

Amplify Science

The Assessment System

Grade K, Unit 2: Pushes and Pulls

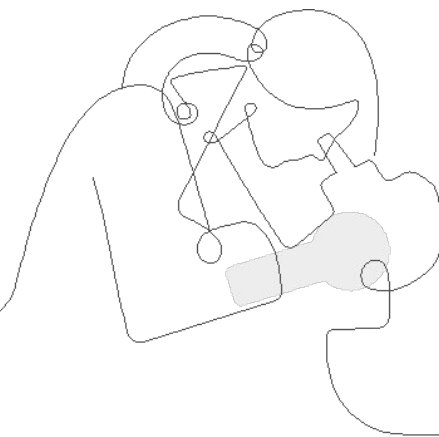
Part 3

Strengthen workshop

School/District Name

Date

Presented by Your Name



Amplify's Purpose Statement

Dear teachers,

You do a job that is nearly impossible and **utterly essential**.

We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

Thank you for working with us to craft rigorous and riveting learning experiences for your classroom.

We share your goal of **inspiring all students to think deeply, creatively, and for themselves**.

Sincerely,
Amplify

Schoolology



[← Back to Schoology Home Page](#)

LMS App Center

The LMS App Center provides a catalog of District-approved digital content and learning tools (including digital components of adopted textbooks) that are available for classroom teachers and students to access within the learning management system, Schoolology.

For information on District-approval policies and procedures, please visit: [udipp.lausd.net](#).

- To search the full list of digital learning tools, click "Submit".
- To search by Publisher Name or Textbook Title, type in a word associated to your adopted publisher, then click "Submit".
- To narrow your search with filters such as Content Area, Grade Level, or Content Type, select from the dropdown menu, then click "Submit".

To learn more about using the LMS App Center, please refer to the following video overview.

Publisher Name Starts With

Content Area All

Grade Level All

Content Type All

Textbook Title Starts With

All Amplify Products



LMS App Center

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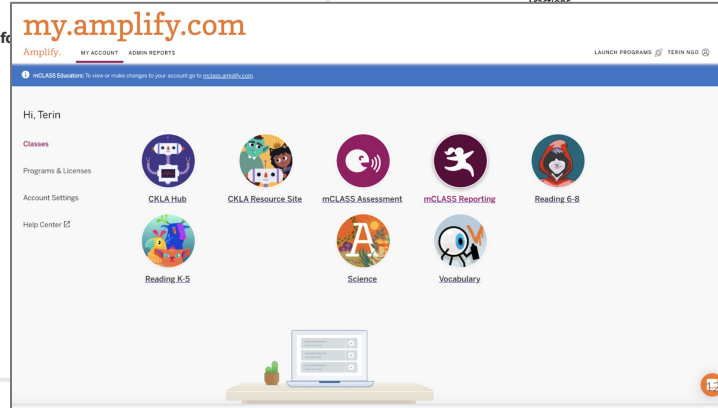
To learn more about using the LMS App Center, please refer to the following video overview.

[← Search Again](#)

Amplify

Content Area: ELA
Grade Level: ES
Content Type: Supplemental
Integration Type: App (Left Navigation)
Purchase Type: District and School
[Getting Started Guide](#)
Other Info: School licenses required
mCLASS
CKLA
Amplify Reading
Amplify Science
Creative

Vendor Support Desk:
P: 800.823.9969
E: help@amplify.com
S: amplify.com/support/
Textbook Title(s):
NA



Vendor Support Desk:
P: 800.823.9969
E: help@amplify.com
S: amplify.com/support/
Textbook Title(s):
NA

op is for
only)

Join Amplify Science Schoology Group

To join Amplify Science Schoology
ES Group: W4PK-W466-63F5B

Navigation Temperature Check

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

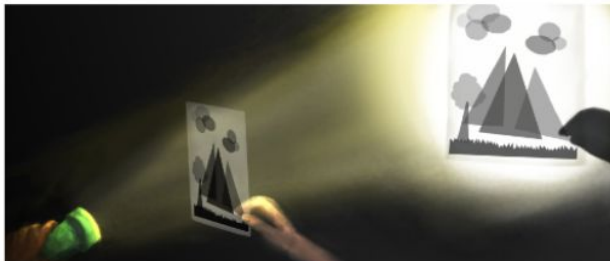
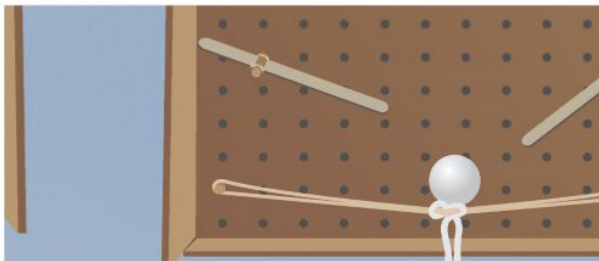
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable



Plan for the day

- Introduction
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Overarching goals

- ❑ Describe the structure and purpose of the Amplify Science Assessment System
- ❑ Plan for the strategic use of assessment resources to analyze and respond to student work

Let's connect
this goal to
our students



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.

Opening reflection

Why do we assess our students?

What is **challenging** about assessing our students?



Participant
Notebook

<https://bit.ly/3h8beEs>

Opening Reflection: Assessment

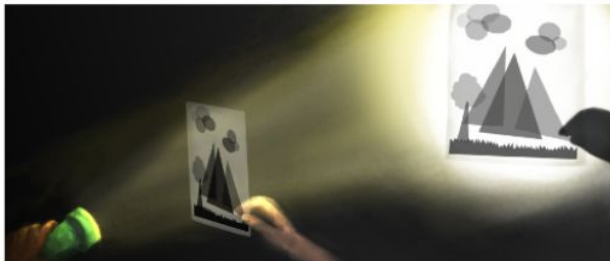
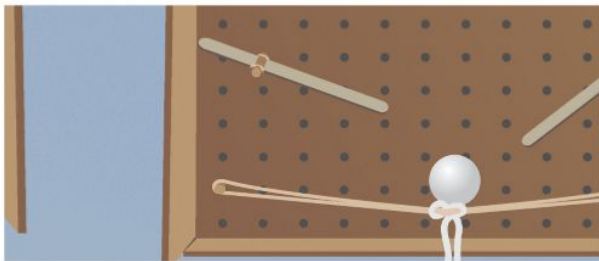


Why do we assess our students?



Why do we assess our students?



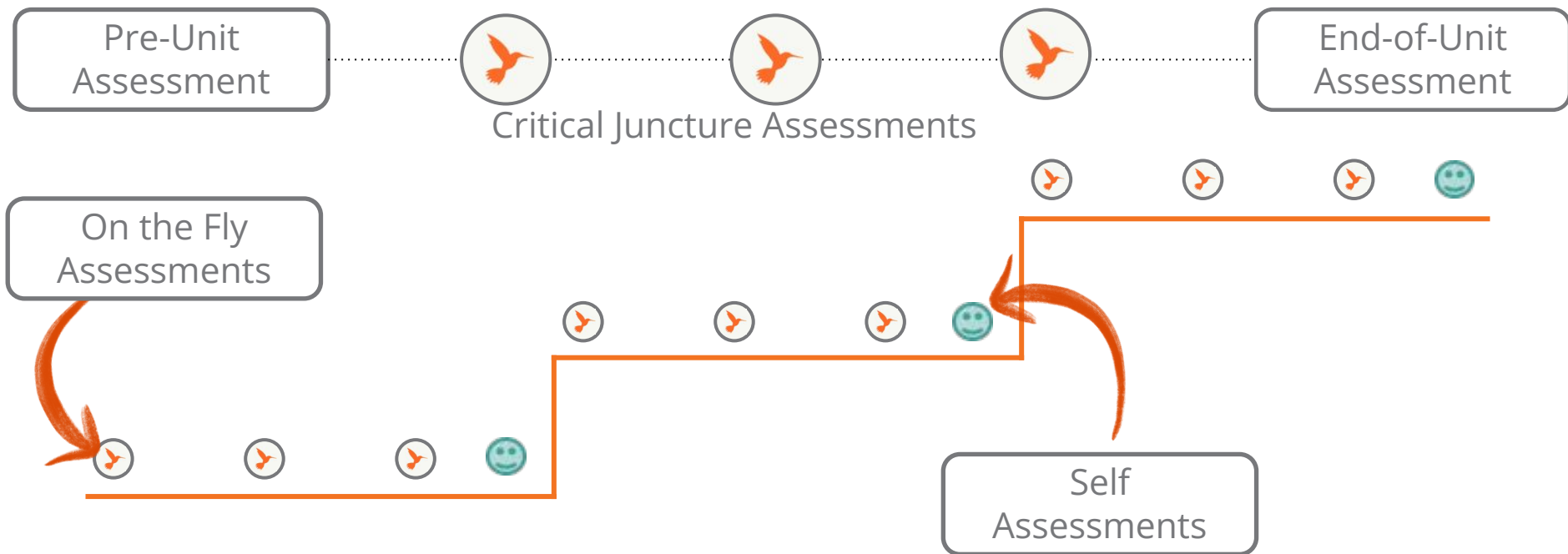


Plan for the day

- Introduction
- **Assessment System**
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

K-5 Assessment System

Pg. 4



Assessment System Document

Modeling Matters

22 Lessons

Modeling Matter

Printable Teacher Guide

Unit Overview

Chapters

Printable Resources

Planning for the Unit ^

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

Opportunities for Unit Extensions

Offline Preparation

Unit Overview

What's in This Unit?

Most people's greatest exposure to physical and chemical changes—at least those changes that are easily discernible—is through food and cooking. Like most everything else, foods are comprised mostly of mixtures, and the kitchen is the locale where we separate, dissolve, cool, heat, whip, emulsify, and further transform foods for some desired outcome. While experimenting with foods and their transformation has been happening since the dawn of humans, it has only been in the past century or so that food scientists have worked to apply scientific principles in order to better understand food. Food scientists work to ensure that the

Read more >

Chapters

Chapter 1: Why did the food coloring separate into different dyes? ⓘ

LESSON 1.1

Pre-Unit Assessment

LESSON 1.2

Introducing Food Science

LESSON 1.3

Made of Matter

LESSON 1.4

Separating a Food-Coloring Mixture

LESSON 1.5

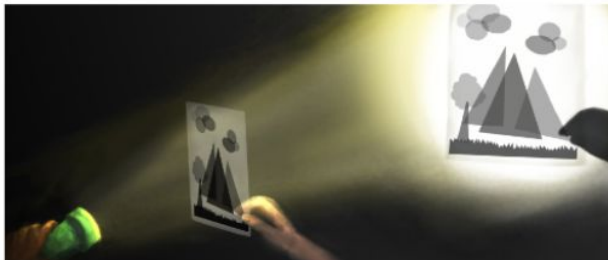
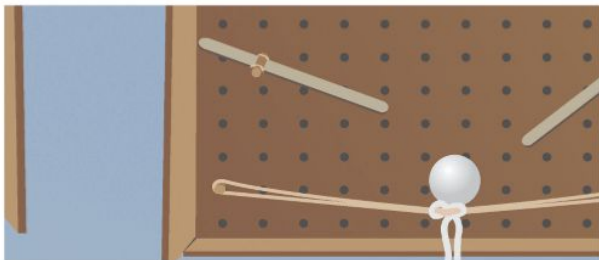
Exploring Another Model of Chromatography

LESSON 1.6

Nanovision Models of Chromatography

Questions?





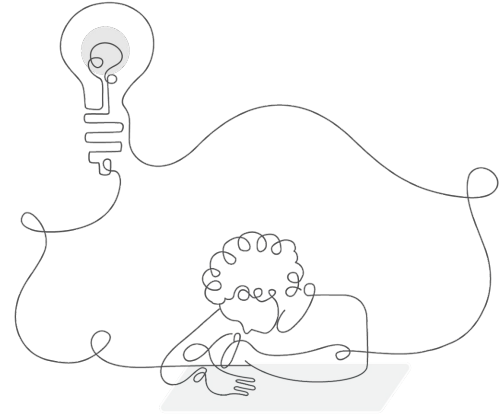
Plan for the day

- Introduction
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- **Progress Build**
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- Closing

Reviewing the unit phenomenon

Modeling Matter

Amplify Science units are designed around complex phenomena that drive student learning through the unit.



Pushes and Pulls

Problem: How can we create a pinball machine for our class?

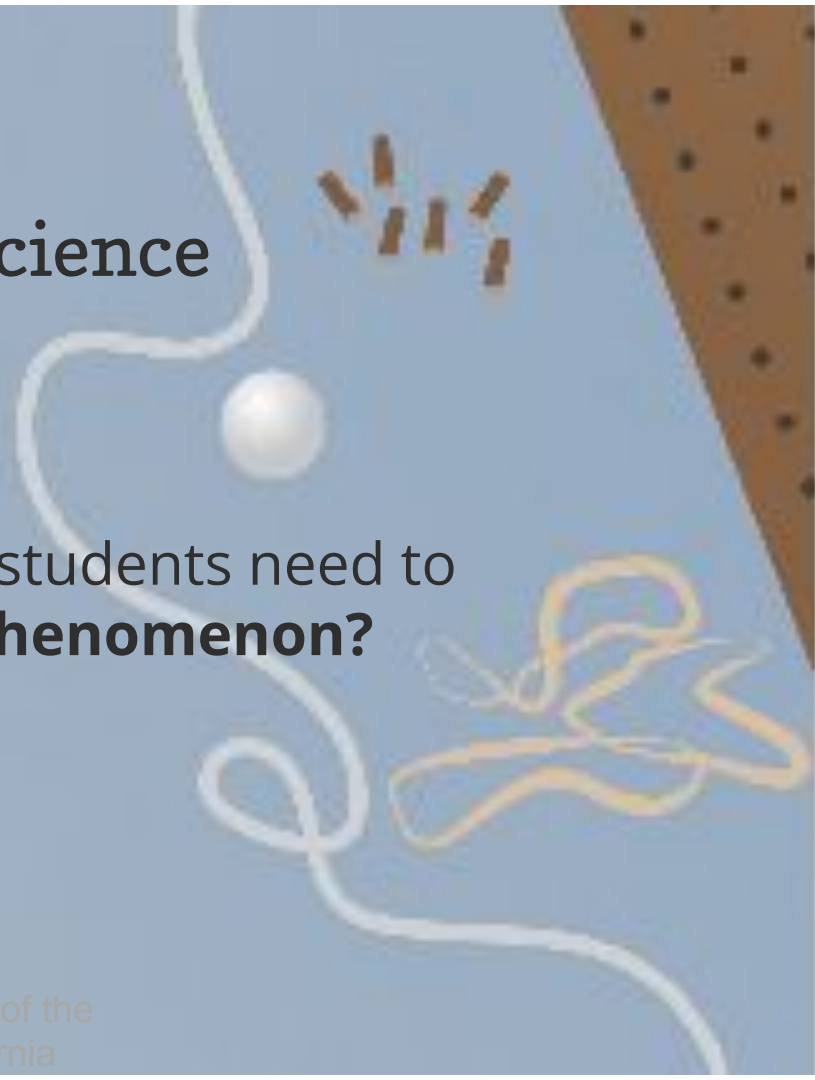
Role: Pinball Engineers

Students use their new understanding of the phenomena of force and motion to identify pushes and pulls more broadly in their lives.

