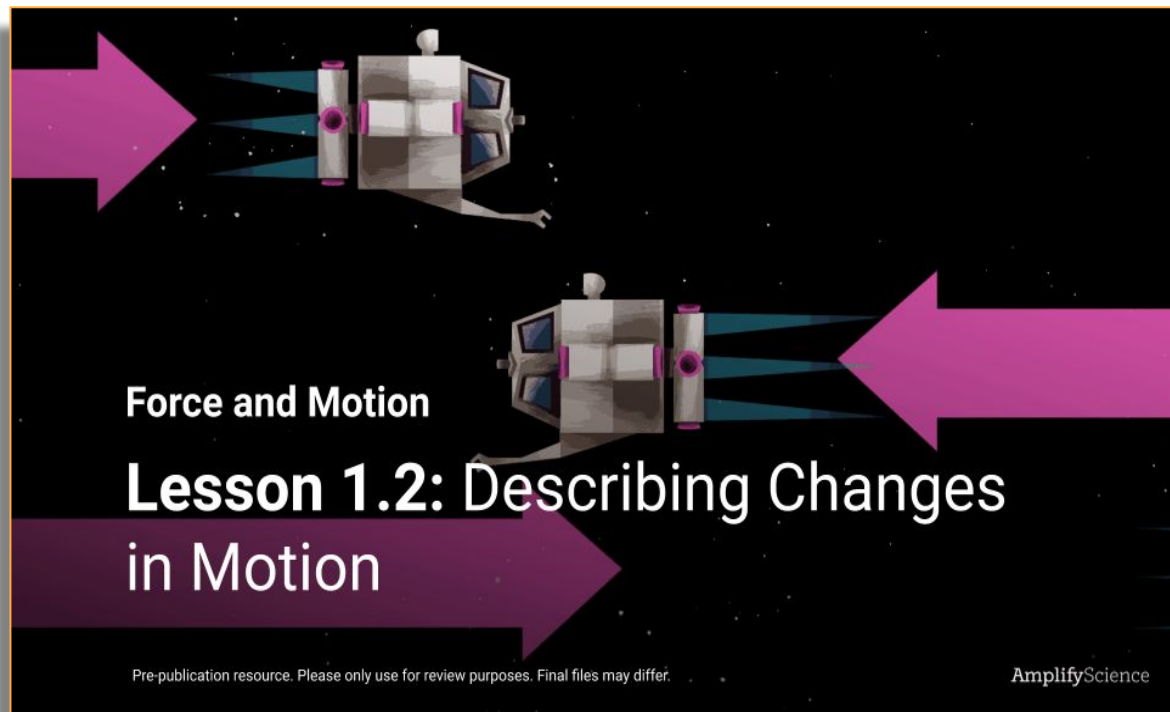


Force and Motion

Lesson 1.2: Describing Changes in Motion



Classroom Slides



👉 Teacher action:

Read the two claims out loud and give pairs a few minutes to discuss the claims. Point out that students may want to compare the claims storyboard with the storyboard showing the expected outcome. If time allows, invite a few students to share their ideas about the claims with the class.

🧠 Students may respond:

- In Claim 1, the thrusters cause the pod to move in the opposite direction; in Claim 2, the thrusters slow the pod down, but it's not enough, so it collides with the space station.
- (Accept all responses.)

Force and Motion

Lesson 1.2: Describing Changes in Motion

Activity 1 Warm-Up

Lesson 1.2 Describing Changes in Motion

We will start with a Warm-Up each day to get us thinking about science ideas.

Complete the Warm-Up by writing your answers to the questions.

Activity 2 Discussing What Happened to the Pod

Lesson 1.2 Describing Changes in Motion

We are starting a new unit about **force and motion**.

We will investigate a **mystery** involving a space pod.

Unit Question

How do forces affect motion?

Lesson 1.2 Describing Changes in Motion

Why do you think the pod moved in the opposite direction instead of stopping like it was supposed to?

Let's watch a **video** about the space pod mystery. As you watch, think about **this question**. You will discuss it when the video is over.

Lesson 1.2 Describing Changes in Motion

Why do you think the pod moved in the opposite direction instead of stopping like it was supposed to?

Discuss your ideas about the reflection question.

Lesson 1.2 Describing Changes in Motion

Asteroid Collection Missions

Pod operations: asteroid capture or asteroid impact?

Thrusters fire to stop the pod.

Thrusters used incorrectly led to space station.

Here's what is usually supposed to happen during asteroid collection missions. In this mission, everything was supposed to be the same.

Lesson 1.2 Describing Changes in Motion

The **thrusters**, or small engines, were supposed to fire and stop the pod as it reached the space station so it could dock. Instead, this pod moved in the **opposite direction**.

Lesson 1.2 Describing Changes in Motion

These claims are different explanations for what happened to the pod.

How are the two claims different?

Which claim makes the most sense to you?

Activity 3 Exploring Changes in Motion

Chapter 1 Question

What caused the pod to change direction?

Lesson 1.2 Describing Changes in Motion

In this activity, to understand why the pod changed direction, we will **investigate** how the motion of an object can change and what causes these changes to happen.

Lesson 1.2 Describing Changes in Motion

This **spring launcher** is one tool that we will use in our investigations. Today, make sure **NOT** to push the launcher beyond the 1 mark.

Lesson 1.2 Describing Changes in Motion

You can use this **diagram** to remember how the spring launcher works. Notice that the narrow end of the launcher needs to be touching the object you are launching.

Lesson 1.2 Describing Changes in Motion

Let's read the **directions** for the investigation. You can use the launcher to cause the objects to move, but you can also think of **other ways** to change their motion.

Lesson 1.2 Describing Changes in Motion

These are the **materials** you can use. Remember that you are working with laboratory equipment, and it should stay within your work area.

Lesson 1.2 Describing Changes in Motion

Use the materials to test out **different ways** that the **motion of an object can change**. Record your notes in the **data table**.

Activity 4 Discussing Changes in Motion

Lesson 1.2 Describing Changes in Motion

Now, you will work together to summarize your results. Discuss and record the **five ways** that an object's motion can change.

Lesson 1.2 Describing Changes in Motion

Let's summarize the results as a class. What are the **five ways** that **motion can change**?

Vocabulary

velocity

speed in a particular direction

Lesson 1.2 Describing Changes in Motion

When physicists talk about motion, they have to agree on how to describe it. Direction is important when describing an object's motion, but you also need to agree on what is called the **frame of reference**. To understand this, let's consider an example.

Lesson 1.2 Describing Changes in Motion

If I hold a pencil as I walk around, from my **frame of reference**, the pencil is not moving. But from your frame of reference, the pencil is moving.

Lesson 1.2 Describing Changes in Motion

Physicists also agree on the **units** they are using. The units for velocity help describe how fast the object is moving. Throughout the unit, we will use centimeters as our measure for distance, and **centimeters per second** as the units for velocity.

Lesson 1.2 Describing Changes in Motion

Other units can be used to measure velocity as long as you describe the units. Can you think of other examples of units that could describe **velocity**?

Lesson 1.2 Describing Changes in Motion

- 1.
- 2.
- 3.
- 4.
- 5.

We identified **five ways** that motion can change. Remember that a change in motion is the same thing as a **change in velocity**.

Activity 5 Homework

Lesson 1.2 Describing Changes in Motion

For homework, create a **model** to show your ideas about what happened to the pod.

End of Lesson



Force and Motion

**Lesson 1.3: Investigating
Direction of Force**



Activity 1

Warm-Up





Warm-Up

Signifying Changes in Motion

1. Look carefully at the pair of images and think about what the arrows mean.

- Which image (A or B) shows the direction someone would need to kick the ball in order to move it toward the goal?

Activity 2

Exploring the Force and Motion Sim



Name: _____ Date: _____

Homework: Creating a Model to Explain What Happened to the Pod

Today you watched a video about a space pod that was trying to dock, but something happened to cause the pod to move away from the space station instead. Scientists don't know what caused this change in direction, because a few seconds of the video went out just as the pod was about to dock. **Create a model to explain what you think happened during the missing seconds that caused the pod to move away from the space station, in the opposite direction.** To create your model you may want to do one of the following:

- Use objects you have at home to show what you think happened. If you do this, bring these objects into class and be prepared to explain what you think happened.
- Create a diagram-model to show what you think happened. Be prepared to explain your diagram to other students.
- Find another way to model your thinking. Be prepared to share your model in class.

1. Describe what you did to create your model:

2. What are two ways your model accurately shows your ideas on what happened to the pod?

3. What are two ways your model does not accurately show your ideas on what happened to the pod?

Force and Motion—Lesson 1.2—Activity 5

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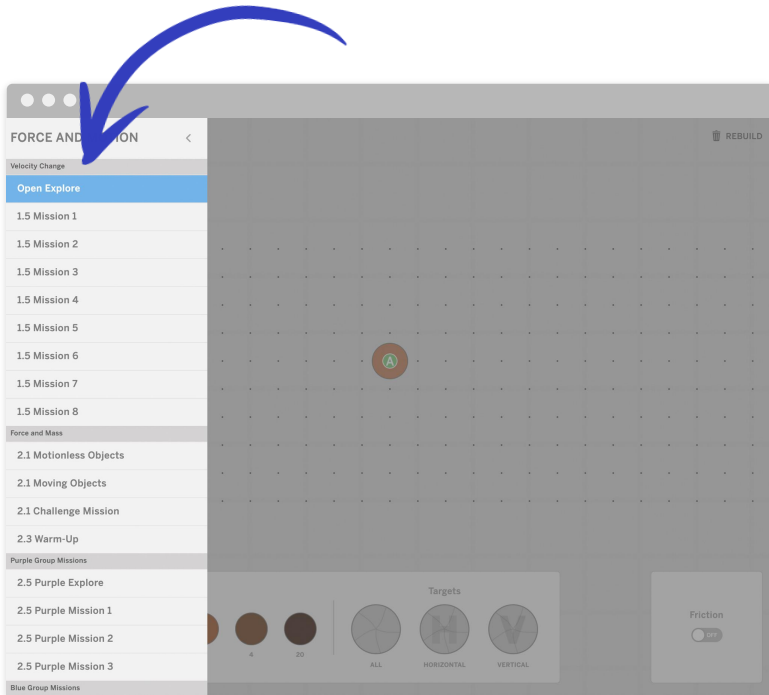
Let's discuss the models you created after the last lesson.