Pushes and Pulls

Explaining the phenomenon: Science Concepts

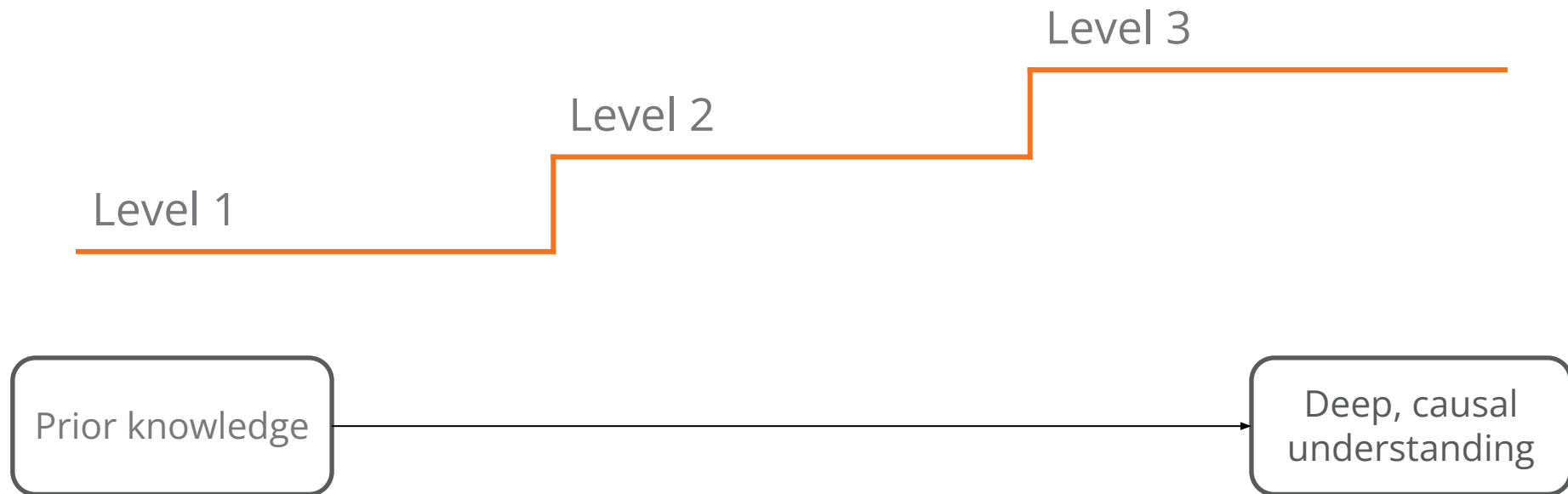
What **science concepts** do you think students need to understand in order to **explain the phenomenon**?



Progress Build

A unit-specific learning progression

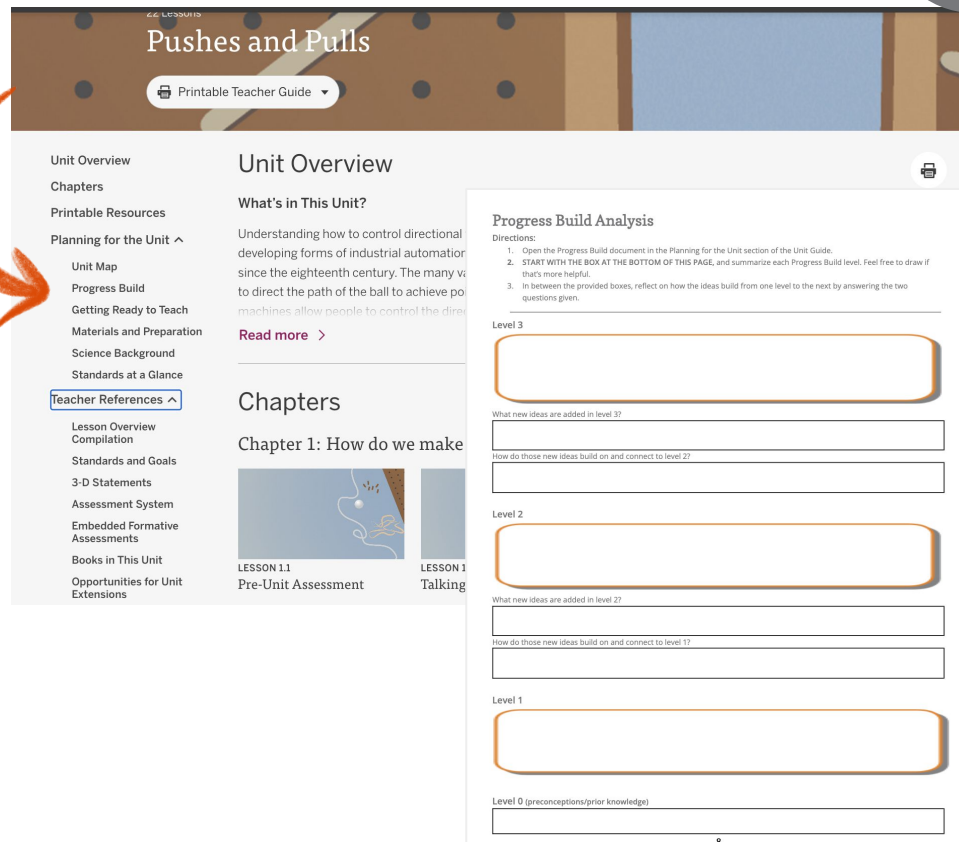
Pg. 4



Progress Build analysis

Work time

Read and analyze your unit's Progress Build.



The screenshot shows a digital interface for a unit titled "Pushes and Pulls". At the top, there is a header with the unit title and a "Printable Teacher Guide" button. Below the header is a sidebar menu with various links: Unit Overview, Chapters, Printable Resources, Planning for the Unit (expanded), Unit Map, Progress Build (highlighted with a red arrow), Getting Ready to Teach, Materials and Preparation, Science Background, Standards at a Glance, Teacher References (expanded), Lesson Overview, Compilation, Standards and Goals, 3-D Statements, Assessment System, Embedded Formative Assessments, Books in This Unit, and Opportunities for Unit Extensions. The main content area displays the "Unit Overview" section, including a "What's in This Unit?" paragraph, a "Read more" link, and a "Chapters" section for "Chapter 1: How do we make". Below the chapters are two lesson cards: "LESSON 1.1 Pre-Unit Assessment" and "LESSON 1 Talking". To the right of the sidebar, a "Progress Build Analysis" form is visible, containing directions and three levels of analysis (Level 3, Level 2, Level 1) with text boxes for responses. The form also includes a "Level 0 (preconceptions/prior knowledge)" section at the bottom.

Pushes and Pulls

Printable Teacher Guide

Unit Overview

Chapters

Printable Resources

Planning for the Unit ^

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

Opportunities for Unit Extensions

Unit Overview

What's in This Unit?

Understanding how to control directional developing forms of industrial automation since the eighteenth century. The many v to direct the path of the ball to achieve po machines allow people to control the direc

Read more >

Chapters

Chapter 1: How do we make

LESSON 1.1 Pre-Unit Assessment

LESSON 1 Talking

Progress Build Analysis

Directions:

1. Open the Progress Build document in the Planning for the Unit section of the Unit Guide.
2. START WITH THE BOX AT THE BOTTOM OF THIS PAGE, and summarize each Progress Build level. Feel free to draw if that's more helpful.
3. In between the provided boxes, reflect on how the ideas build from one level to the next by answering the two questions given.

Level 3

What new ideas are added in level 3?

How do those new ideas build on and connect to level 2?

Level 2

What new ideas are added in level 2?

How do those new ideas build on and connect to level 1?

Level 1

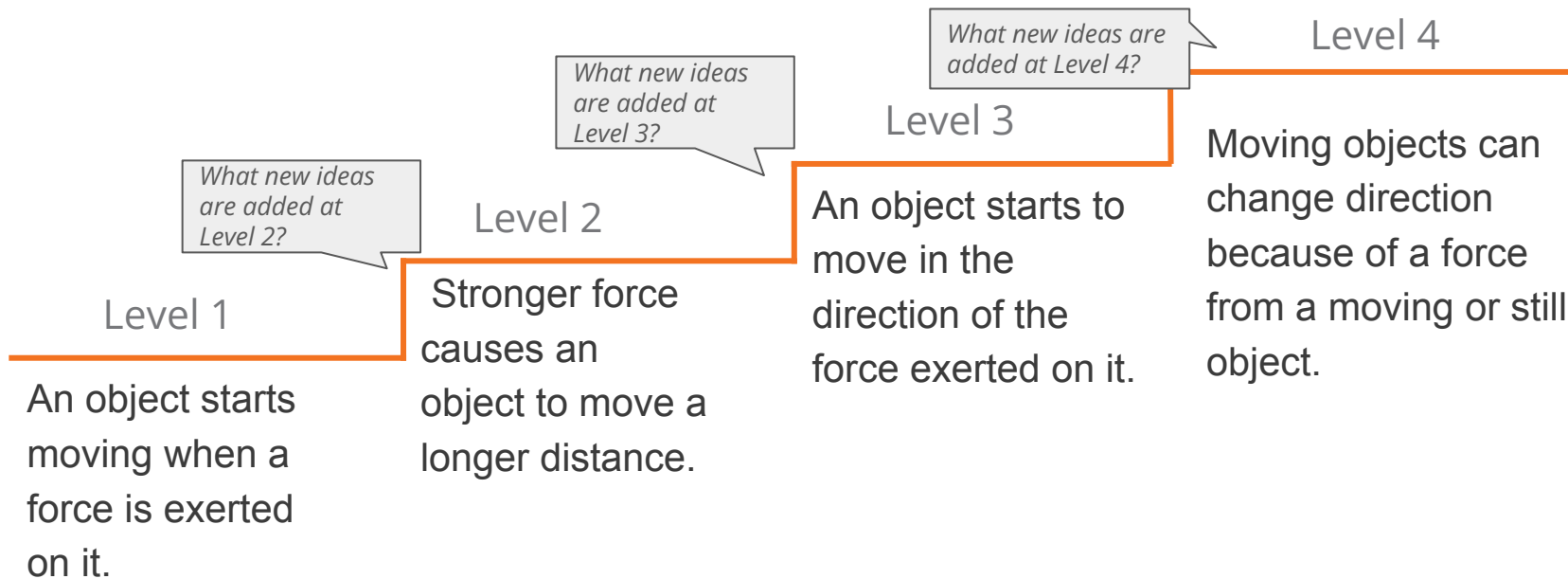
Level 0 (preconceptions/prior knowledge)

8

Progress Build

Pushes and Pulls

Assumed prior knowledge (preconceptions): There is no significant prior knowledge assumed. Students will certainly have experience with observing moving objects, including rolling balls, as well as making objects move in different ways. Students will have experience moving objects by pushing or pulling, but they likely have not thought carefully about how those objects do so. Students will have opportunities to explore these kinds of actions more carefully over the course of the unit.



Logging in (demo account)

Safari or Chrome

1. Go to **learning.amplify.com**
2. Select **Log in with Google**
3. If you're already logged in with other Google accounts, click **Use another account**
4. Enter teacher demo account credentials

- xxxxxxxx@pd.tryamplify.net
- Password: xxxx

Steps 1-2

Welcome to **Amplify**

G Log In with Google

C Log In with Clever

A. Log In with Amplify

SSO login

Step 3

Choose an account to continue to Amplify Curriculum Delivery Application

T Teacher Lambertsen
t.lambertsen@tryamplify.net

S Sophia Lambertsen
slambertsen@amplify.com

U Use another account

To continue, Google will share your name, email address, language preference, and profile picture with Amplify Curriculum Delivery Application. Before using this app, you can review Amplify Curriculum Delivery Application's [privacy policy](#) and [terms of service](#).

Step 4

Sign in with Google

Sign in to continue to Amplify Curriculum Delivery Application

Email or phone

Forgot email?

To continue, Google will share your name, email address, language preference, and profile picture with Amplify Curriculum Delivery Application. Before using this app, you can review Amplify Curriculum Delivery Application's [privacy policy](#) and [terms of service](#).

Create account

Next

Sign in with Google

Hi Teacher

n nationalsc20@pd.tryamplify.net

Enter your password

☐ Show password

To continue, Google will share your name, email address, language preference, and profile picture with Amplify Curriculum Delivery Application. Before using this app, you can review Amplify Curriculum Delivery Application's [privacy policy](#) and [terms of service](#).

Forgot password?

Next

Progress Build analysis

Group work time

- With your group or partner, create a visual representation of one level of the progress build.