Use your model to **explain** your thinking about what happened to the pod.

Today, we will investigate this question:

Investigation Question:
What makes an object's motion change?



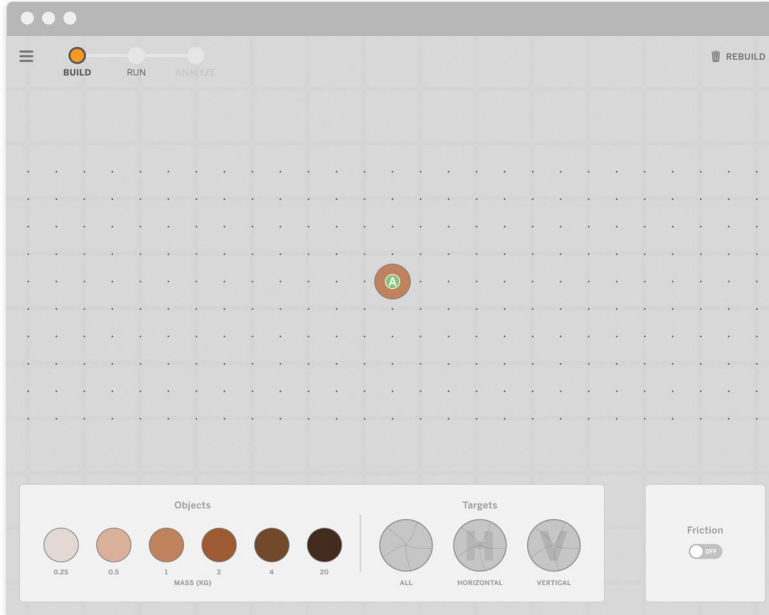
You will gather evidence about how the motion of objects can change using the ***Force and Motion Simulation***.

You'll start by selecting Open Explore mode.

Exploring the Force and Motion Sim

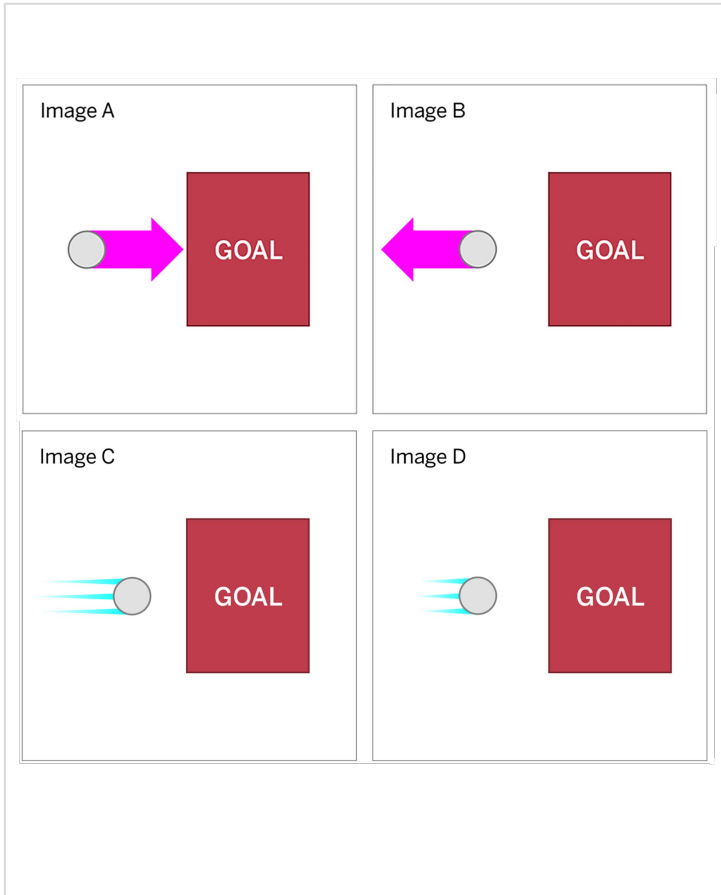
Exploring the Simulation

Explore the *Force and Motion* Simulation: [Open Explore mode](#). As you explore, share your discoveries with your partner.



What did you observe about the **Sim's features?**

The image shows a physics simulation interface. At the top left, there are three window control buttons. Below them is a progress bar with three stages: **BUILD** (indicated by an orange dot), **RUN** (indicated by a white dot), and **ANALYZE** (indicated by a white dot). On the top right, there is a **REBUILD** button with a trash icon. The main area is a grid with a single orange ball labeled 'A' in the center. At the bottom, there are three control panels. The first panel, titled **Objects**, shows six circles of increasing size and color, labeled with masses: 0.25, 0.5, 1, 2, 4, and 20. The second panel, titled **Targets**, shows three circular icons: **ALL**, **HORIZONTAL**, and **VERTICAL**. The third panel, titled **Friction**, has a toggle switch currently set to **OFF**.

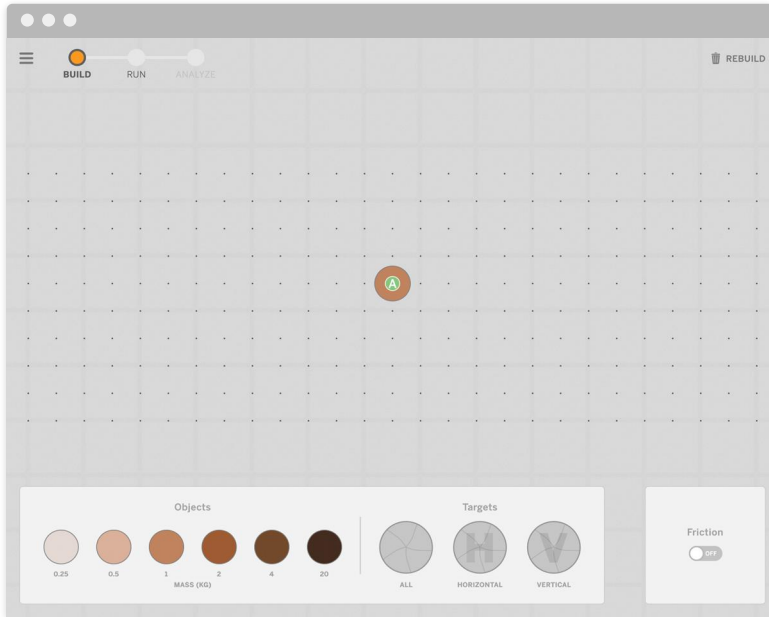


Notice that the **arrows** and **velocity tails** in the Sim are similar to the ones we saw in our Warm-Up today.

Activity 3

Gathering Evidence About Velocity Changes

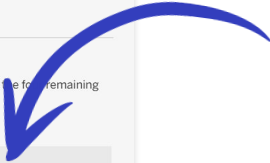




Next, we'll use the Sim to explore the **ways an object's velocity can change**. I'll demonstrate one way by making an object **start moving**, and then you'll explore the other ways in groups.

Gathering Evidence About Velocity Changes

1. Use the [Force and Motion Simulation](#) to discover what you need to do to change an object's velocity.
2. Your teacher will demonstrate the first change, and then each member of your group will explore one of the remaining changes.



Object's velocity change	How you made this change
1. start moving	<input type="text"/>
2. speed up	<input type="text"/>
3. slow down	<input type="text"/>
4. stop moving	<input type="text"/>
5. move in opposite direction	<input type="text"/>

As you gather evidence about what you need to do to change an object's velocity, you'll **record your answers** in this table.

The screenshot shows a physics simulation interface. At the top, there are three window control buttons (red, yellow, green) on the left. Below them is a menu icon (three horizontal lines) and a progress indicator with three circles. The first circle is orange and labeled "BUILD", the second is white and labeled "RUN", and the third is white and labeled "ANALYZE". On the right side of the top bar is a trash can icon and the text "REBUILD".

The main area is a large grid of dots. A single object, a brown circle with a green letter "A" inside, is positioned in the center of the grid.

At the bottom, there are three control panels:

- Objects:** A row of six circles of increasing size and darkness, labeled with their masses: 0.25, 0.5, 1, 2, 4, and 20. Below the circles is the text "MASS (KG)".
- Targets:** Three circular icons. The first is labeled "ALL" and shows a circle divided into six segments. The second is labeled "HORIZONTAL" and shows a circle with a horizontal line and the letter "H". The third is labeled "VERTICAL" and shows a circle with a vertical line and the letter "V".
- Friction:** A toggle switch labeled "OFF".

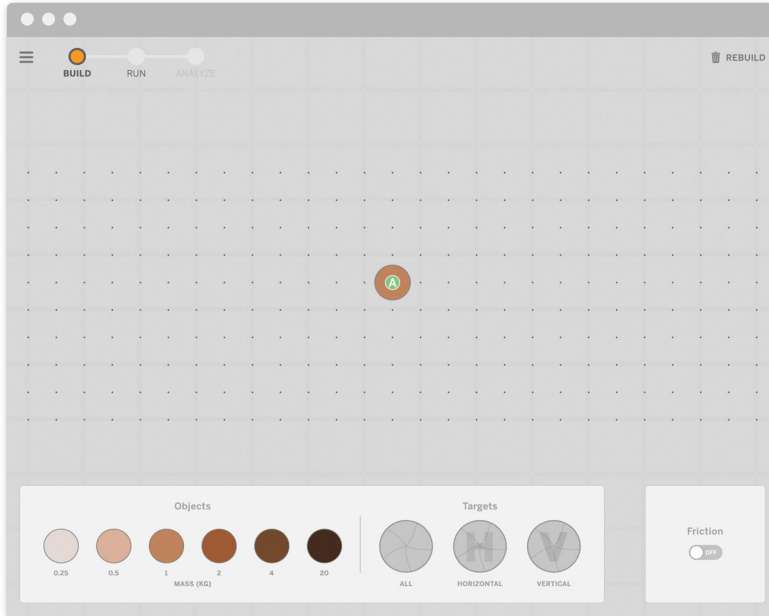
Gathering Evidence About Velocity Changes

1. Use the [Force and Motion Simulation](#) to discover what you need to do to change an object's velocity.
2. Your teacher will demonstrate the first change, and then each member of your group will explore one of the four remaining changes.

Object's velocity change	How you made this change
1. start moving	<input type="text" value="hit or push in any direction"/>
2. speed up	<input type="text"/>
3. slow down	<input type="text"/>
4. stop moving	<input type="text"/>
5. move in opposite direction	<input type="text"/>

To make an object **start moving**, we can push it or make another object run into it. This can happen in any direction.

In Row 1, I'd write, "hit or push in any direction."



You will work in groups of four, and each person will **explore** one of the remaining ways an object's velocity can change. You'll **share** what you discover with your group.



Gathering Evidence About Velocity Changes

1. Use the [Force and Motion Simulation](#) to discover what you need to do to change an object's velocity.
2. Your teacher will demonstrate the first change, and then each member of your group will explore one of the four remaining changes.

Object's velocity change	How you made this change
1. start moving	<input type="text"/>
2. speed up	<input type="text"/>
3. slow down	<input type="text"/>



Gathering Evidence About Velocity Changes

1. Use the [Force and Motion Simulation](#) to discover what you need to do to change an object's velocity.
2. Your teacher will demonstrate the first change, and then each member of your group will explore one of the four remaining changes.

Object's velocity change	How you made this change
1. start moving	hit or push in any direction
2. speed up	<input type="text"/>
3. slow down	<input type="text"/>
4. stop moving	<input type="text"/>
5. move in opposite direction	<input type="text"/>

Each group member will now share and demonstrate their velocity change.



Share what you did to make your velocity change happen, as the rest of the group listens and records.

Gathering Evidence About Velocity Changes

1. Use the [Force and Motion Simulation](#) to discover what you need to do to change an object's velocity.
2. Your teacher will demonstrate the first change, and then each member of your group will explore one of the four remaining changes.

Object's velocity change	How you made this change
1. start moving	hit or push in any direction
2. speed up	<input type="text"/>
3. slow down	<input type="text"/>
4. stop moving	<input type="text"/>
5. move in opposite direction	<input type="text"/>



Let's discuss how we used the Sim to change an object's velocity and **think about the words** that can describe what we did.

Vocabulary



force

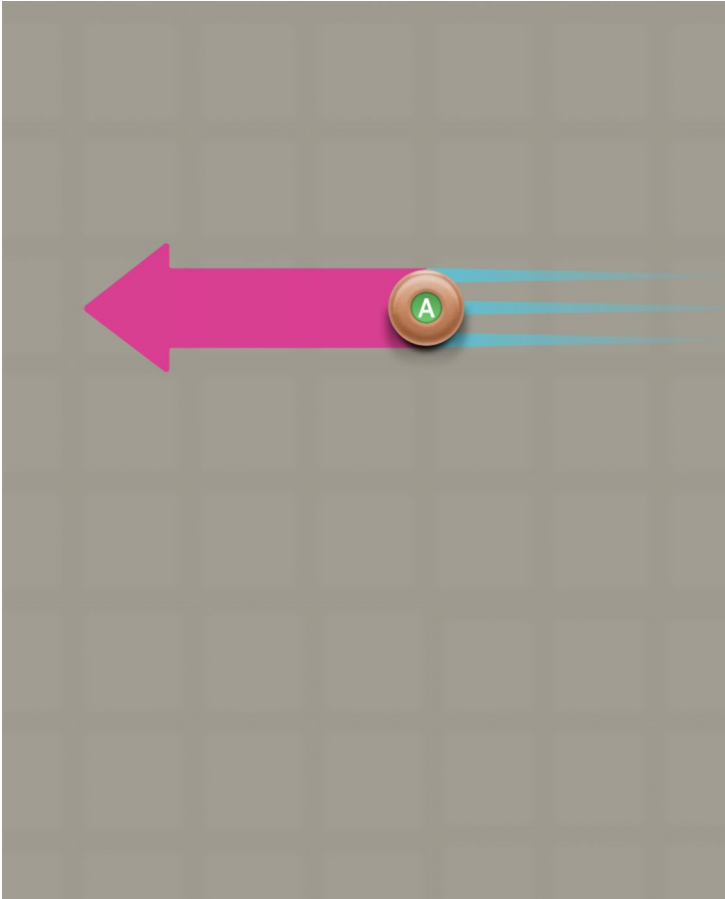
a push or a pull that can change the motion of an object

Vocabulary



exert

to apply a force

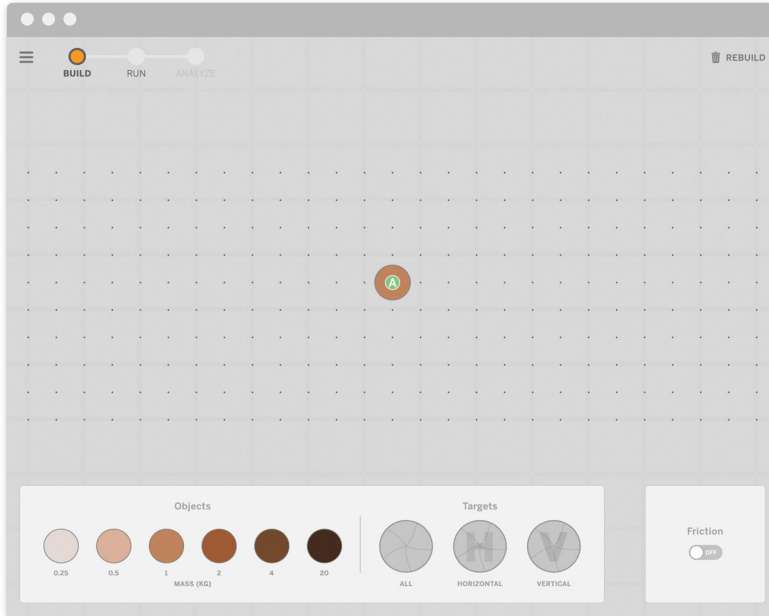


To cause each of the velocity changes, you had to **exert a force**.

This leads to our first **key concept**.

Key Concept

1. A force is required to change the velocity of an object.



In the next Sim activity, you will determine **in which direction** a force must be exerted to cause each of the ways an object's velocity can change.

Gathering Evidence About Velocity Changes

Gathering More Evidence About Velocity

1. Use the *Force and Motion Simulation* to determine how to exert a force to cause an object's velocity to change in each of the five ways.
2. Predict the direction a force must be exerted. Use one of these options:
 - **same** direction as object's motion
 - **opposite** direction as object's motion
 - **any** direction
3. With your partner, test your predictions and record the results in the third column.
4. Discuss the Investigation Question with your partner: *What makes an object's motion change?*

Object's velocity change	Direction of force (predicted)	Direction of force (actual)
1. start moving		
2. speed up		
3. slow down		
4. stop moving		
5. move in opposite direction		



Before you investigate, **record your predictions** about what you think will happen. Then, **share your predictions** with your partners.

Gathering Evidence About Velocity Changes

Gathering More Evidence About Velocity

1. Use the *Force and Motion Simulation* to determine how to exert a force to cause an object's velocity to change in each of the five ways.
2. Predict the direction a force must be exerted. Use one of these options:
 - **same** direction as object's motion
 - **opposite** direction as object's motion
 - **any** direction
3. With your partner, test your predictions and record the results in the third column.
4. Discuss the Investigation Question with your partner: *What makes an object's motion change?*

Object's velocity change	Direction of force (predicted)	Direction of force (actual)
1. start moving		
2. speed up		
3. slow down		
4. stop moving		
5. move in opposite direction		

Now it's time to test your predictions.



Complete your tests and record the results. Then, discuss your answers to the Investigation Question.

Now that we've explored five different ways that velocity can change, let's share our ideas about the question we've been investigating.



What makes an object's motion change?

Key Concept

2. How an object changes velocity depends on the direction of the force exerted on that object.

Vocabulary



cause

an event or process that leads to a result or change

Vocabulary



effect

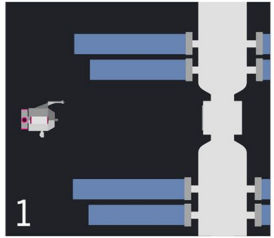
a result or change that happens because of an event or process

Activity 4

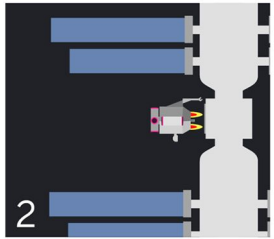
How the Pod Changed Its Velocity



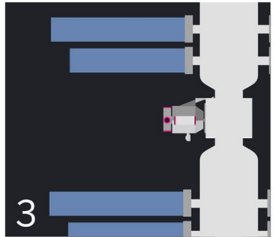
Asteroid Collection Missions



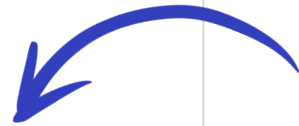
Pod approaches space station at medium speed.



Thrusters fire to stop the pod.



Docking: pod connects to space station.



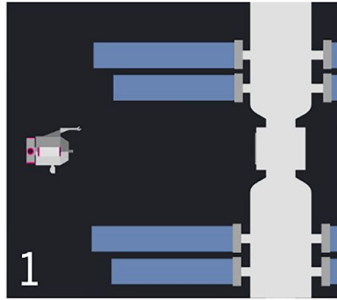
Remember, this is what was supposed to happen during the pod mission.



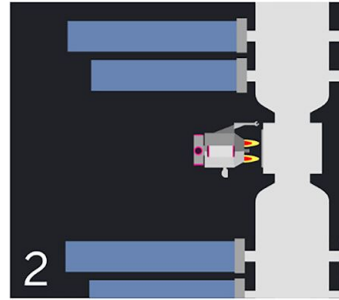
Think about **in which direction the thrusters need to fire** in order to exert a force that would cause the pod to stop.



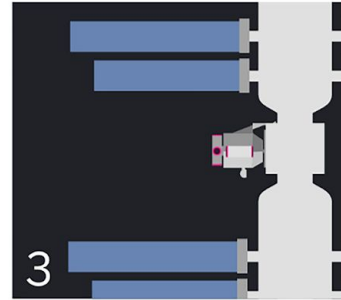
How the Pod Changed Its Velocity



Pod approaches space station at medium speed.