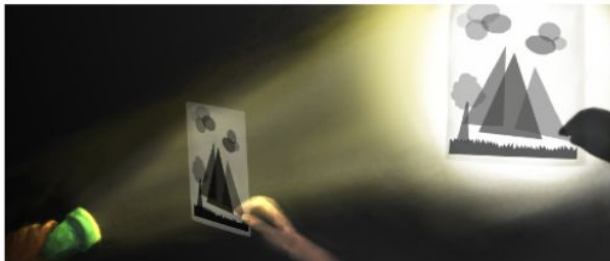
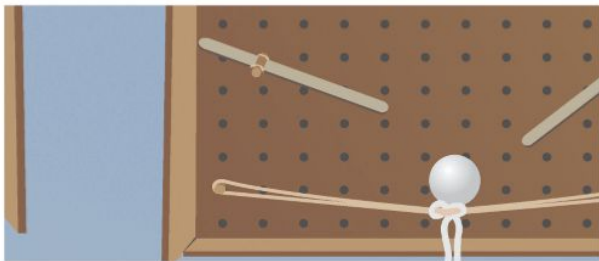


Progress Build analysis

Gallery Walk



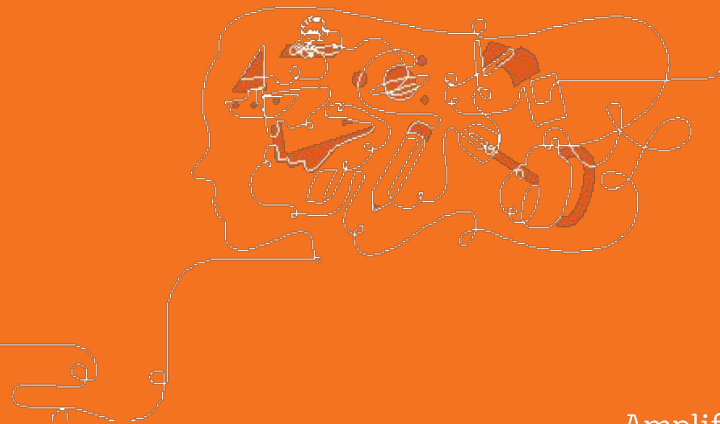
Break



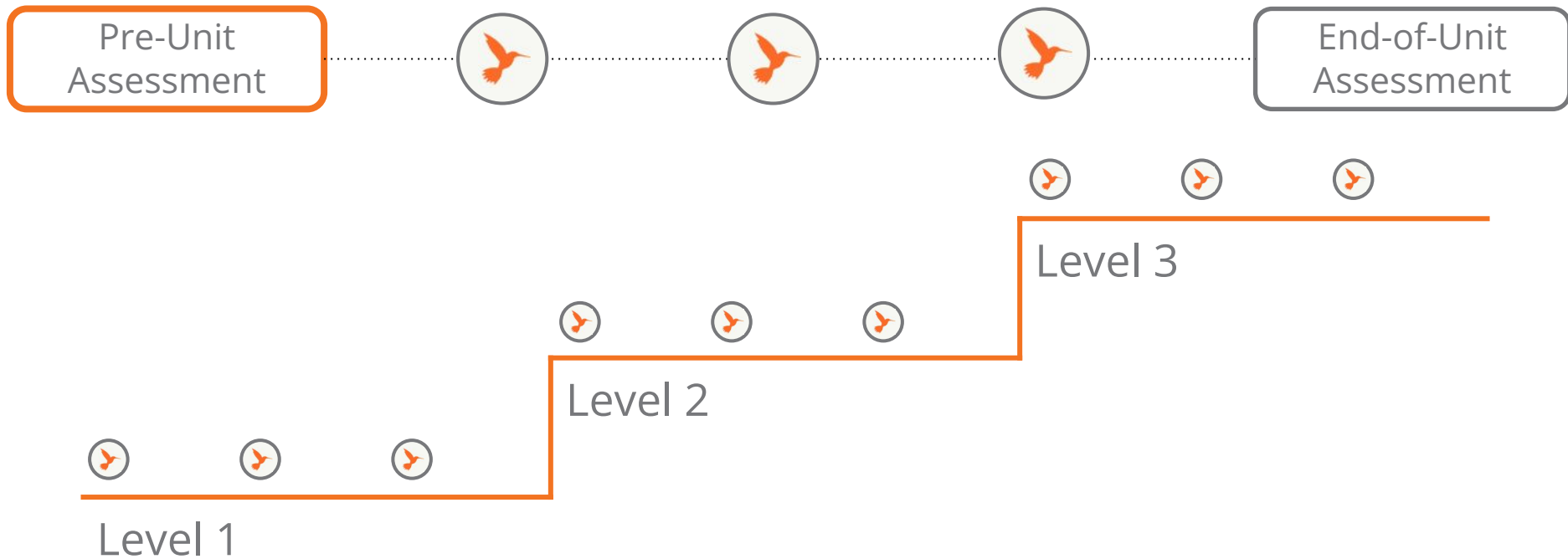
Plan for the day

- Introduction
- Assessment System
- Progress Build
- **Assessments**
- Model Lesson
- Planning
- Closing

Pre-Unit Assessment



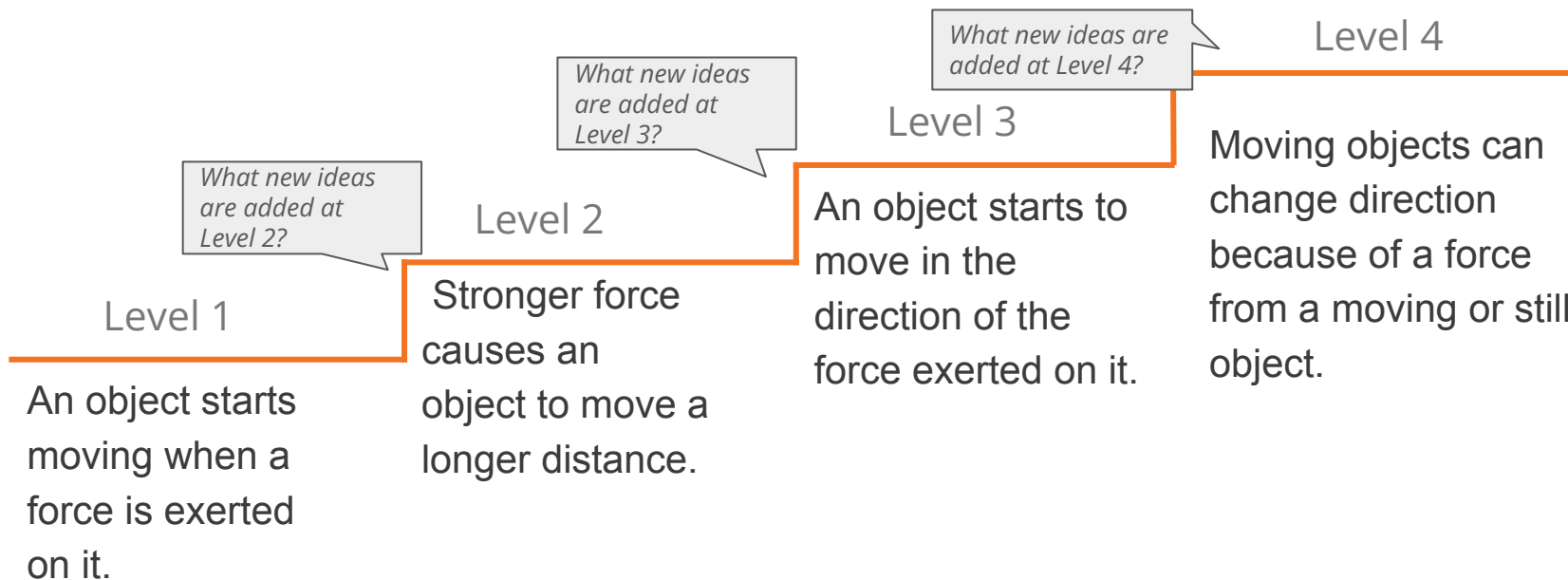
Pre-Unit Assessment



Progress Build

Pushes and Pulls

Assumed prior knowledge (preconceptions): There is no significant prior knowledge assumed. Students will certainly have experience with observing moving objects, including rolling balls, as well as making objects move in different ways. Students will have experience moving objects by pushing or pulling, but they likely have not thought carefully about how those objects do so. Students will have opportunities to explore these kinds of actions more carefully over the course of the unit.



Pre-Unit Assessment

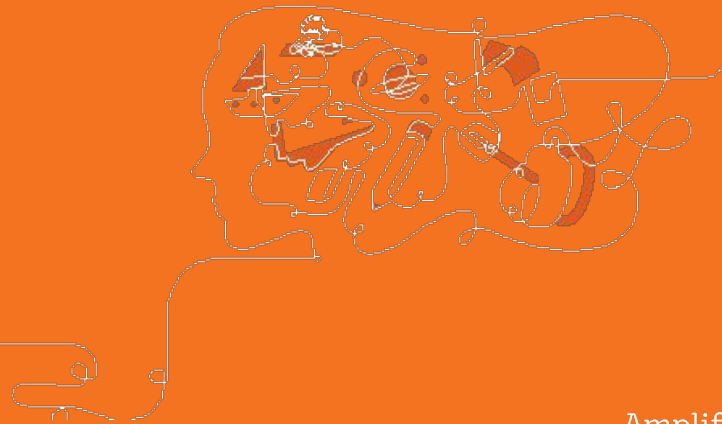
Lesson 1.1

Locate the Assessment Guide in Lesson 1.1 of your unit and skim it.

Open up the classroom slides and see how the pre-unit assessment is embedded in the lesson.

The screenshot shows a digital interface for a unit titled "Pushes and Pulls". At the top, it indicates "22 Lessons". Below the title is a "Printable Teacher Guide" button. A left sidebar contains a navigation menu with categories: "Unit Overview", "Chapters", "Printable Resources", "Planning for the Unit" (with a sub-menu arrow), "Materials and Preparation", "Science Background", "Standards at a Glance", "Teacher References" (highlighted with a blue box and a sub-menu arrow), and "Offline Preparation". The "Teacher References" sub-menu lists: "Lesson Overview", "Compilation", "Standards and Goals", "3-D Statements", "Assessment System", "Embedded Formative Assessments", "Books in This Unit", "Opportunities for Unit Extensions", and "Offline Preparation". The main content area is titled "Unit Overview" and includes a "What's in This Unit?" section with a paragraph about pinball machines and a "Read more" link. Below this is a "Chapters" section titled "Chapter 1: How do we make a pinball start to move?". It features a grid of lesson thumbnails, each with a pinball illustration. The first row shows "LESSON 1.1 Pre-Unit Assessment", "LESSON 1.2 Talking About Forces", and "LESSON 1.3 Forces Happen Between Two Objects". The second row shows two more thumbnails, partially visible.

Formative Assessments



K-5 Assessment System



Formative Assessment Document

Pushes and Pulls

22 Lessons

Pushes and Pulls

Printable Teacher Guide

Unit Overview

Chapters

Printable Resources

Planning for the Unit ^

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

Opportunities for Unit Extensions

Offline Preparation

Unit Overview

What's in This Unit?

Understanding how to control directional forces on a ball is the quest of many people—from soccer players to engineers developing forms of industrial automation to pinball machine players. Pinball machines and their precursors have been around since the eighteenth century. The many variants have all involved launching a ball into a field of obstacles and targets, attempting to direct the path of the ball to achieve points. In this unit, students will take on the role of pinball engineers to explore how pinball machines allow people to control the direction and strength of forces on a ball, which serves as the anchor phenomenon of the

Read more >

Chapters

Chapter 1: How do we make a pinball start to move? ①

LESSON 1.1
Pre-Unit Assessment

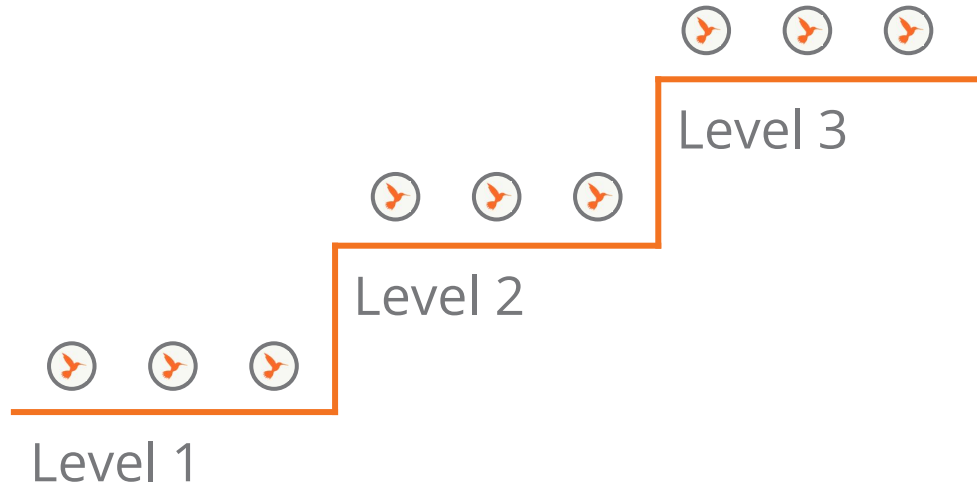
LESSON 1.2
Talking About Forces

LESSON 1.3
Forces Happen Between Two Objects



On-the-Fly Assessments

- Track student progress within a Progress Build level
- Embedded into instruction
- Assessment resource includes “Look for” and “Now what”
- Incremental build towards the Critical Juncture



Formative assessment information


Locating assessment resources

Full text of assessment

- Embedded Formative Assessments document
- Instructional guide
- Classroom Slides notes

Pushes and Pulls

Embedded Formative



Teacher action:

Assign pairs of students. Allow students time to share with their partners using your typical partner-share routine. Circulate and monitor how students are making sense of the movements that they visualized were happening in the picture.

Ask students (to support students' thinking):

- What did you visualize moving?
- Why do you think it was moving? What do you think made it move?
- Can you show us the movement with your body?

On-the-Fly Assessment 1:

Students' Initial Use of Visualizing Scientific Phenomena

Look for: The focal comprehension strategy in this unit is visualizing by using information read or seen in books. As students are talking about the movements they visualize based on the projected images, listen for and make note of individual students or partners who are attending to particular elements in an image and using talk or gestures to describe how they imagine the elements moving. For example, a student might say something such as "I think the cow is pulling the wagon and making the wagon move on the road. The cow's legs look like the cow is taking a step. The way we can answer our investigation question is to visualize, which means to make a picture or movie in our minds."

4. Project tow truck image. Think aloud about how to use the visualizing strategy. Explain that what is shown is just a picture, and that nothing is moving. You will need to imagine the movement in order to better understand what is happening in the

[Scroll for more](#)

On The Fly Assessment

Lesson 1.2

Chapter 1: How do we make a pinball start to move? ⓘ



Lesson 1.2: About Forces

- 2 STUDENT-TO-STUDENT DISCUSSION Visualizing Movement
- 3 TEACHER-LED DISCUSSION Explaining with Because
- 4 READING Reading: Talking About Forces

Visualizing Movement

Students look at a slideshow of images to visualize several types of movement and then discuss what made the objects start to move. (10 min)



INSTRUCTIONAL GUIDE

On-the-Fly

Assessment 1:
Students' Initial Use
of Visualizing

ON THE FLY ASSESSMENT

Digital Resources

- Classroom Slides 1.2 | PowerPoint
- Classroom Slides 1.2 | Google Slides
- All Projections
- Class Pinball Machine Preparation: Lesson 1.2
- Explanation Language Frame: Lesson 1.2

talk about forces using their own words. First, they play a game of Pinball, which involves moving a ball across the board by hitting it with a mallet. Next, they examine a slideshow of images showing objects starting to move, visualizing the forces that caused the movement. Students practice using the word *because* to explain the forces that caused the movement. This activity serves as an introduction to the concept of Cause and Effect. They then read and discuss the first book in the unit, *Talking About Forces*. This book focuses on the concept of forces.