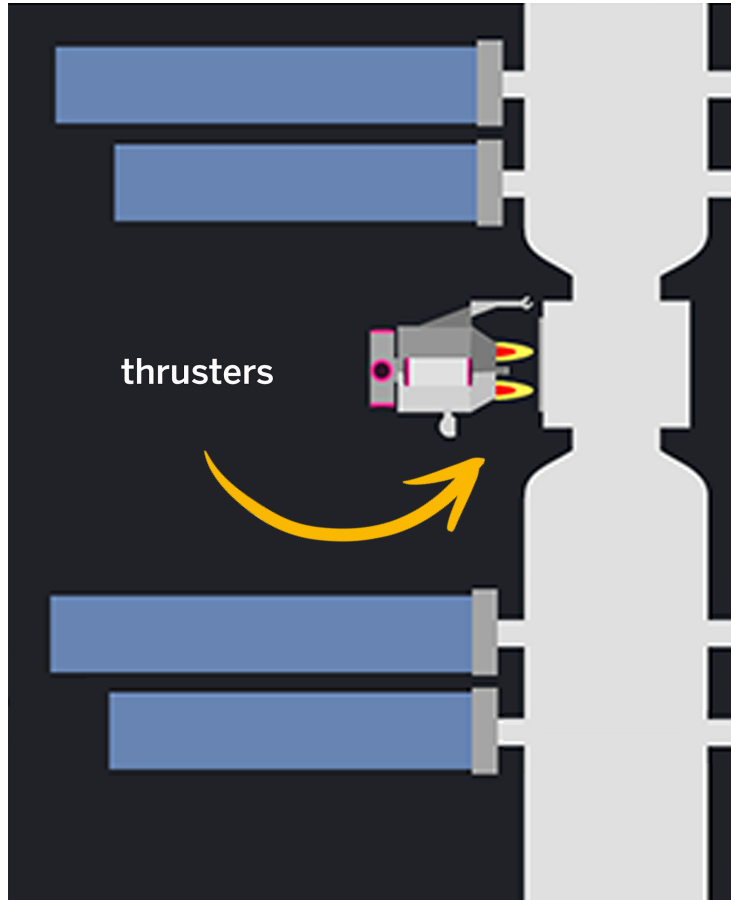


Thrusters fire to stop the pod.



Docking: pod connects to space station.

The thrusters fire to exert a force in the as the motion of the pod, and that causes it to stop.



In the pod mission, the thrusters fired in the **opposite direction** of the pod's motion, but the change in velocity was not what the USA team expected. We'll continue to investigate why.

Activity 5

Homework



The screenshot shows a web-based sorting tool interface. At the top, there are three window control buttons (red, yellow, green) and a navigation bar with a menu icon, a 'Hand in' button, an 'Instructions' button, and 'Reset', 'Undo', and 'Redo' buttons. The main area is titled 'Sort the cards to show in which direction a force was exerted.' Below this title are two large grey rectangular boxes. The left box contains the text 'CAUSE: Object Pushed in Same Direction as Its Motion'. The right box contains the text 'CAUSE: Object Pushed in Opposite Direction as Its Motion'. To the right of these boxes is a vertical column of cards. Each card is divided into two sections: 'Before push' and 'After push'. The cards show a ball and a blue arrow representing force. The first six cards show the ball moving in the same direction as the force arrow. The last two cards show the ball moving in the opposite direction of the force arrow. Below the cards are two text boxes: 'EFFECT: OBJECT REVERSES DIRECTION' and 'EFFECT: OBJECT STOPS'. At the bottom right of the card column is a 'Scroll bar'.

In this activity, you will use a Sorting Tool to review **cause-and-effect relationships** between forces and velocity changes.



Homework

Identifying Cause and Effect

1. Open the *Force and Motion* Sorting Tool activity: [Cause and Effect](#).
2. When your model is complete, press HAND IN.

Goal: Identify the direction of the force that will cause each change in velocity.

Do:

- Drag each card to the appropriate column.

End of Lesson



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Go 'Live' to Model Preparing to Teach

Force and Motion Classroom Wall

Unit Question

How do forces affect motion?

Chapter 1 Question

What caused the pod to change direction?

Key Concepts

1. A force is required to change the velocity of an object.

Vocabulary

velocity

Transition to model lesson 'LIVE' on the PLATFORM

End model lesson

Force and Motion Classroom Wall

Unit Question

How do forces affect motion?

Chapter 1 Question

What caused the pod to change direction?

Key Concepts

1. A force is required to change the velocity of an object.

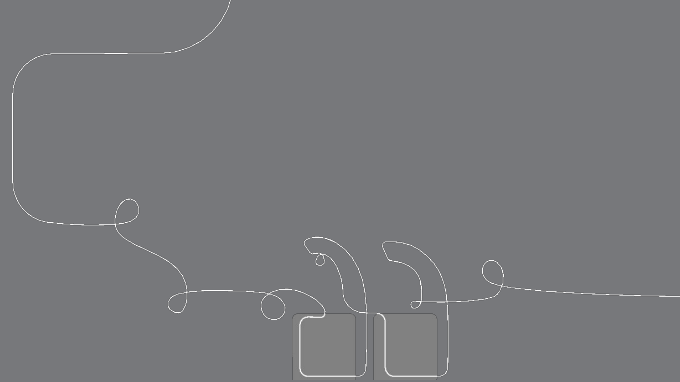
Vocabulary

velocity

I notice, I wonder...



Answer in the chat feature



What did you **notice** about the model lesson?

What do you now **wonder** ?

Chapter 1: What caused the pod to change direction?



Investigation Question:
What makes an object's motion change?



Multiple sources of evidence



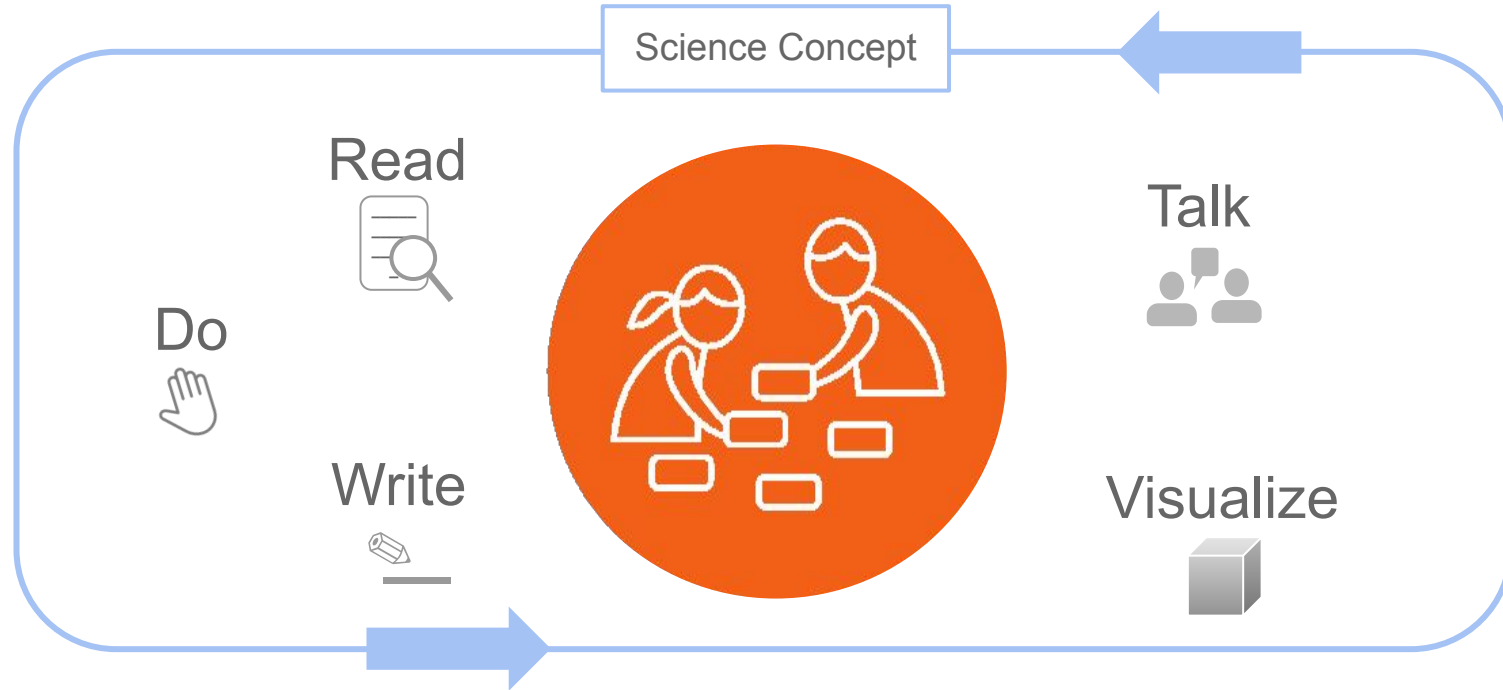
Hands-on
investigation



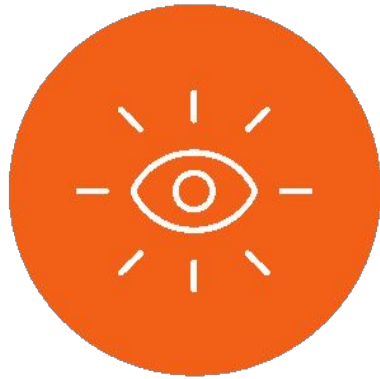
Simulation

Multimodal learning

Gathering evidence from different sources



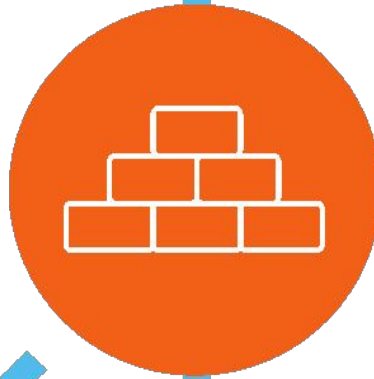
Amplify Science approach



Introduce a real world problem



Collect evidence from multiple sources



Build increasingly complex explanations



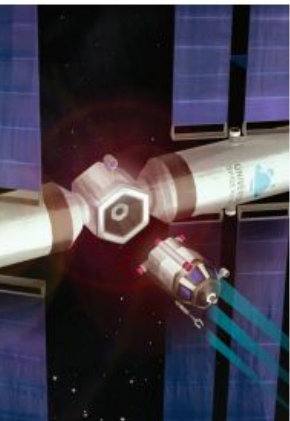
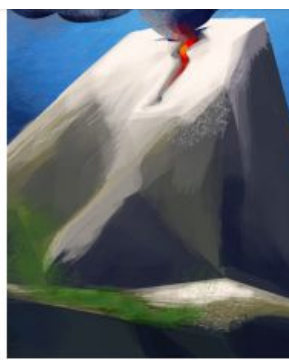
Apply knowledge to solve a different problem



Ask in the chat feature



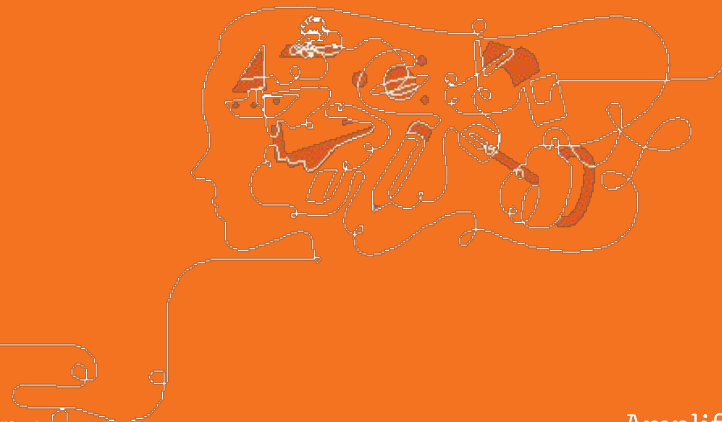
Questions?



Plan for the day

- ✔ What is Amplify Science?
- ✔ Navigation essentials
- ✔ Teaching a phenomenon-based lesson
- Unit Guide Resources
- Assessments
- Closing and reflection

Unit Guide Resources



Unit Guide Resources

Planning for the Unit

Unit Overview



Unit Map



Progress Build



Getting Ready to Teach



Materials and Preparation



Science Background



Standards at a Glance



Teacher References

Lesson Overview Compilation



Standards and Goals



3-D Statements



Assessment System



Embedded Formative Assessments



Books in This Unit



Apps in This Unit



Flextensions in This Unit



Printable Resources



Coherence Flowcharts



Copymaster Compilation



Flextension Compilation



Investigation Notebook



Multi-Language Glossary



NGSS Information for Parents and Guardians



Print Materials (8.5" x 11")



Print Materials (11" x 17")

Offline Preparation

Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.

Offline Guide

Unit Guide resources

Once a unit is selected, select **JUMP DOWN TO UNIT GUIDE** in order to access all unit-level resources in an Amplify Science unit.

Planning for the unit

Unit Overview	Describes what's in each unit, the rationale, and how students learn across chapters
Unit Map	Provides an overview of what students figure out in each chapter, and how they figure it out
Progress Build	Explains the learning progression of ideas students figure out in the unit
Getting Ready To Teach	Provides tips for effectively preparing to teach and teaching the unit in your classroom
Materials and Preparation	Lists materials included in the unit's kit, items to be provided by the teacher, and briefly outlines preparation requirements for each lesson
Science Background	Adult-level primer on the science content students figure out in the unit
Standards at a Glance	Lists NGSS Standards (Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts), Common Core State Standards for English Language Arts, and Common Core State Standards for Mathematics

Teacher references

Lesson Overview Compilation	Lesson Overview of each lesson in the unit, including lesson summary, activity purposes, and timing
Standards and Goals	Lists NGSS (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts) and CCSS (English Language Arts and Mathematics) standards in the unit, explains how the standards are reached
3-D Statements	Describes 3-D learning across the unit, chapters, and in individual lessons
Assessment System	Describes components of the Amplify Science assessment system, identifies each 3-D assessment opportunity in the unit
Embedded Formative Assessments	Includes full text of formative assessments in the unit
Articles in This Unit	Summarizes each unit text and explains how the text supports instruction
Apps in This Unit	Outlines functionality of digital tools and how students use them (in grades 6-8)
Flextensions in This Unit	Summarizes information about the Hands-On Flextension lesson(s) in the unit

Printable resources

Coherence Flowcharts	Visual representation of the storyline of the unit
Copymaster Compilation	Compilation of all copymasters for the teacher to print and copy throughout the unit
Flextension Compilation	Compilation of all copymasters for Hands-on Flextension lessons throughout the unit
Investigation Notebook	Digital version of the Investigation Notebook, for copying and projecting
Multi-Language Glossary	Unit vocabulary words in 10 languages
NGSS Information for Parents and Guardians	Information for parents about the NGSS and the shifts for teaching and learning
Print Materials (8.5" x 11")	Digital compilation of printed cards (i.e. vocabulary cards, student card sets) provided in the kit
Print Materials (11" x 17")	Digital compilation of printed Chapter Questions and Key Concepts provided in the kit

Unit Guide Exploration

Scavenger Hunt

Unit Guide scavenger hunt

The purpose of this optional activity is to practice utilizing the Unit Guide resources to answer questions. Practicing now will help you determine which Unit Guide resources to use when questions arise as you're teaching. Use the Unit Guide Resources document to help decide and record which resource you would use to answer each question. For additional practice, open the resource you've identified, and record your answer in the space provided.

What do students do in the first activity of Lesson 3.1?

Unit Guide document to reference:	Answer:

Which lesson will take the most time to prepare for Chapter 1?

Unit Guide document to reference:	Answer:

Describe one piece of evidence students can get using the Simulation.

Unit Guide document to reference:	Answer:

What is some background information pertaining to the science content of the unit?

Unit Guide document to reference:	Answer:

Unit Guide scavenger hunt cont.

List some of the NGSS crosscutting concepts emphasized in the unit.

Unit Guide document to reference:	Answer:

Describe one material you will print and make copies of during this unit.

Unit Guide document to reference:	Answer:

What is one article that students read in this unit?

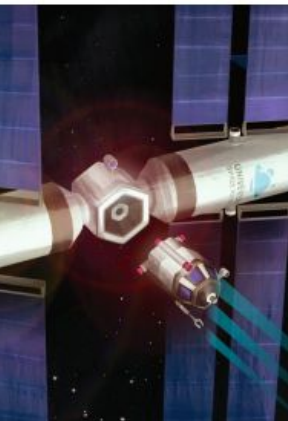
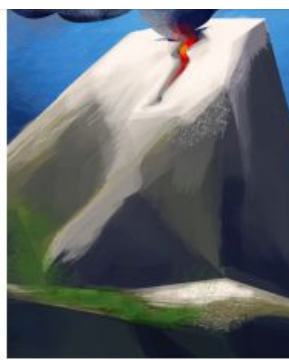
Unit Guide document to reference:	Answer:

Which lessons in Chapter 2 include On-the-Fly Assessments?

Unit Guide document to reference:	Answer:

5 min break



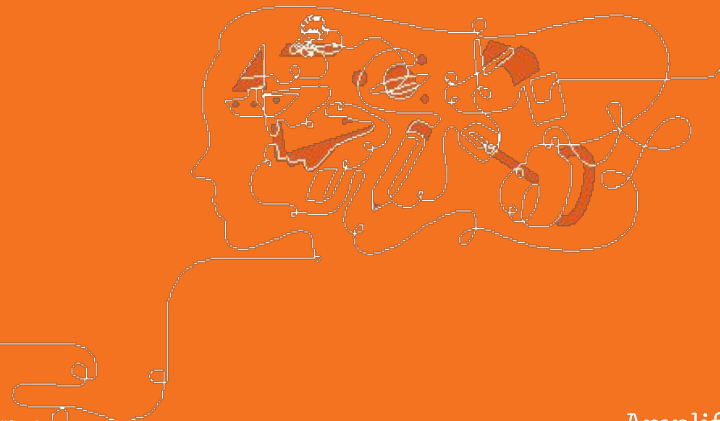


Plan for the day

- ✔ What is Amplify Science?
- ✔ Navigation essentials
- ✔ Teaching a Lesson
- ✔ Unit Guide Resources
- Assessments
- Closing and Reflection

Progress Build

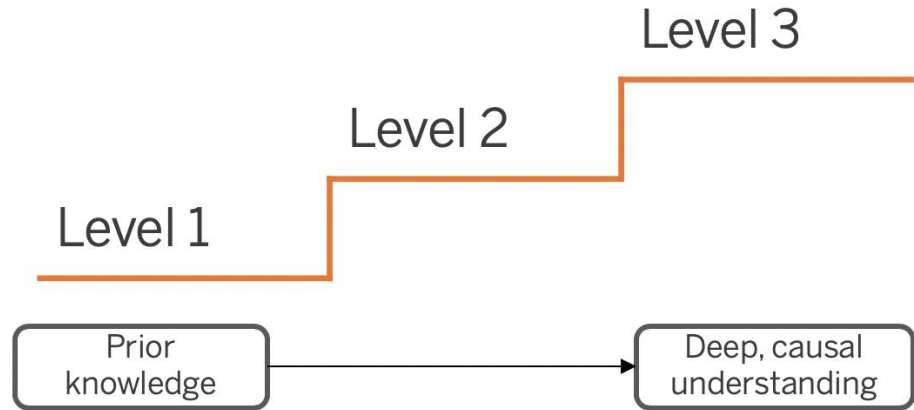
A unit-specific learning progression



Progress Build

Teaching tip

Being familiar with your unit's Progress Build means you know what's coming. This will help you avoid giving ideas away too early in the unit!



Force and Motion

How do these ideas relate to one another?

- A force causes a change in an object's velocity.
- An object's mass determines its velocity change for a given force.



Earth, Moon and Sun

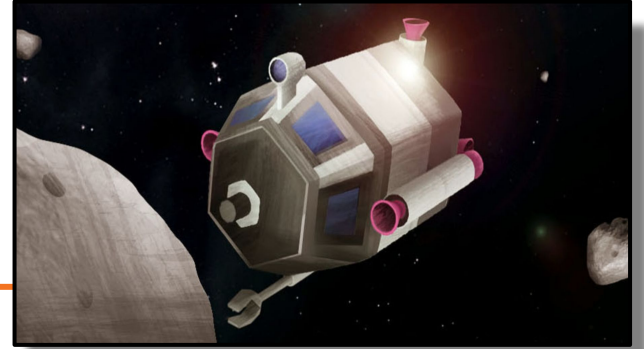
Building upon a foundation

Chapter 1

A force causes a change in an object's velocity.