Embedded Formative Assessment

On-the-Fly, Lesson 1.2

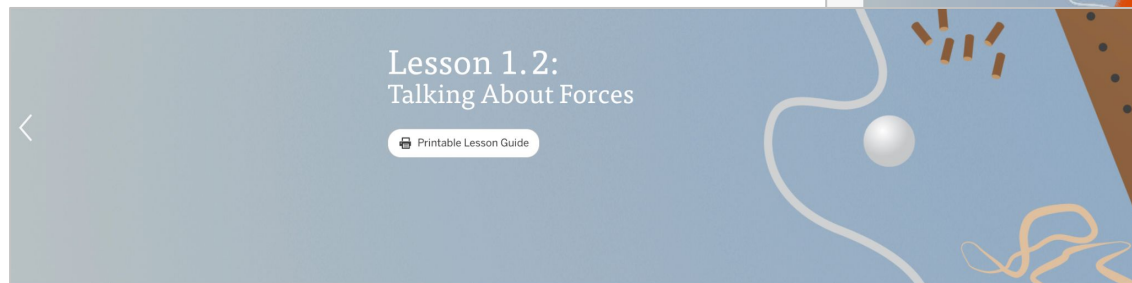


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Now what? As you reflect on the activity with the class, repeat one or two accurate examples of visualizing that you noticed in students’ talk. Highlight the way that students took what could be seen in the images and then went beyond it in describing movement. For example, you might say something such as “I noticed Rosa’s example of visualizing with this picture. She noticed how the cow’s legs were forward and imagined the cow taking a step. She saw that the cow is hitched to the wagon, so she imagined the wagon rolling forward on its wheels as the cow walked. Good visualizing takes what is in a picture or words and uses those things to imagine something more.” If students generally had difficulty visualizing, pick another image and model visualizing particular movement based on specific elements in the image.

Classroom slides

Lesson 1.4



Lesson 1.2: Talking About Forces

 Printable Lesson Guide


Lesson Brief
(4 Activities)

1 HANDS-ON
Exploring and Describing
Movement

2 STUDENT-TO-STUDENT
DISCUSSION
Visualizing Movement

3 TEACHER-LED DISCUSSION
Explaining with Because

4 READING
Reading: Talking About
Forces

 RESET LESSON

Overview

Materials & Preparation

Differentiation






Standards

Vocabulary

Overview

Students begin to talk about forces using their own words. First, they play a game called Rugball, which involves moving a ball across the carpet and describing its movement. Next, they examine a slideshow featuring images of objects starting to move, visualizing the movement of the objects. Students practice using the word *because* to explain a variety of everyday events, which serves as an introduction to the crosscutting concept of Cause and Effect. They listen to this language again and practice using the visualizing strategy as the teacher reads aloud the first book in the unit, *Talking About Forces*. This book allows students to practice the language

Digital Resources

-  Classroom Slides 1.2 | PowerPoint
-  Classroom Slides 1.2 | Google Slides
-  Links
-  Class Pinball Machine Preparation: Lesson 1.2
-  Explanation Language Frame: Lesson 1.2

English

Español

Chapter 1: How do we make a pinball start to move? ⓘ



LESSON 1.2 Talking About Forces



LESSON 1.3 Forces Happen Between Two Objects



LESSON 1.5 Writing About Forces

Engineers work together to learn more about the things they study.



As you look at the pictures share your ideas with your partner and talk about how to answer this question: **What movements did you visualize in the picture?**





Teacher action:

Assign pairs of students. Allow students time to share with their partners using your typical partner-share routine. Circulate and monitor how students are making sense of the movements that they visualized were happening in the picture.

Ask students (to support students' thinking):

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On-the-Fly Assessment 1:

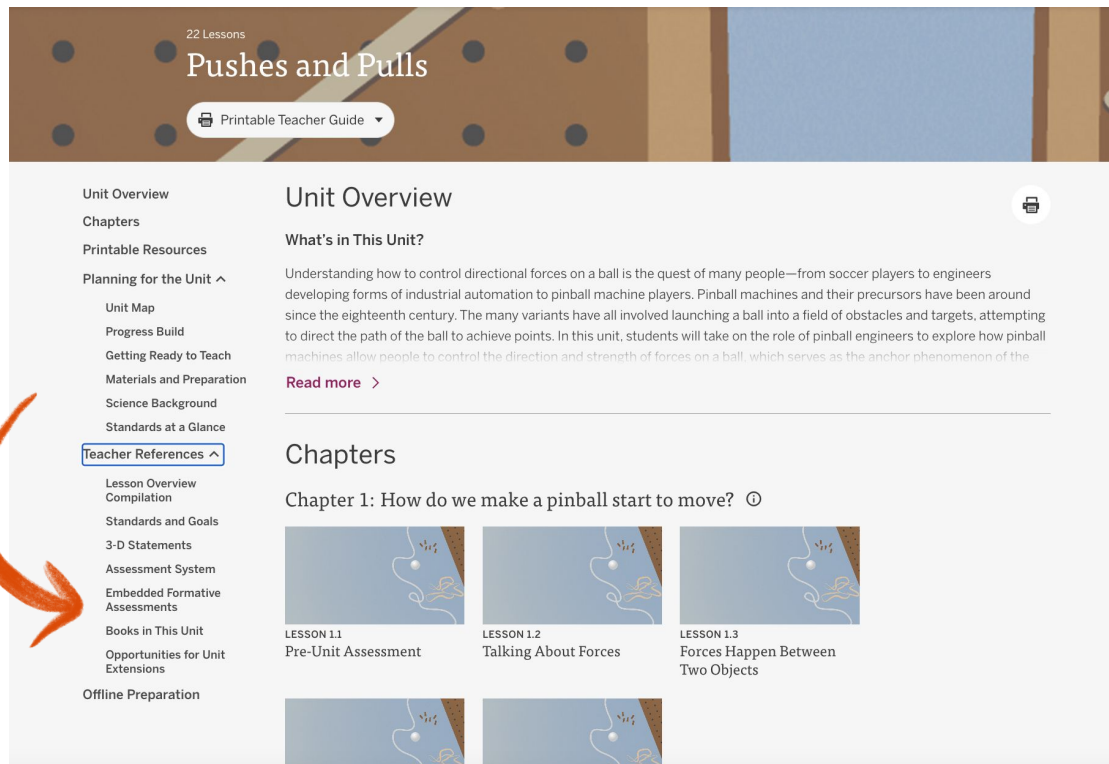
Students' Initial Use of Visualizing Scientific Phenomena

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On the Fly Assessment

Work time

- Explore the On-the- Fly Assessments



22 Lessons

Pushes and Pulls

Printable Teacher Guide

Unit Overview

What's in This Unit?

Understanding how to control directional forces on a ball is the quest of many people—from soccer players to engineers developing forms of industrial automation to pinball machine players. Pinball machines and their precursors have been around since the eighteenth century. The many variants have all involved launching a ball into a field of obstacles and targets, attempting to direct the path of the ball to achieve points. In this unit, students will take on the role of pinball engineers to explore how pinball machines allow people to control the direction and strength of forces on a ball, which serves as the anchor phenomenon of the

[Read more >](#)

Chapters

Chapter 1: How do we make a pinball start to move? ⓘ

LESSON 1.1
Pre-Unit Assessment

LESSON 1.2
Talking About Forces

LESSON 1.3
Forces Happen Between Two Objects

Unit Overview

Chapters

Printable Resources

Planning for the Unit ^

- 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
- Opportunities for Unit Extensions

Offline Preparation

Example assessment (On-the-Fly, Lesson 1.4)

Reflection

- What **data** can a teacher collect from this activity?
- What can a teacher **do** with this information?

Lesson 1.2: Talking About Forces

Activity 2

Engineers work together to learn more about the things they study.



As you look at the pictures share your ideas with your partner and talk about how to answer this question: **What movements did you visualize in the picture?**



Formative assessment information

Possible student responses

- Within assessments:
 - “Look fors” (OtF)
 - “Assess Understanding” (CJ)
- Possible responses within the Instructional Guide
- Digital resources
 - Assessment Guides
 - Teacher References

Drawing Diagrams of Our Box Models

Students are introduced to the *Pushes and Pulls* Investigation Notebook and draw a diagram to record their solutions from their Box Models. (15 min)

EMBEDDED FORMATIVE ASSESSMENT INSTRUCTIONAL GUIDE

Step-by-step Teacher Support Possible Responses My Notes

Name: _____ Date: _____

**Box Model Diagram:
Drawing the Launcher**

Directions:

1. Draw the launcher in orange.
2. Draw the ball.
3. Draw how the ball moved.

Collecting formative assessment data

Create a system that's easy for you to use.

Grade :

Lesson

Look for 1:

Look for 2:

[illegible]

K-1 Clipboard Assessment Tool

The Clipboard Assessment Tool offers a support for collecting data for the On-the-Fly and Critical Juncture Assessments that align to each Progress Build level in the unit.

Chapter 3: Clipboard Assessment Tool

x = incorrect
✓ = correct

Progress Build Level 2: The longer that sunlight shines on the surface, the warmer it gets.

| Question to ask students | Students who understand... |
|---|--|
| Lesson 3.3, Activity 4: Why is the playground surface warmer in the afternoon than it was in the morning? | should say that it is warmer because <u>sunlight has been shining on it for a long or longer time</u> (than in the morning). |
| Lesson 3.4, Activity 1: Has the sunlight been shining on the rock for a longer time in this picture than in the other one, or for a shorter time? | should walk to the <u>shorter</u> yard if the picture shows the surface when it is cooler than in the other picture, or walk to the <u>longer</u> yard if the picture shows the surface when it is warmer than in the other picture. |
| Lesson 3.4, Activity 2: Walk to the time of day when: • ① the surface is cold. • ② the surface is warm. • ③ the surface is hot. • ④ sunlight is not shining on the surface. • ⑤ sunlight has been shining on the surface for a long time. • ⑥ sunlight has been shining on the surface for a short time. | <p>① should walk to <u>nighttime</u>. ② should walk to <u>morning</u>. ③ should walk to <u>afternoon</u>. ④ should walk to <u>nighttime</u>.</p> <p>⑤ should walk to <u>afternoon</u>. ⑥ should walk to <u>morning</u>.</p> <p>M = Morning A = Afternoon N = Nighttime</p> |

3 Images
1. Lizard (L)
2. Feet (F)
3. Chocolate (C)

| Student's name | Notes | * CJ * 2 | |
|----------------|-----------------------------------|-------------------------|---------------------------------------|
| | | Lesson 3.4, Act 1 | Lesson 3.4, Act 2 |
| Student A | "There are no clouds in the sky." | L = x F = x C = x | ① x M ④ x M ② x N ⑤ x N ③ ✓ ⑥ ✓ |
| Student B | "Because kids played on it." | L = x F = x C = x | ① x M ④ ✓ ② x N ⑤ x N ③ ✓ ⑥ ✓ |
| Student C | | L = ✓ F = x C = ✓ | ① ✓ ④ ✓ ② x A ⑤ ✓ ③ ✓ ⑥ ✓ |

Additional formative assessment information

On-the-Fly Assessments

In addition to assessing concepts in the Progress Build, some On-the-Fly Assessments provide data about:

- Science and Engineering Practices
- Crosscutting Concepts
- Literacy skills
- Student collaboration



NGSS connection: This formative assessment reveals student knowledge and use of Disciplinary Core Ideas PS2.A: Forces and Motion (PS2.A-P2: Pushing or pulling on an object can change . . . its motion and can start or stop it) and PS2.B: Types of Interactions (PS2.B-P1: When objects touch or collide, they push on one another and can change motion) and the Crosscutting Concept of Cause and Effect (CE-P2: Events have causes that generate observable patterns.).

Additional 3-D Assessment Opportunities

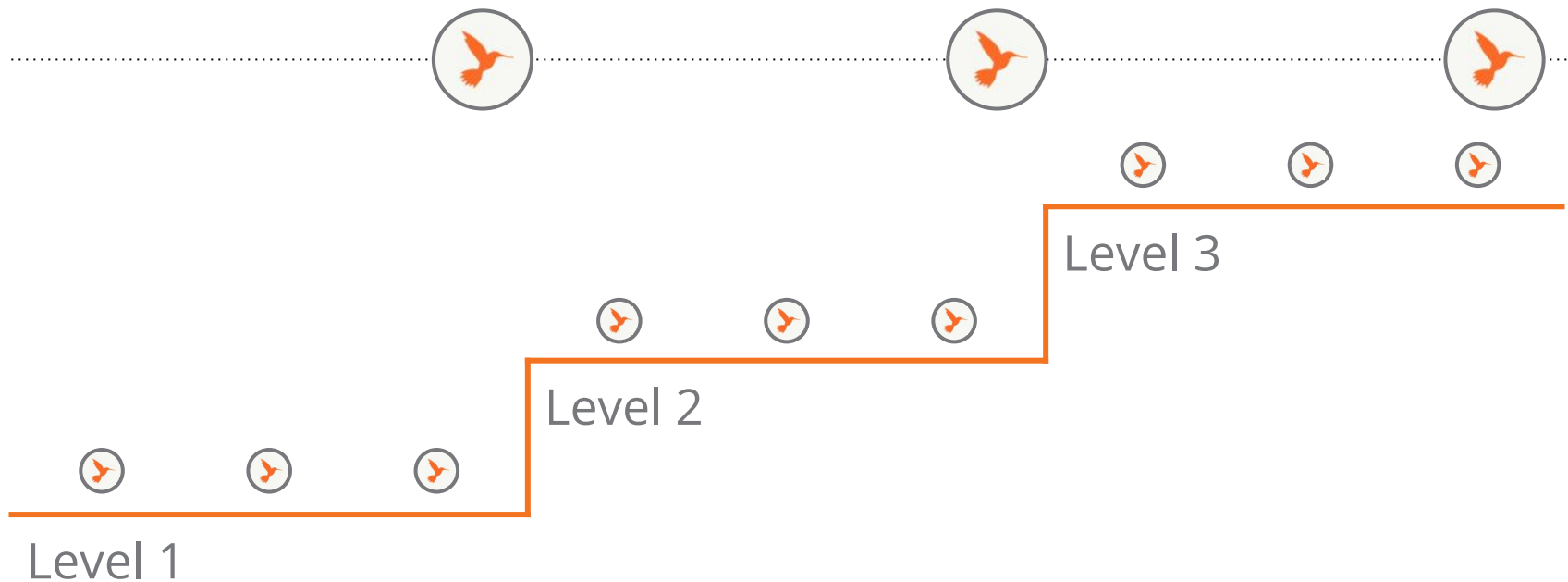
To assess students on the practice of Developing and Using Models (SEP 2), as you ask students about their Box Model diagrams look to see that students are representing the launcher, the ball, and the movement of the ball in a way that is consistent with their oral descriptions. Students should be developing models that represent the pattern of how the balls moved relative to the launcher in their Box Models.

See the *Pushes and Pulls* Crosscutting Concept Tracker (in Digital Resources for Lesson 1.1) to track student progress across the unit with the crosscutting concept of Cause and Effect, and for prompts that can be used to elicit further evidence of student understanding of the crosscutting concept.

Questions?