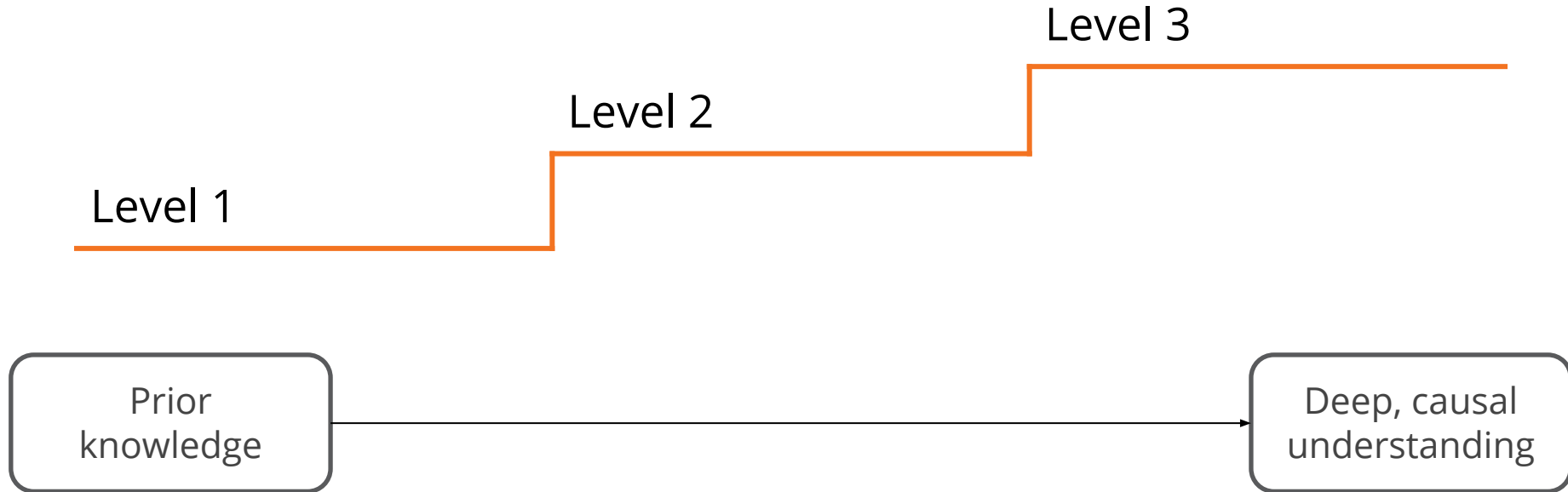
Chapter 2

An object's mass determines its velocity change for a given force.



Progress Build

A unit-specific learning progression



Earth, Moon, and Sun Progress Build

Level 1

A force causes a change in an object's velocity.

Level 2

An object's mass determines its velocity change for a given force

Level 3

When two objects collide, both experience the same strength force, but in opposite directions

Prior knowledge

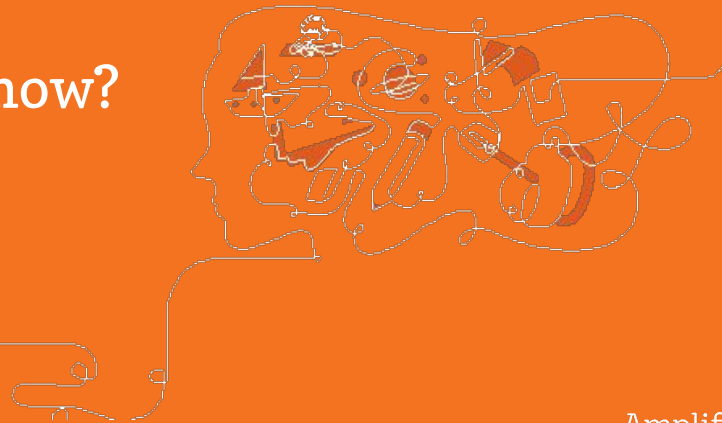
Deep, causal understanding

5 min break



Assessment System

Think to yourself: How do your students show you what they know?