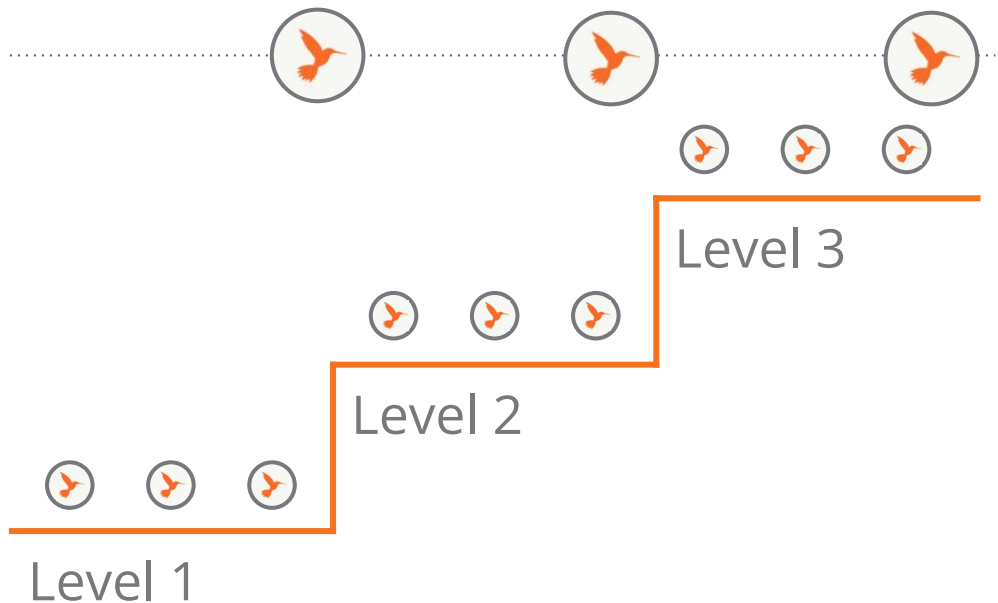


Critical Juncture Assessments

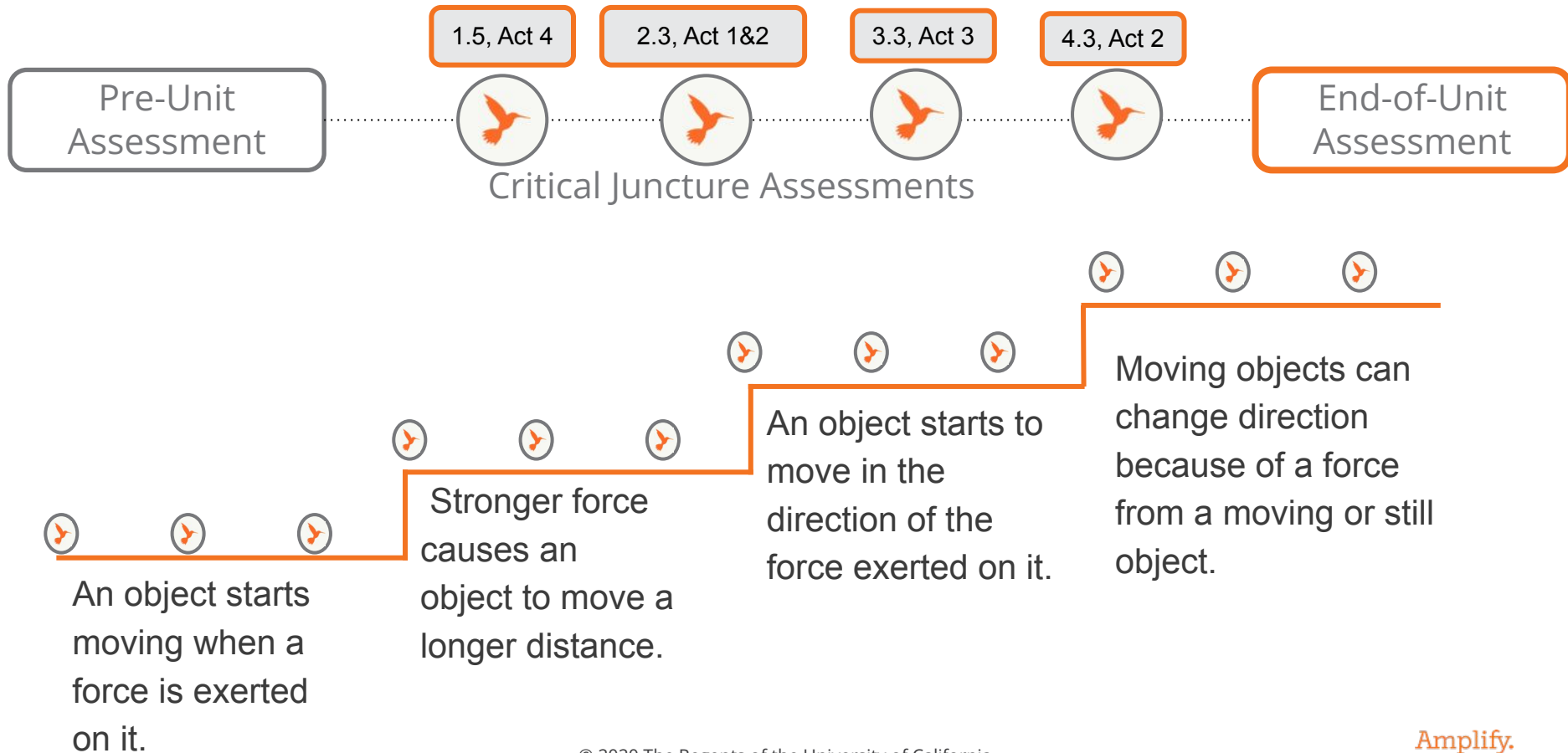


Critical Juncture Assessments

- Track student progress between Progress Build levels
- Embedded into instruction
- Assessment resource includes “Assess Understanding” and “Tailor Instruction”



K-5 Assessment System



Critical Juncture Assessment

Lesson 1.5, Activity 4

Revisiting Talking About Forces

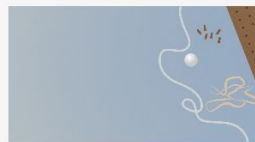
Students reread *Talking about Forces* to talk about how forces are happening between pairs of objects in the pictures. (15 min)



Critical Juncture
Assessment 1:
Students'
Understanding of
Movement as Caused
By a Force

CRITICAL JUNCTURE

Chapter 1: How do we make a pinball start to move? ⓘ



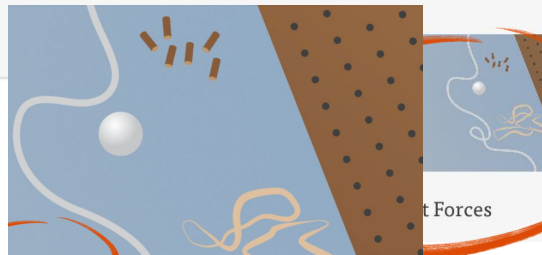
LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Talking About Forces



LESSON 1.3
Forces Happen Between
Two Objects



About ⓘ

Digital Resources

- Classroom Slides 1.5 | PowerPoint
- Classroom Slides 1.5 | Google Slides
- Class Pinball Machine Preparation: Lesson 1.5
- Shared Writing: Lesson 1.5
- What Engineers Do Chart: Completed

Differentiation
Standards
Vocabulary

so far in the context of engineering practices, including how they have engaged in the design cycle and made explanations. First, students continue learning about how engineers work as they revisit the What Engineers Do chart. Then, they share the solutions they designed in their Box Models and add a launcher to the Class Pinball Machine. Students use their ideas to contribute to a class explanation of why their pinball started to move and then end the lesson by reading and talking about *Classroom Slides 1.5: Forces*.

Embedded Formative Assessment

Critical Juncture Lesson 1.5



Critical Juncture Assessment: Students read and discuss. While students are working, circulate and monitor how they talk about the objects in the pictures. Listen for whether they accurately describe objects as starting to move because another object exerted a force on it. As you see opportunities, probe students' thinking with additional questions:

What is the object that started to move in this picture?

[The worm.]

Why did it start to move?

[The worm moved because the bird exerted a force on it. The worm moved because it was pulled.]

Critical Juncture Assessment

Lesson 1.9, Activity 2

Chapter 1: How do we make a pinball start to move? ⓘ

Lesson 1.5: Writing About Forces

Printable Lesson Guide

1 TEACHER-LED DISCUSSION
Engineers Design Solutions

2 TEACHER-LED DISCUSSION
Adding a Launcher to the Class Pinball Machine

3 WRITING
Writing About Forces

4 READING
Revisiting Talking About Forces

RESET LESSON

Overview
Materials & Preparation
Differentiation
Standards
Vocabulary

Overview

Students situate the learning and designing they've done in the unit so far in the context of engineering practices, including how they have engaged in the design cycle and made explanations. First, students continue learning about how engineers work as they revisit the What Engineers Do chart. Then, they share the solutions they designed in their Box Models and add a launcher to the Class Pinball Machine. Students use their ideas to contribute to a class explanation of why their pinball started to move and then end the lesson by reading and talking about Forces About Forces.

Digital Resources

- Classroom Slides 1.5 | PowerPoint
- Classroom Slides 1.5 | Google Slides
- Class Pinball Machine Preparation: Lesson 1.5
- Shared Writing: Lesson 1.5
- What Engineers Do Chart: Completed

LESSON 1.2
Talking About Forces

LESSON 1.3
Forces Happen Between Two Objects

LESSON 1.5
Writing About Forces

Partner Reading



1.

Sit **next to** your partner.



2.

Put the **book between** you.



3.

Work together to read and understand.





objects as starting to move because another object exerted a force on it. As you see opportunities, probe students' thinking with additional questions, as in the example below:



Ask students:

- What is the object that started to move in this picture?
- Why did it start to move?



Students may respond:

- The worm.
- The worm moved because the bird exerted a force on it. The worm moved because it was pulled.

Critical Juncture Assessment 1:

Students' Understanding of Movement as Caused By a Force

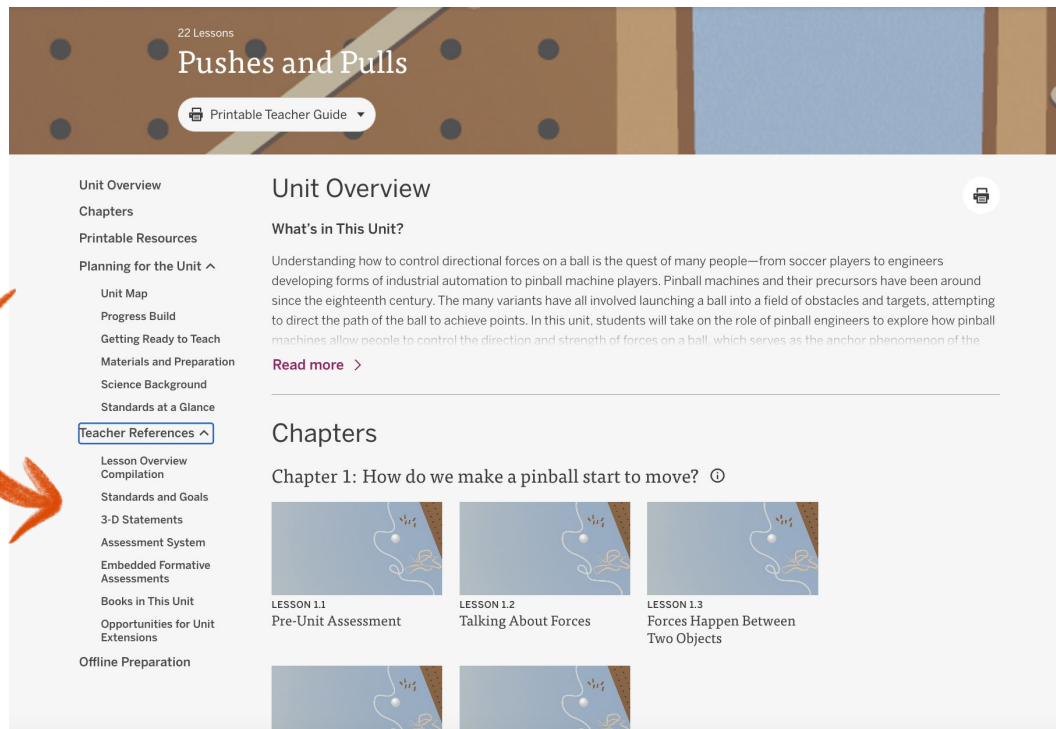
Assess understanding: Questioning students as they talk is an additional opportunity for you to assess their understanding that an object starts moving because a force was exerted on it by another object. The questions included with the Chapter 1: Clipboard Assessment Tool for this lesson ("What is the object that started to move in the picture? Why did it start to move?") are available as a reference. There is also a space to record notes about several students' responses. In general, students who understand these ideas should be able to explain that the moving object in the picture started to move because the other object exerted a force on it.

Tailor Instruction: Review your notes about students' responses from this activity and from On-the-Fly Assessment 3 in Lesson 1.4. If many of your students are not showing evidence of understanding that an object starts moving because a force was exerted on it by another object, we recommend offering additional instruction in Lesson 2.1. In the first activity of Lesson 2.1, you can take time for more focused instruction by using the objects from the Investigating Forces activity in Lesson 1.3. You can create three or four stations, each featuring a pair of objects where one is used to move the other. (See the Augmenting Instruction: Differentiating in Response to Critical Juncture Assessment 1 note in the Teacher Support tab in that activity for details.) If a smaller number of your students are not showing evidence of understanding those ideas, you can lead a similar discussion with just those students, before or during Lesson 2.1.

Formative Assessments

Work time

- Explore the Critical Juncture Assessments



The screenshot shows the unit overview for 'Pushes and Pulls' in the Amplify Science curriculum. The header indicates '22 Lessons'. A 'Printable Teacher Guide' button is visible. The left sidebar contains a navigation menu with categories: Unit Overview, Chapters, Printable Resources, Planning for the Unit (with a dropdown arrow), and Teacher References (with an up arrow). Under 'Planning for the Unit', the 'Teacher References' link is highlighted with a blue box. An orange arrow points from this box to the 'Embedded Formative Assessments' link in the 'Teacher References' section. The main content area shows the 'Unit Overview' with a 'What's in This Unit?' section containing a paragraph about pinball machines and a 'Read more' link. Below this is the 'Chapters' section, starting with 'Chapter 1: How do we make a pinball start to move?'. Three lesson cards are displayed: 'LESSON 1.1 Pre-Unit Assessment', 'LESSON 1.2 Talking About Forces', and 'LESSON 1.3 Forces Happen Between Two Objects'. Each card features a pinball machine illustration.

22 Lessons

Pushes and Pulls

Printable Teacher Guide

Unit Overview

Chapters

Printable Resources

Planning for the Unit ^

- 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

Opportunities for Unit Extensions

Offline Preparation

Unit Overview

What's in This Unit?

Understanding how to control directional forces on a ball is the quest of many people—from soccer players to engineers developing forms of industrial automation to pinball machine players. Pinball machines and their precursors have been around since the eighteenth century. The many variants have all involved launching a ball into a field of obstacles and targets, attempting to direct the path of the ball to achieve points. In this unit, students will take on the role of pinball engineers to explore how pinball machines allow people to control the direction and strength of forces on a ball, which serves as the anchor phenomenon of the

[Read more >](#)

Chapters

Chapter 1: How do we make a pinball start to move? ⓘ

LESSON 1.1
Pre-Unit Assessment

LESSON 1.2
Talking About Forces

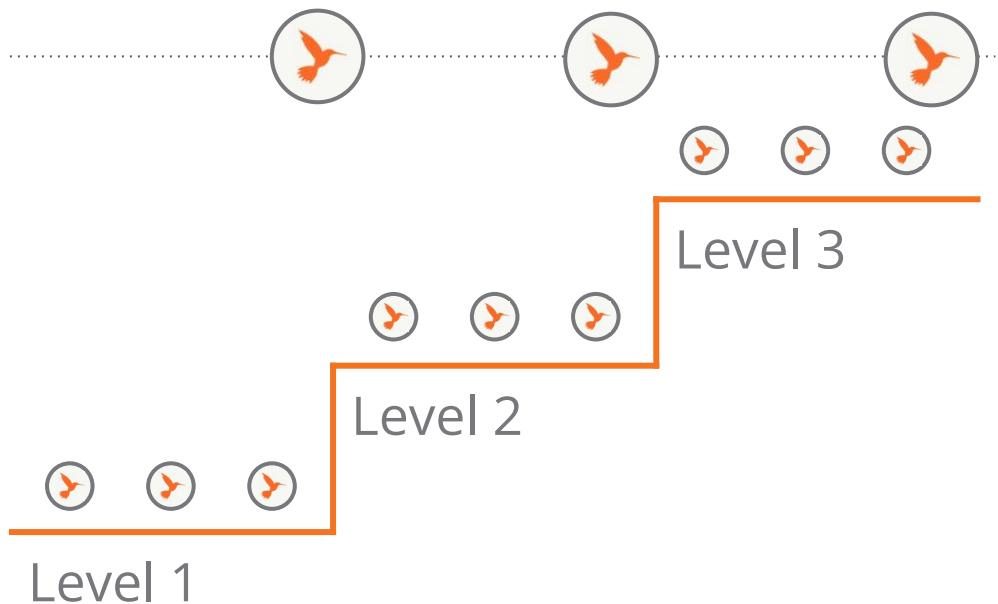
LESSON 1.3
Forces Happen Between Two Objects

Embedded formative assessments

Reflection

In 1-2 sentences, describe the relationship among:

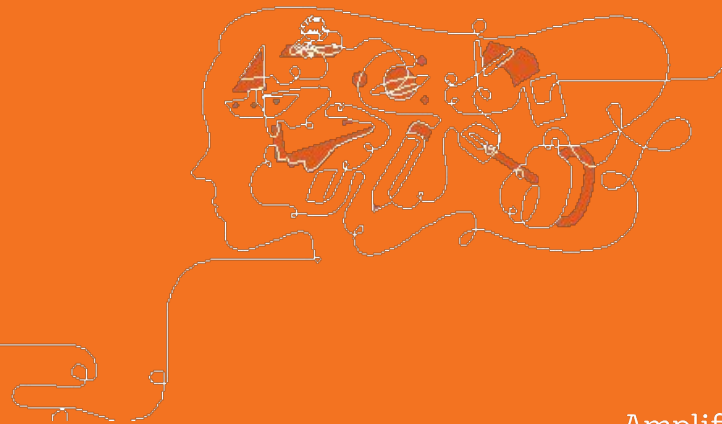
- Progress Build
- On-the-Fly Assessments
- Critical Juncture Assessments



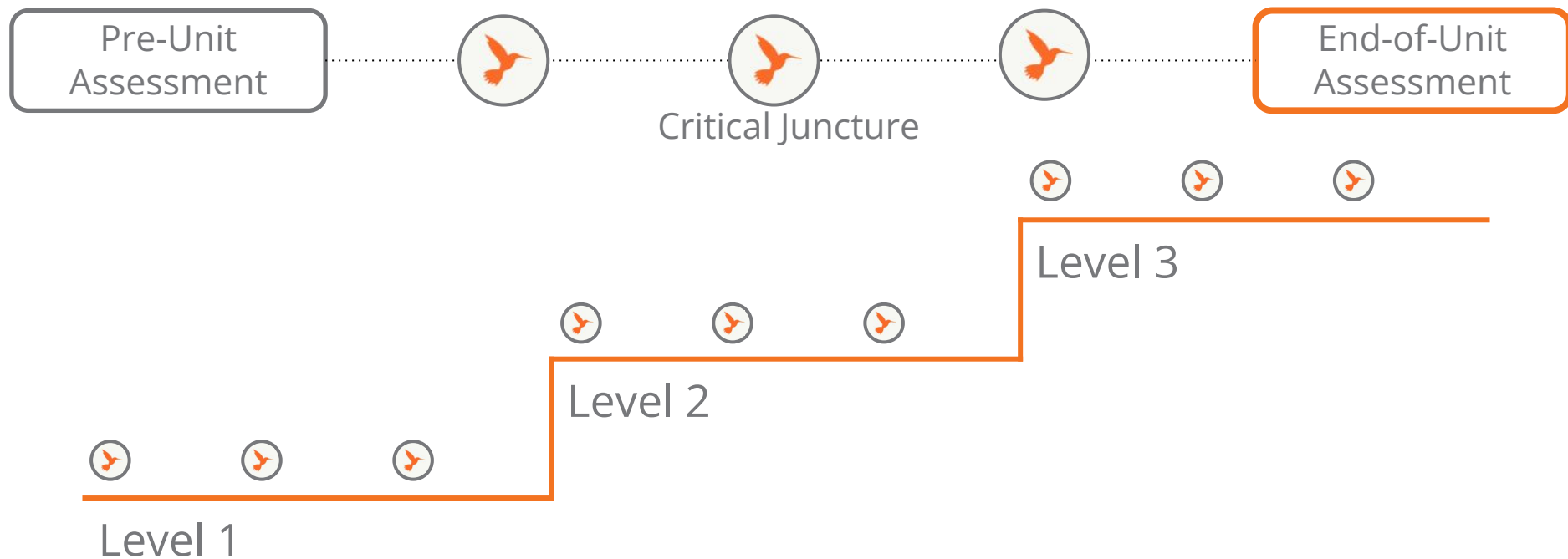
Questions?



End-of-Unit Assessment



K-5 Assessment System



End-of-Unit Assessment

3-dimensional assessment opportunity

- Summative assessment of mastery of science concepts
- Formative assessment of Science and Engineering Practices



Lesson Review Prior to the End of Unit Assessment

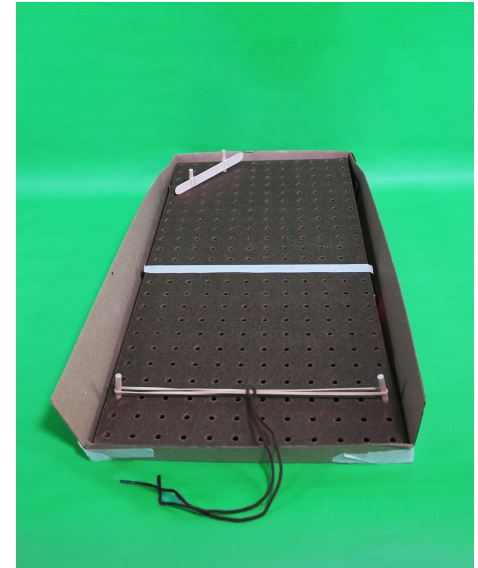
Lesson 6.2

- Students discuss how objects they observed in the School Forces Tour provide evidence of different kinds of forces being exerted.
- They participate in a Shared Reading of *A Busy Day in Pushville*, which provides opportunities for them to describe the forces shown in the book in terms of strength and direction
- Students go on a gallery walk to review artifacts and learning activities from each chapter, and partners discuss what they learned.

End of Unit Assessments

What are students being asked to do?

Students will talk to the teacher about the **forces that are making the ball move.**



3 Dimensional Learning

Assessment Guide

The assessment task in this lesson provides guidance for assessing student understanding of the following standards:

Science and Engineering Practice

- Practice 7: Engaging in Argument from Evidence
 - ARG-P6: Construct an argument with evidence to support a claim

Disciplinary Core Ideas

- PS2.A: Forces and Motion:
 - PS2.A-P1: Pushes and pulls can have different strengths and directions. (K-PS2-1, K-PS2-2)
 - PS2.A-P2: Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1, K-PS2-2)
- PS2.B: Types of Interactions:
 - PS2.B-P1: When objects touch or collide, they push on one another and can change motion. (K-PS2-1)
- PS3.C: Relationship Between Energy and Forces:
 - PS3.C-P1: A bigger push or pull makes things speed up or slow down more quickly. (K-PS3.C)
- ETS1.A: Defining and Delimiting Engineering Problems:
 - ETS1.A-P2: Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)

Crosscutting Concept

- Cause and Effect
 - CE-P2: Events have causes that generate observable patterns.

End of Unit Assessment Rubric

Rubrics 2 and 3

Rubrics 2 and 3 focus on students' explicit understanding of the crosscutting concept of Cause and Effect and their use of a science and engineering practice (supporting an answer with evidence), respectively. Given that students' understanding of crosscutting concepts and their dexterity with science practices develop through regular opportunities across multiple units, mastery is outside the scope of a single unit. Therefore, these two rubrics are intended to be used formatively to guide teacher feedback and future instruction rather than to produce a score or a grade.

Rubric 2: Assessing Students' Understanding of the Crosscutting Concept of Cause and Effect

Rubric 2 focuses on students' descriptions and identifications of an example of cause and effect (in the context of the pinball machine), which is a unifying concept in science and engineering.

Rubric 2: Assessing Students' Understanding of the Crosscutting Concept of Cause and Effect

Did the student describe an appropriate example of cause and effect and explicitly identify both cause and effect accurately?

- Did the student provide an appropriate example of cause and effect from the Class Pinball Machine? (For example, did the student indicate the effect as the observed movement of the ball and the cause as the force exerted on the ball?)
- Did the student explicitly identify the cause and the effect in his/her example?

Rubric 3: Assessing Students' Understanding of the Practice of Supporting an Answer with Evidence

Rubric 3 focuses on students' descriptions of appropriate observations as evidence of the nature of the force exerted.

Rubric 3: Assessing Students' Understanding of the Practice of Supporting an Answer with Evidence

Did the student describe the movement of the pinball when asked to describe the evidence for his/her response?

- Did the student describe the long distance traveled by the ball as evidence that a stronger force was exerted on it?
- If the student did not know what to provide when explicitly asked for evidence, did he/she describe the long distance traveled as what he/she saw that led to his/her answer?

Possible Accurate Student Responses

Relevant to each rubric, possible student responses are provided to illustrate an accurate response to each question.

Possible Accurate Student Responses

Science Content: Forces and Motion

- We have learned a lot about how different kinds of forces make things, like the pinball, move in different ways. I am going to make the pinball move in our Class Pinball Machine. Talk to me about the different forces that made the ball move like it did.
- The first time, the pinball moved a short distance toward this side of the machine because the launcher exerted a gentle force on the ball toward this side.
- The second time, the pinball moved a long distance toward that side of the machine because the launcher exerted a strong force in that direction. The ball changed direction because the bumper exerted a force on the ball when the ball hit the bumper.

Responses to follow-up questions

If the student does not mention the force from the bumper:

- Were there any forces exerted on the ball after I launched it the second time? Why do you think so?

Yes, the bumper exerted a force on the ball. I think so because the ball changed direction.

If the student does not mention the direction of forces:

- Why did the ball move in this direction when I pulled the launcher and in that direction after the ball hit the bumper?

The launcher exerted a force on the ball. When the ball hit the bumper, the bumper exerted a force on the ball and made it change direction.

If the student does not mention the strength of forces:

- Why did the ball move only a short distance the first time but a long distance the second time?

The first time, the launcher exerted a gentle force, so the ball only moved a short distance. The second time, the launcher exerted a strong force, so the ball moved a long distance, and then it hit the bumper.

Possible Accurate Student Responses

Crosscutting Concept: Cause and Effect

- As we have been learning about forces, we have been talking about cause and effect. Cause and effect means that one thing caused another thing to happen. Think about how the ball moved in the pinball machine. Can you describe an example of cause and effect?

The ball moved a long distance because the launcher exerted a strong force on it.

If the student has difficulty giving an example:

- Can you use the word because to explain what made the ball move the way it did?

The ball changed direction because the bumper exerted a force on it.

If the student still has difficulty giving an example, launch the pinball one more time and provide the following scaffolding:

- What caused the ball to move?

The launcher.

- What happened to the ball when the launcher hit it?

The ball started to move.

- How can we use the word because to explain what happened?

The ball started to move because the launcher hit it.

Science and Engineering Practice: Supporting an Answer with Evidence

- I launched the ball two times. Which time do you think the force was stronger—the first time or the second time?

The second time.

- What is your evidence that that force was stronger?

The ball went a longer distance.

If the student is not sure how to respond:

- What did you see that made you think the force was stronger?

The ball went a longer distance.

End-of-Unit Assessment

Work time

- Open your Participant Notebook to page 12.
- Read the rubrics.
- Read through the questions and the slide deck notes (teacher action).
- Add additional questions to the slides that will elicit the explanations needed.
- What will you have the other students doing while you are individually assessing students.
- Share out.

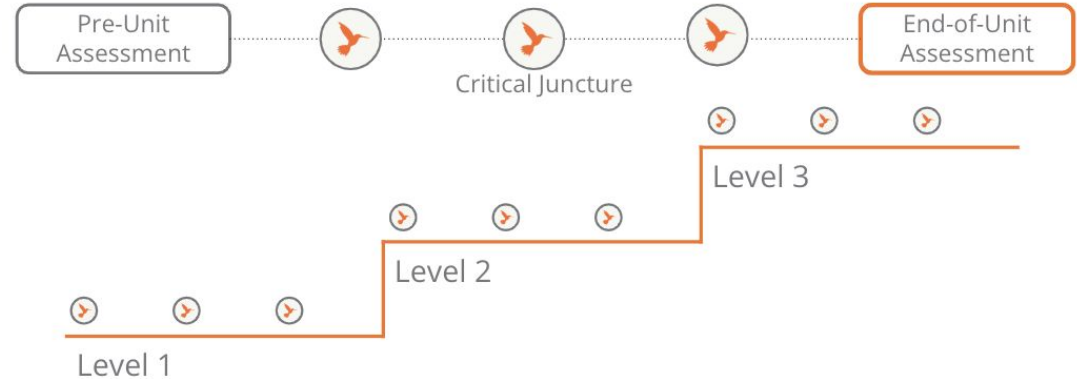


Assessment System

Reflection

How do the Progress Build and assessments work as a system?

What are the benefits of this system for students? For teachers?



Collecting formative assessment data

Create a system that's easy for you to use.

Grade :

Lesson _____

Look for 1:

Look for 2:

[illegible]

Questions?