Pre- and End-of-Unit Assessments

Pre-Unit
Assessment

End-of-Unit
Assessment

Level 3

Level 2

Level 1

Critical Juncture Assessments

Pre-Unit
Assessment



Critical Juncture

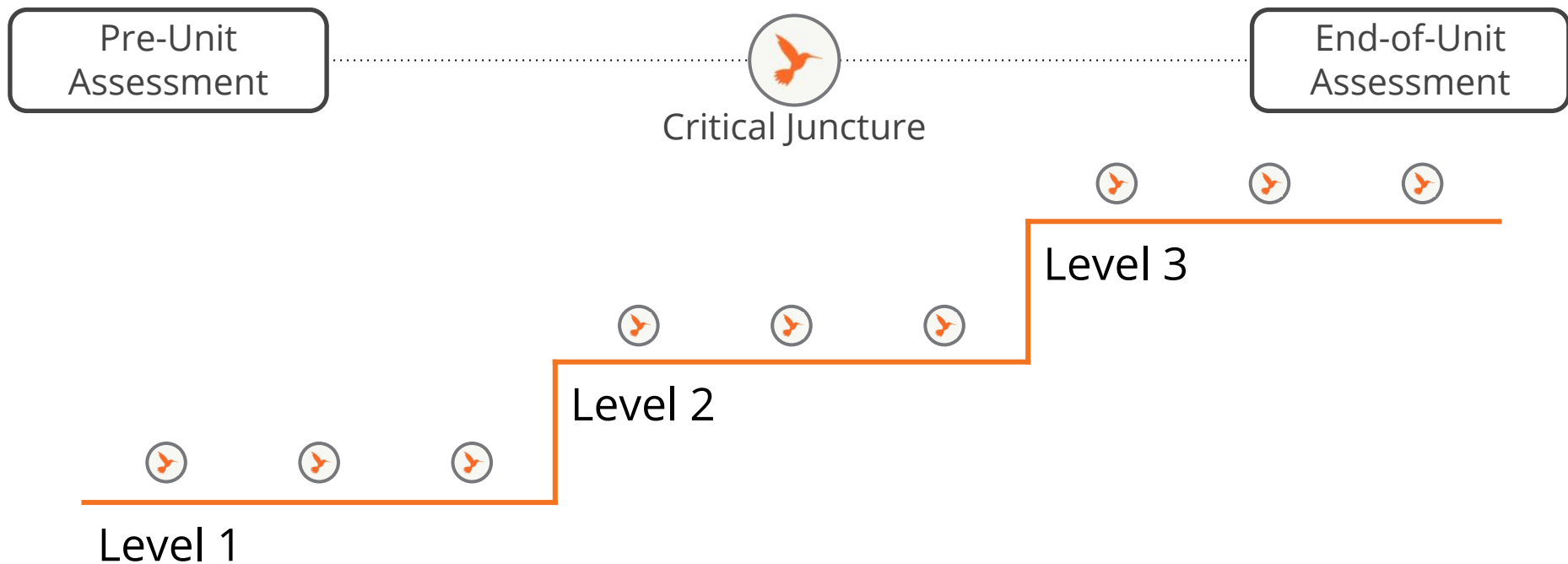
End-of-Unit
Assessment

Level 3

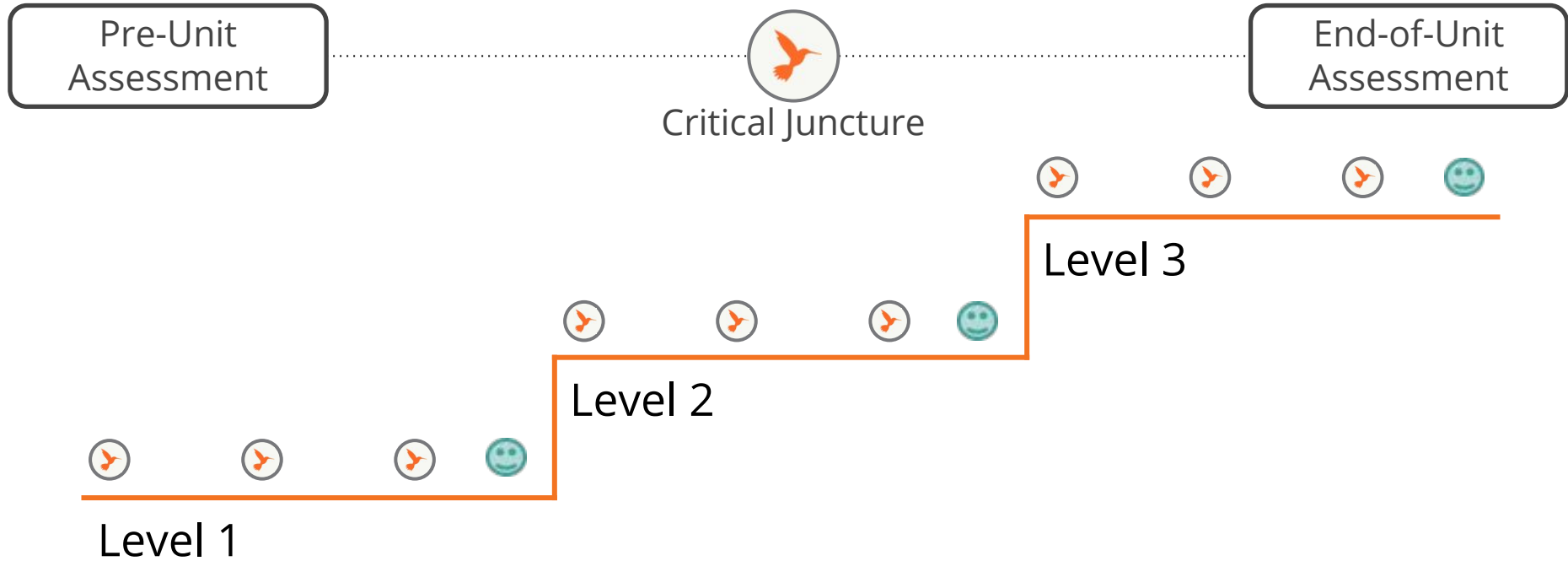
Level 2

Level 1

On-the-Fly Assessments

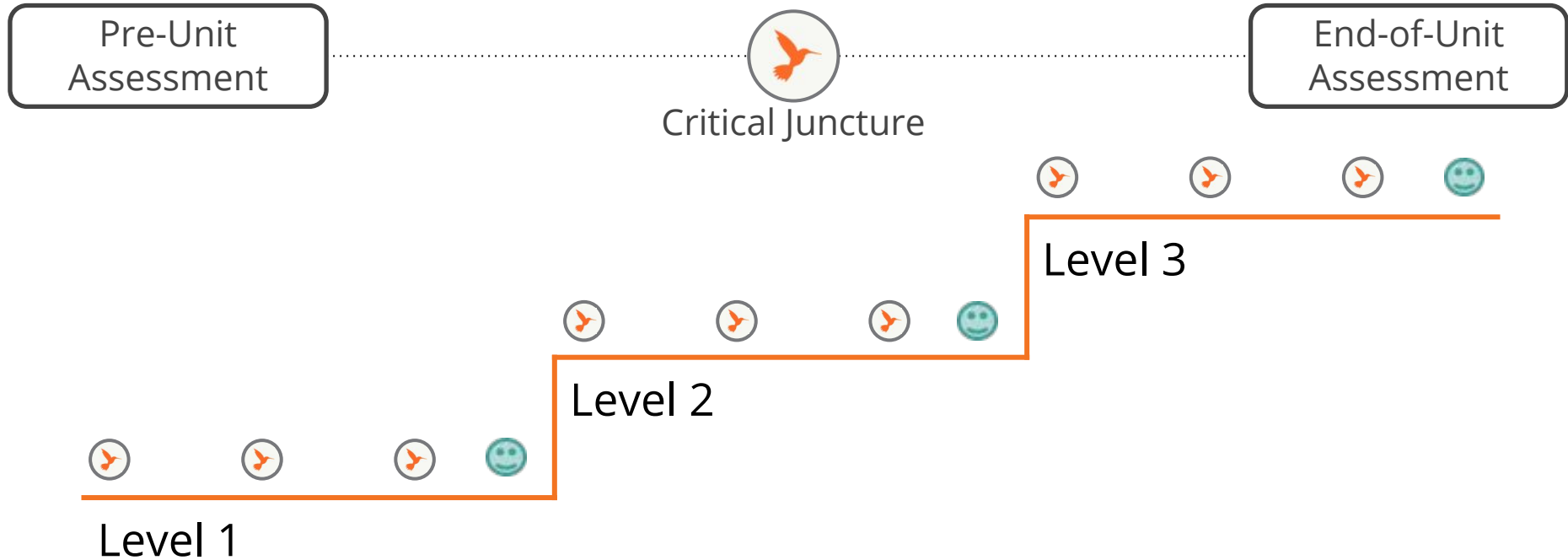


Student Self-Assessments



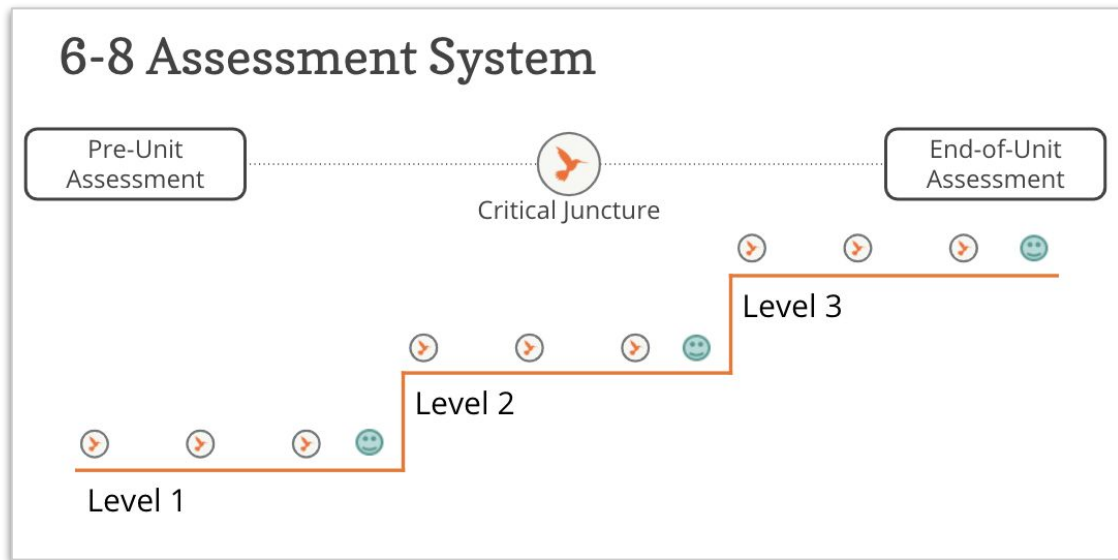
6-8 Assessment System

Pages 11-12



Capture your thinking!

How will you use these embedded assessment opportunities?



Unit Level Assessment Documents

Assessment System:

- explains the organization of the assessment system
- lists out each assessment in the unit with key information
- goes into an explanation of each type of assessment found in the unit

Assessment Opportunity	Next Generation Science Standards	Printable Resources
Lesson 1.1: 3-D Performance Task: Scientific Explanation	DCI: <ul style="list-style-type: none">• PS3.A: Definitions of Energy SEPs: <ul style="list-style-type: none">• Practice 1: Asking Questions and Defining Problems• Practice 6: Constructing Explanations and Designing Solutions CCC: <ul style="list-style-type: none">• Systems and System Models	Coherence Flowcharts
Assessment Type: Pre-Unit Assessment		Copymaster Compilation
Evaluation Guidance: <ul style="list-style-type: none">• Assessment Guide (in Digital Resources for Lesson 1.1), with support for revealing students' prior knowledge, preconceptions, and to gauge their facility for using the SEPs and CCCs.• Possible Student Responses		Flextension Compilation
		Investigation Notebook
		Multi-Language Glossary
		NGSS Information for Parents and Guardians

Embedded Formative Assessments:

- explains what to look for at each assessment opportunity
- gives guidance for instructional next steps



Standards and Goals
3-D Statements
Assessment System
Embedded Formative Assessments
Books in This Unit
Apps in This Unit
Flextensions in This Unit

Lesson 1.2, Activity 4

On-the-Fly Assessment 1: Synthesizing Information

Look for: This lesson provides students' first opportunity to learn about and discuss how to synthesize information as a reading strategy. They will continue to develop facility with this strategy throughout the unit through repeated practice. As you circulate, make note of what students are connecting to the reading and what deeper understanding they come to as a result. Are they connecting together relevant pieces of information from different sources? Are they using these connections to help them better understand systems?

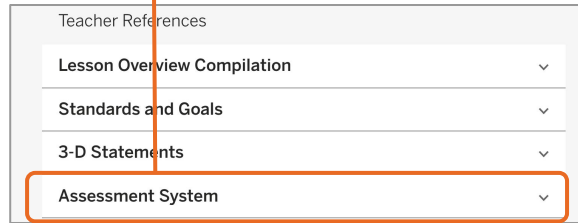
Now what? If students are having trouble getting started with synthesizing, or if they are connecting the reading to unrelated information, provide some additional models. You may wish to provide examples that combine information from the first section of *Systems* with information from other sources. Depending on how many students need this support, you could either coach a few students individually during the reading or you could work with a small group or the whole class. Be sure to remind students to keep in mind the goal of connecting pieces of information in order to come to a deeper understanding of the concept of systems.

Go 'live' to show assessment resources and assessments

Review an assessment

Part 1: Choose an Assessment Opportunity

1. Navigate to the *Assessment System* reference in the Unit Guide

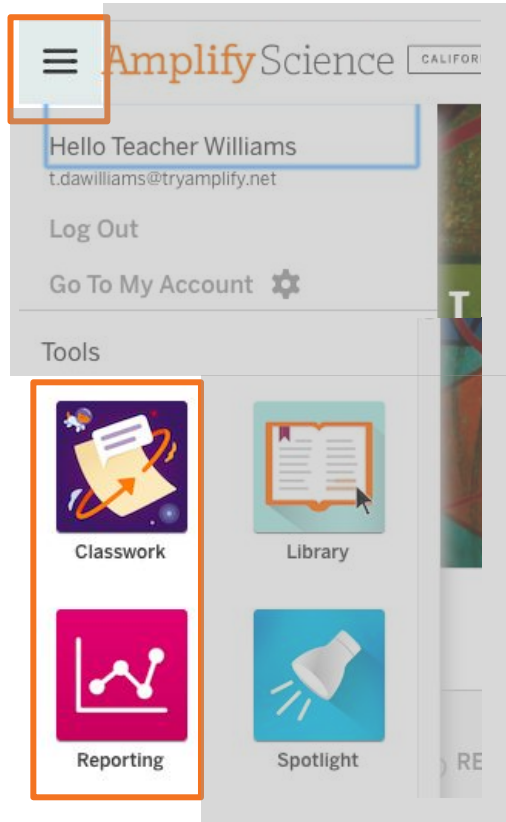


2. Choose an 'Assessment opportunity' to preview.
i.e. Pre-Unit, On-the-Fly, Critical Juncture, or End-of-Unit
3. Navigate to the lesson and review the assessment

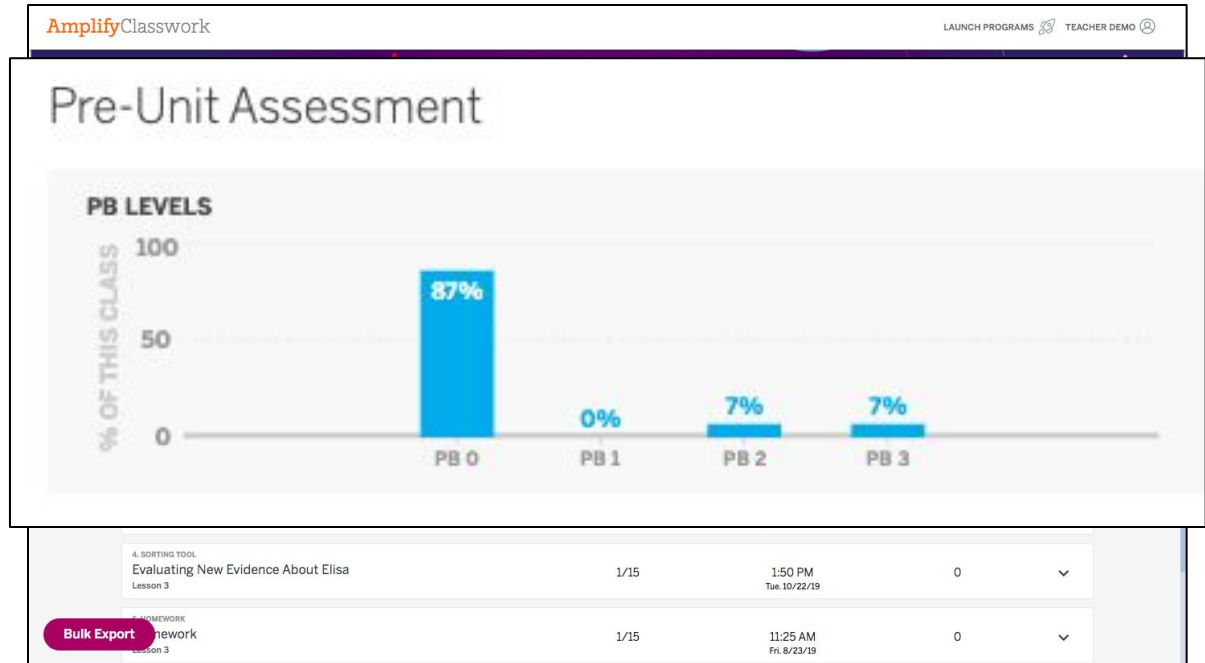
Part 2: Review the Assessment

4. As you review the assessment, answer these questions:
 - a. What are students doing?
 - b. What would student performance tell me about student understanding?
 - c. How could I adjust instruction based on student performance?
 - d. How could I record student data?