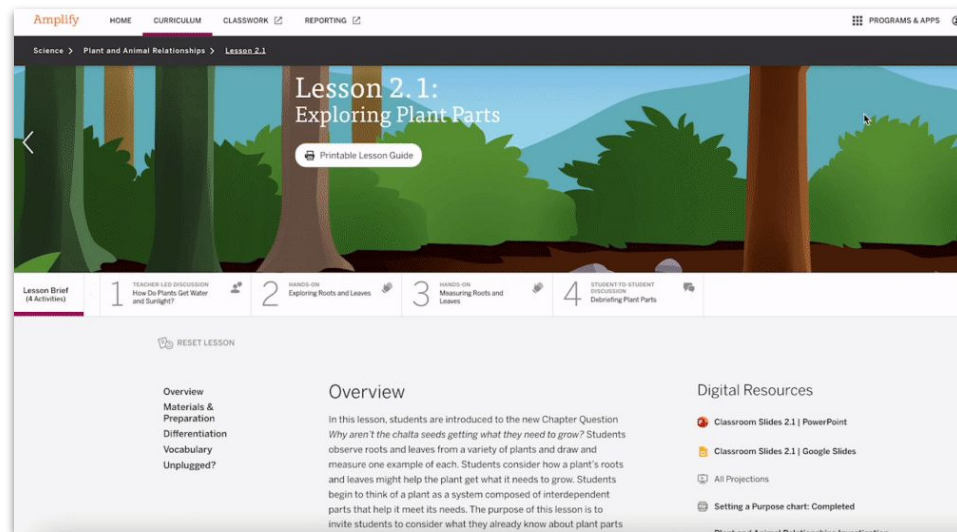


Lunch Break

Resources for NGSS progress monitoring

NGSS Benchmark assessments

- Accessible in the Global Navigation menu
- Grades 3-5
- 4 assessments per grade



Resources for NGSS progress monitoring

3D Assessment Objectives

- Located in the Unit Guide
- Identifies where each dimension of the target Performance Expectations are assessed in the unit, in the grade, or in the grade-band.

2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

SEP: Planning and Carrying Out Investigations

Needs of Plants and Animals (Grade K)

OTFA 7: Lesson 2.3, Activity 3
OTFA 10: Lesson 3.1, Activity 2

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
OTFA 4: Lesson 2.1, Activity 2

Sunlight and Weather (Grade K)
OTFA 2: Lesson 2.1 Activity 4
INV: Lesson 4.1, Activities 3 + 4 (S)
OTFA 14: Lesson 5.2, Activity 4

Light and Sound (Grade 1)
OTFA 2: Lesson 1.3, Activity 3
OTFA 7: Lesson 3.1, Activity 2
INV: Lesson 4.1, Activity 3 (S)

Spinning Earth (Grade 1)
OTFA 7: Lesson 3.1, Activity 2
OTFA 8: Lesson 3.3, Activity 4
OTFA 11: Lesson 4.1, Activity 2

Plant and Animal Relationships (Grade 2)
OTFA 4: Lesson 1.6, Activity 4
OTFA 9: Lesson 3.3, Activity 3
OTFA 12: Lesson 4.1, Activity 4
OTFA 13: Lesson 4.2, Activity 4
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
OTFA 14: Lesson 4.3, Activity 3

DCI: LS2.A: Interdependent Relationships in Ecosystems

Plant and Animal Relationships (Grade 2)

PRE: Lesson 1.1, Activity 3
CJ 1: Lesson 1.7 Activity 2
OTFA 7: Lesson 2.3, Activity 3
CJ 2a: Lesson 2.4, Activity 3
CJ 2b: Lesson 2.5, Activity 3
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
EOU: Lesson 4.4, Activity 3 (S)

CCC: Cause and Effect

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
EOU: Lesson 6.3, Activity 1 (S)

Sunlight and Weather (Grade K)
PRE: Lesson 1.3, Activity 4
OTFA 13: Lesson 4.4, Activity 1
EOU: Lesson 5.6, Activity 1 (S)

Animal and Plant Defenses (Grade 1)
OTFA 3: Lesson 1.4, Activity 3

Light and Sound (Grade 1)
PRE: Lesson 1.1, Activity 1
OTFA 3: Lesson 1.4, Activity 3
OTFA 9: Lesson 3.6, Activity 1
INV: Lesson 4.1, Activity 3 (S)
EOU: Lesson 4.6, Activity 1 (S)

Changing Landforms (Grade 2)
OTFA 5: Lesson 2.4, Activity 2

Properties of Materials (Grade 2)
OTFA 8: Lesson 2.3, Activity 5
OTFA 16: Lesson 4.3, Activity 4
EOU: Lesson 4.4, Activity 2 (S)

Generating grades

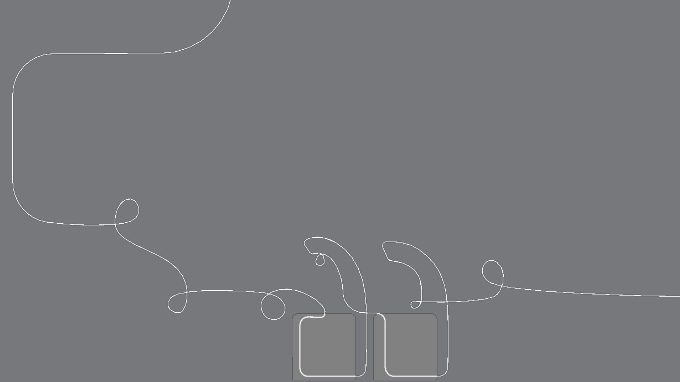
Group collaborative discussion

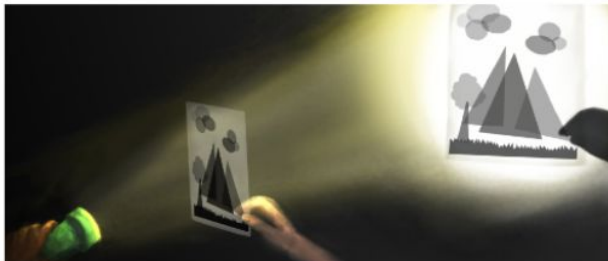
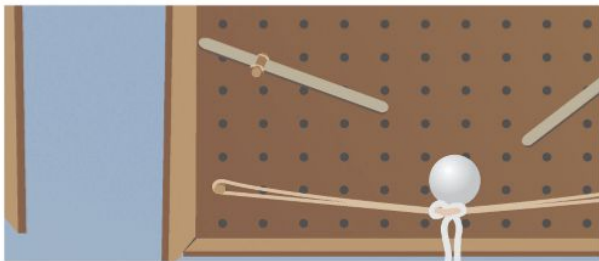
What are your district's grading requirements for science?

How will you use Amplify Science assessments to generate grades?



Questions?





Plan for the day

- Introduction
- Assessment System
- Progress Build
- Assessments
- **Model Lesson**
- Planning
- Closing

Pushes and Pulls

Problem: How can we create a pinball machine for our class?

Role: Pinball Engineers

Students use their new understanding of the phenomena of force and motion to identify pushes and pulls more broadly in their lives.

Coherent Storylines



How do we make a pinball start to move?



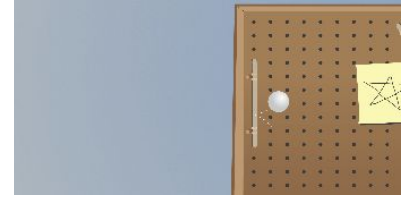
How do we make a pinball move as far as we want?



How do we make a pinball move to a certain place?



How do we make a moving pinball change direction?



How can we make the pinball machine do all the things we want it to do?

Coherence Flowchart

Chapter 1

Unit Design Problem

*Problem students
work to solve*

Chapter-level Anchor Phenomenon Chapter 1 Question

Investigation Questions

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to problem

Explanation that students can make to answer the Chapter 1 Question

Pushes and Pulls: Designing a Pinball Machine

We want to create a pinball machine that lets us control the way a pinball moves.
How can we create a pinball machine for our class?

Sometimes a pinball starts to move.
How do we make a pinball start to move?

What makes an object start to move? (1.1-1.4)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- Investigate how to make objects start to move in a classroom Movement Hunt (1.1)
- Investigate making an object start to move in full-class Rugby routine (1.2)
- Use recognizable images of objects moving to visualize movement (1.2)
- Practice using cause and effect to explain everyday scenarios (1.2)
- Read Talking About Forces (1.2)
- Investigate how to make an object move by exerting a force on it using Forces Investigation materials (1.3)
- Use Explanation Language Frame to explain forces and movement in Forces Investigation (1.3)

- An object starts to move when another object exerts a force on it. (1.3)
- Forces happen between two objects. (1.3)

- Design launchers to make a pinball start to move in individual student Box Models (1.4)
- Diagram Box Model launcher design (1.4)
- Add a launcher to make the pinball start to move in Class Pinball Machine (1.5)
- Shared Writing to explain the Chapter 1 Question (1.5)
- Revisit Talking About Forces to use Explanation Language Frame to explain how objects move in the text (1.5)

To make our pinball start to move, we must exert a force on the pinball. We can use a rubber band launcher to exert a force on the pinball.

Modeling Matter

Leading up to our
model lesson

Chapter 1: How do we make a pinball start to move? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Talking About Forces



LESSON 1.3
Forces Happen Between
Two Objects

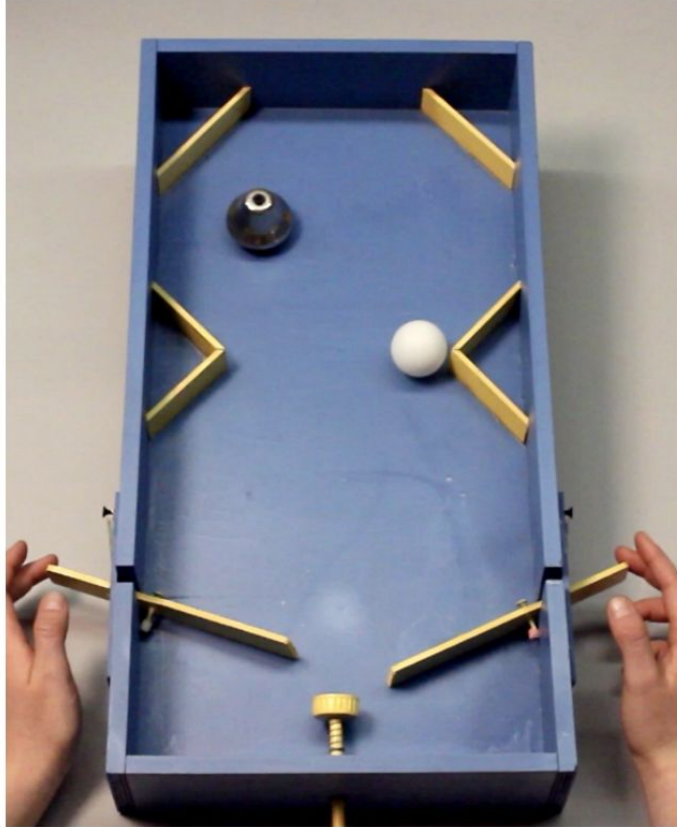


LESSON 1.4
We Are Engineers



LESSON 1.5
Writing About Forces

Lesson 1.1

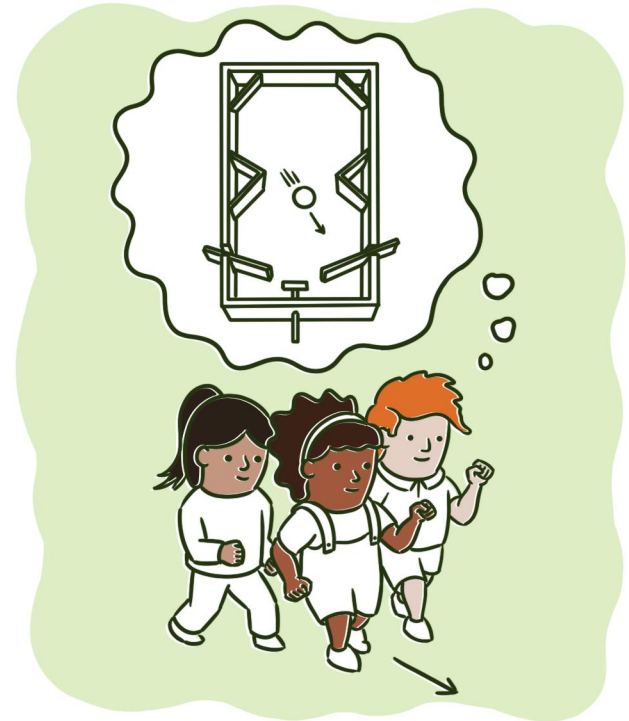


We will watch a video that shows **what pinball machines do.**

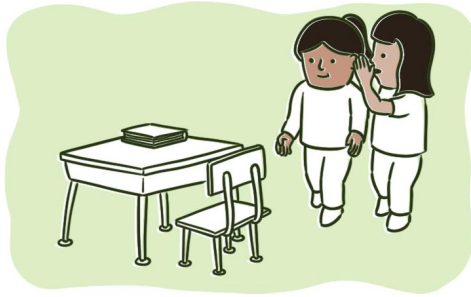
This will help us start thinking about how to make our pinball machine.

Using Our Bodies to Show How Pinballs Move

1.
Stand up so we can act out being a moving pinball in a pinball machine.
2.
Move to the left! Move to the right! Move forward!
Move to the back!
3.
Take a seat.



Movement Hunt



1.

Walk and whisper as you find objects you can move.



2.

Use only your hands.
Make sure you are moving objects and not touching your classmates.



3.

Clean up! After you make an object start to move, put it back where you found it.

We are trying to figure out what makes an object **start to move**.

During the **Movement Hunt**, we made many objects start to move.

Investigation Question:

What makes an object start to move?

Modeling Matter

Lesson 1.2

Students will :

- *Investigate making an object start to move in full-class Rugby routine*
- *Use recognizable images of objects moving to visualize movement*
- *Practice using cause and effect to explain everyday scenarios*
- *Read Talking About Forces*

Chapter 1: How do we make a pinball start to move? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Talking About Forces



LESSON 1.3
Forces Happen Between
Two Objects



LESSON 1.4
We Are Engineers

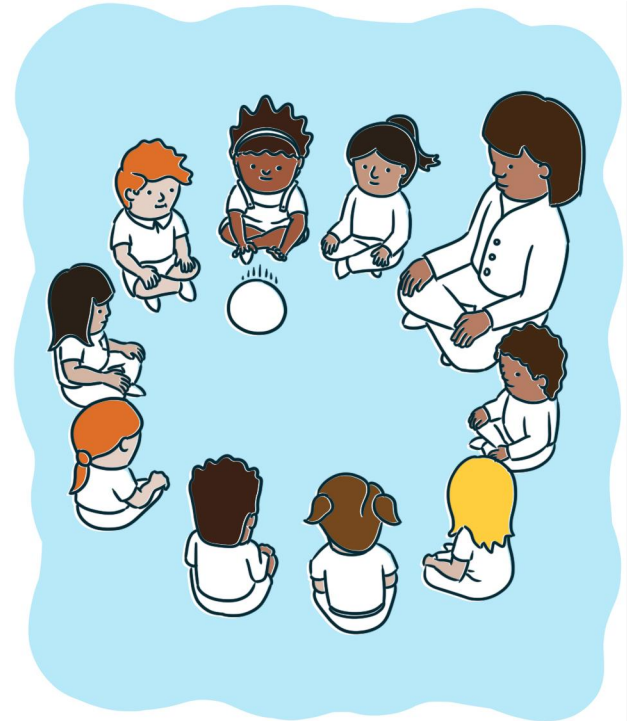


LESSON 1.5
Writing About Forces

Playing Rugbyball: Introduction

We are trying to start moving the ball.