Classwork and Reporting



The sidebar of the Amplify Science interface includes a hamburger menu icon, the user's name and email, a log out button, and a settings icon. Below these are four tool icons: Classwork, Library, Reporting, and Spotlight. The Classwork and Reporting icons are highlighted with an orange border.



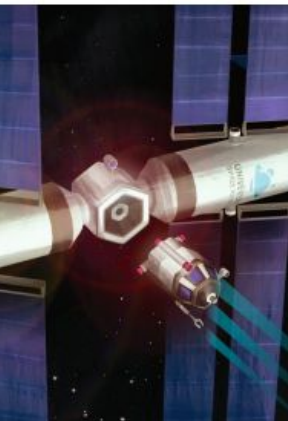
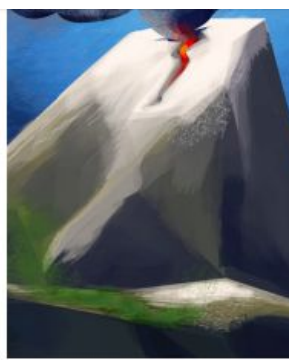
Go 'live' to show classwork and reporting tool



Ask in the chat feature



Questions?



Plan for the day

- ✓ What is Amplify Science?
- ✓ Navigation essentials
- ✓ Teaching a phenomenon-based lesson
- ✓ Unit Guide Resources
- ✓ Assessments
- Closing and reflection

Navigation Temperature Check

Rate yourself on your comfort level accessing Amplify Science materials and navigating a digital curriculum.

1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable

Navigation Temperature Check

Rate yourself on your comfort level with navigating the digital curriculum.

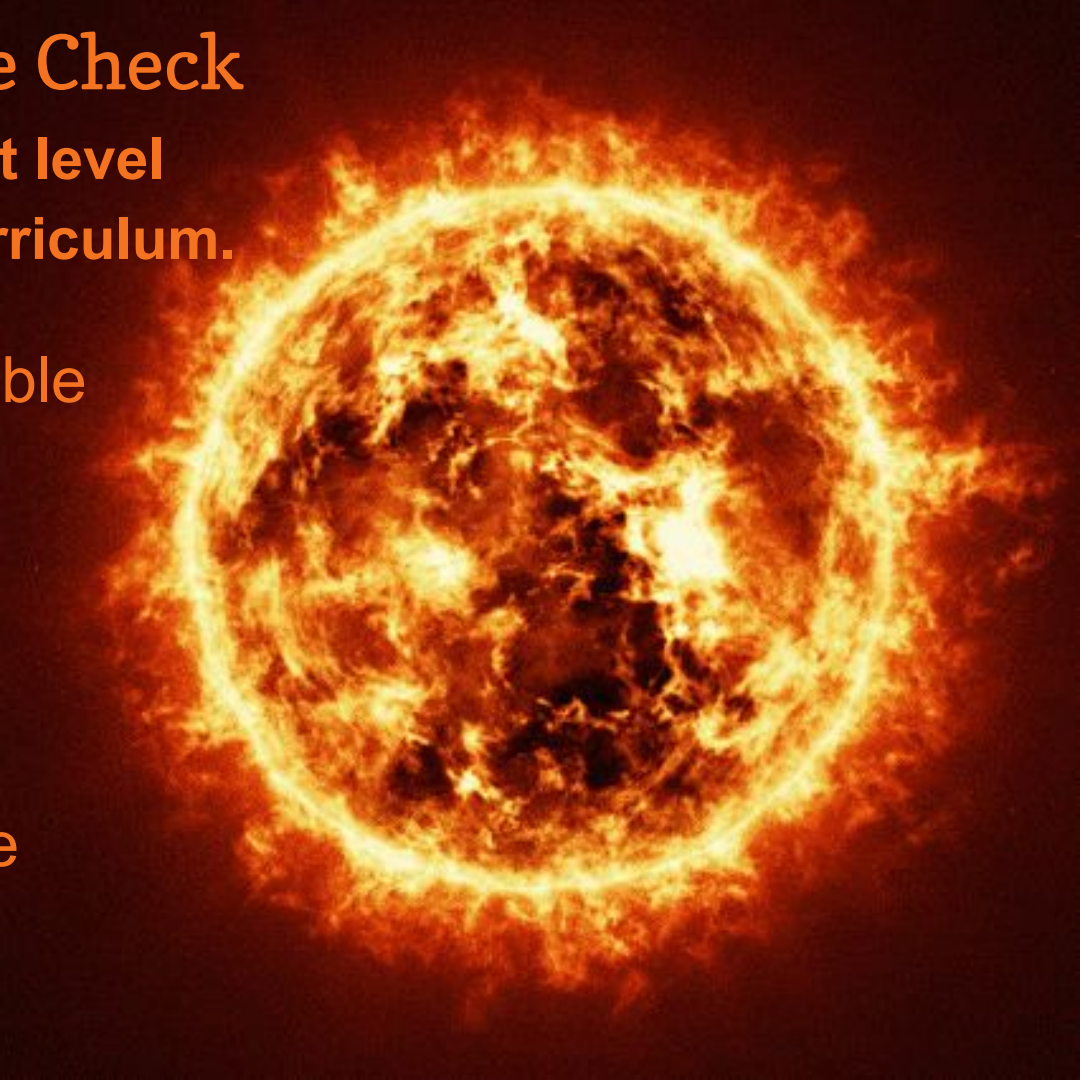
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable





Ask in the chat feature



Questions?

Revisiting Day 1 Objectives

Are you able to...

- Navigate the Amplify Science curriculum?
- Understand the program's phenomenon-based approach and instructional materials?

Day 2 Objectives

By the end of day 2 you will be able to:

- Understand the purpose of Launch Units.
- Apply program essentials to prepare to teach an Amplify Science Launch Unit.
- Make an informed decision about which of the Amplify Science Hybrid Learning Resources will best support your students.

Overarching goals

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

- Navigate the Amplify Science curriculum.
- Understand the program's multimodal approach and instructional materials.
- Apply program essentials to prepare to teach an Amplify Science unit.
- Make an informed decision about which of the Amplify Science Hybrid Learning Resources will best support your students.



Closing reflection

Based on our work today, share:



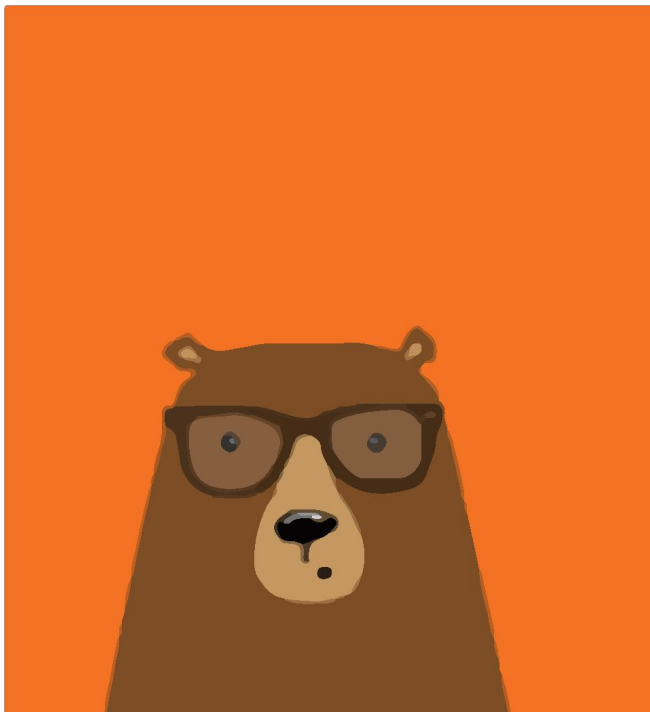
Answer in the chat feature

Brain: something you'll keep in mind

Heart: something you're feeling

Feet: something you're planning to do

Additional Amplify resources



Program Guide

Gather additional insight into the program's structure, intent, philosophies, supports, and flexibility.

my.amplify.com/programguide

Amplify Help

Find advice and answers from the Amplify team.

my.amplify.com/help

Additional Amplify support

Customer Care

Access information specific to enrollment and rosters, technical support, materials and kits, and teaching support, weekdays 7AM-7PM EST.



scihelp@amplify.com



800-823-1969



Amplify Chat

Additional Amplify Support

Customer Care

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support, weekdays 7AM-7PM EST.



scihelp@amplify.com



800-823-1969



Amplify Chat

When contacting the customer care team:

- Identify yourself as an Amplify Science user.
- Note the unit you are teaching.
- Note the type of device you are using (Chromebook, iPad, Windows, laptop).
- Note the web browser you are using (Chrome or Safari).
- Include a screenshot of the problem, if possible.
- Copy your district or site IT contact on emails.

Thank you for your participation in day 1.
See you tomorrow for day 2!