1.
Sit in a circle so everyone can see.
2.
Start the ball moving with a push—not a throw or a kick.
3.
Keep the ball in the circle. If the ball goes outside the circle, wait for the teacher to ask a student to get it.



I will show you some more pictures. For each one, **visualize** what is happening.

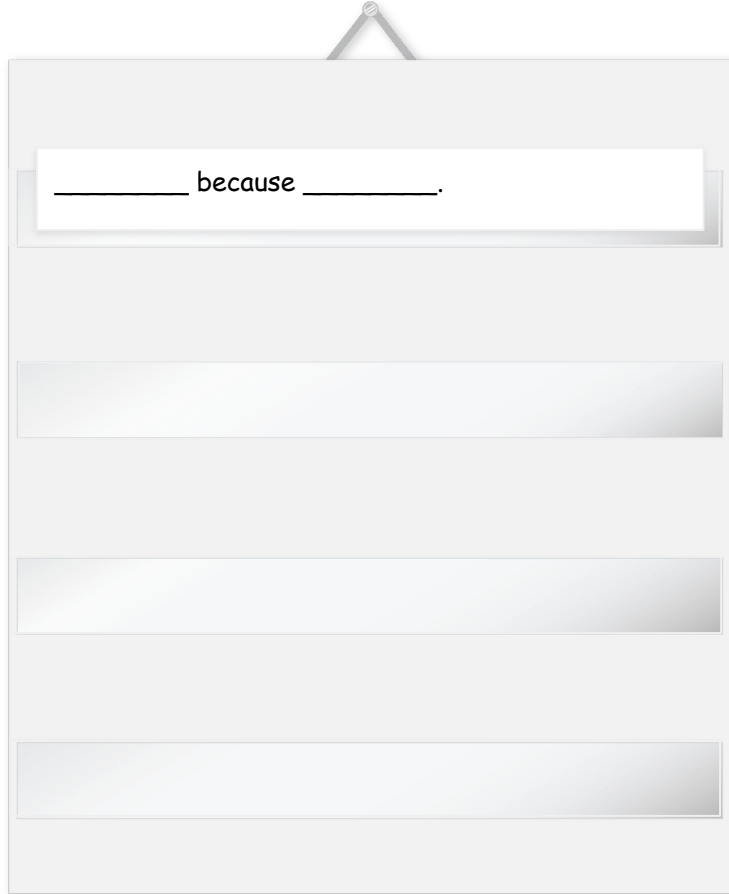
Think about **what is moving**, and **what is making that object move**.

You can also **act out** what is happening with your body.





I am going to **stand on one foot**. Watch my movements carefully.

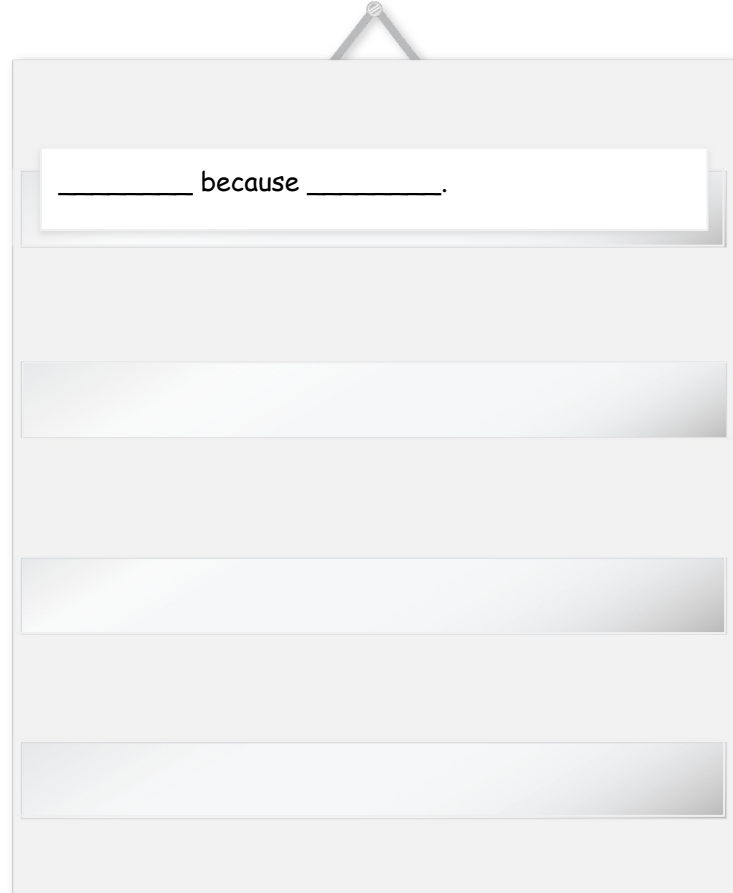


_____ because _____.

We can explain what happened and why with “because.”



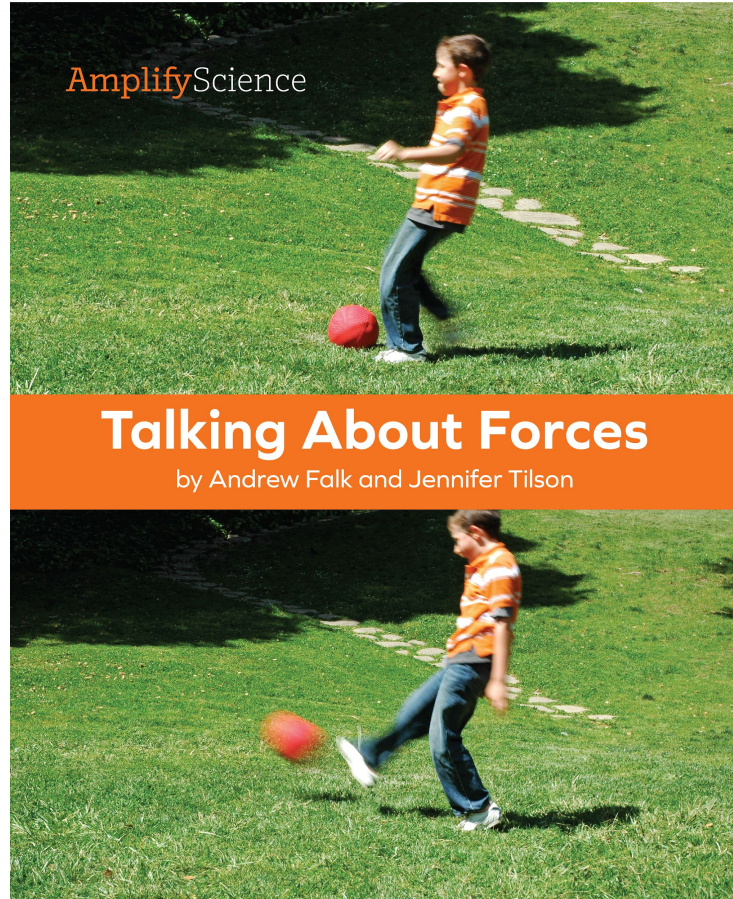
What happened when I tried to **balance**?



_____ because _____.

I tipped over **because** I stood on one foot.

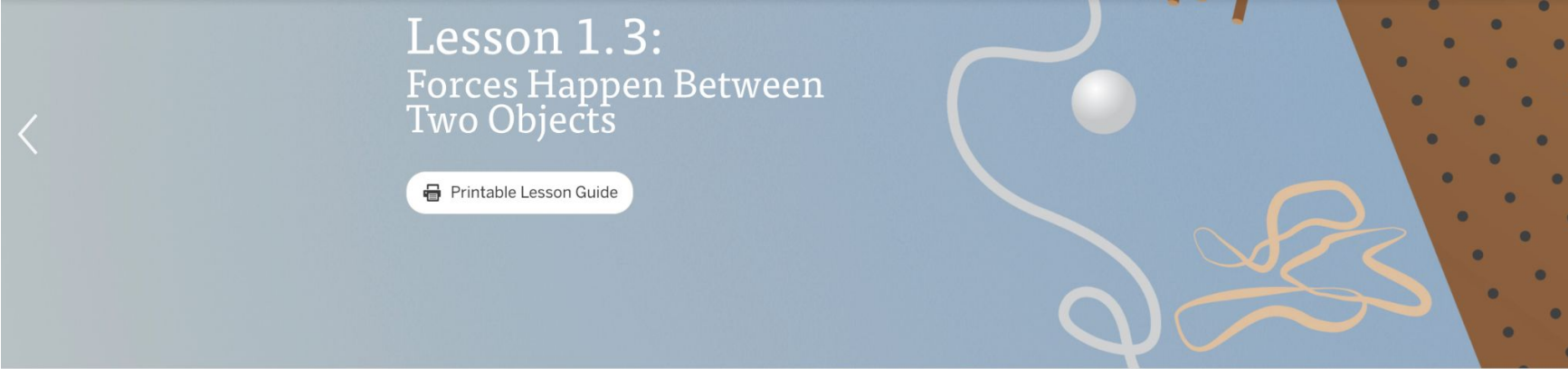
The word **because** means that the first part of what I said made the second part happen.




This book is called *Talking About Forces*. We will read to find out more about **forces**.

We will **visualize** what is happening in the pictures and words.

The Lesson Brief



Lesson 1.3: Forces Happen Between Two Objects


 Printable Lesson Guide

Lesson Brief
(3 Activities)

1
TEACHER-LED DISCUSSION
Connecting Force and
Movement

2
HANDS-ON
Investigating Forces

3
STUDENT-TO-STUDENT
DISCUSSION
Explaining Force Between
Two Objects

 RESET LESSON

Overview

Materials & Preparation

Differentiation




Standards

Vocabulary

Overview

Students deepen their understanding of the Investigation Question: *What makes an object start to move?* by noticing that there are two objects involved in every force. Students begin formalizing their learning from the previous lesson through the introduction of two key vocabulary words, *force* and *exert*, and the co-construction of the

Digital Resources

-  Classroom Slides 1.3 | PowerPoint
-  Classroom Slides 1.3 | Google Slides
-  Completed What We Know About Forces chart

English

Español

Patterns of Earth and Sky

Materials for Lesson 1.3

For the Class

- Explanation Language Frame (from Lesson 1.2)
- Explanation Language Frames Cards: Set 1 (7 cards/set)
- What We Know About Forces Chart: Icon 1
- 1 plastic bag
- 1 shoelace
- 1 flat marble
- 1 large metal nut
- 1 wooden stick
- 1 pipe cleaner*
- 1 tissue or sheet of paper towel*
- 1 plastic cube (or other small math manipulative)*
- 4 sentence strips*
- 1 sheet of chart paper*
- pocket chart (or whiteboard)*
- marker*
- masking tape

For Each Pair of Students

- 1 plastic bag
- 1 shoelace
- 1 flat marble
- 1 large metal nut
- 1 wooden stick
- 1 pipe cleaner*
- 1 sheet of tissue or paper towel*
- 1 plastic cube (or other small math manipulative)*

Modeling Matter

Classroom Wall

Partner Reading Guidelines

1. Sit next to your partner and place the book between you.
2. Take turns reading.
3. Read in a quiet voice.
4. Be respectful and polite to your partner.
5. Ask your partner for help if you need it. Work together to make sure you both understand what you read.

Problem:

Unit Question: How can we create a pinball machine for our class?

Chapter 1 Question: How do we make a pinball start to move?

Investigation Question: What makes an object start to move?

Vocabulary:

Force
exert

Key Concept:

Key Concept:



Grade K | Pushes and Pulls

Lesson 1.3: Forces Happen Between Two Objects

Activity 1

Connecting Force and Movement



Investigation Question:

What makes an object start to move?

Vocabulary



force

a push or a pull

Vocabulary



exert

to cause a force to act on an object

What We Know About Forces

We will use the What We Know About Forces chart to keep track of our ideas about forces.

Let's add our new ideas about **what makes objects start to move.**

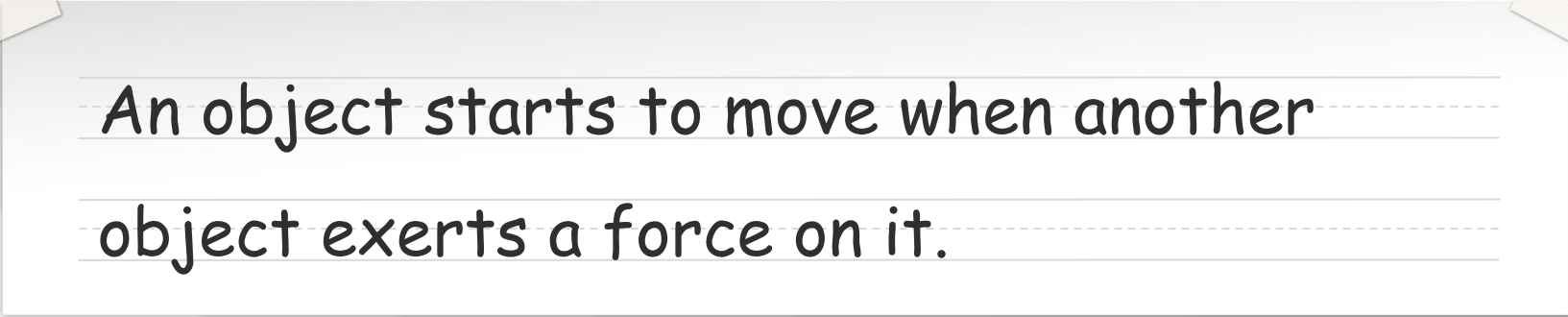
What We Know About Forces

Force
push
pull
throw
kick
hit



We know that when one object makes something move, that object is **exerting a force.**

Key Concept



An object starts to move when another object exerts a force on it.

Activity 2

Investigating Forces



We now know an **object** starts to move when another object **exerts** a **force** on it.

We have already found many ways to exert a force with our bodies and hands.

Now we are going to see if we can create forces in other ways.



We will **investigate** with these objects. We will try to use one object to **create forces**.

I will show you how.



Use the **objects** to create forces.



Activity 3

Explaining Force Between Two Objects





What did you **observe** about how to make objects move?

What kinds of **forces** did you exert?

I noticed you used one object to make another object move.

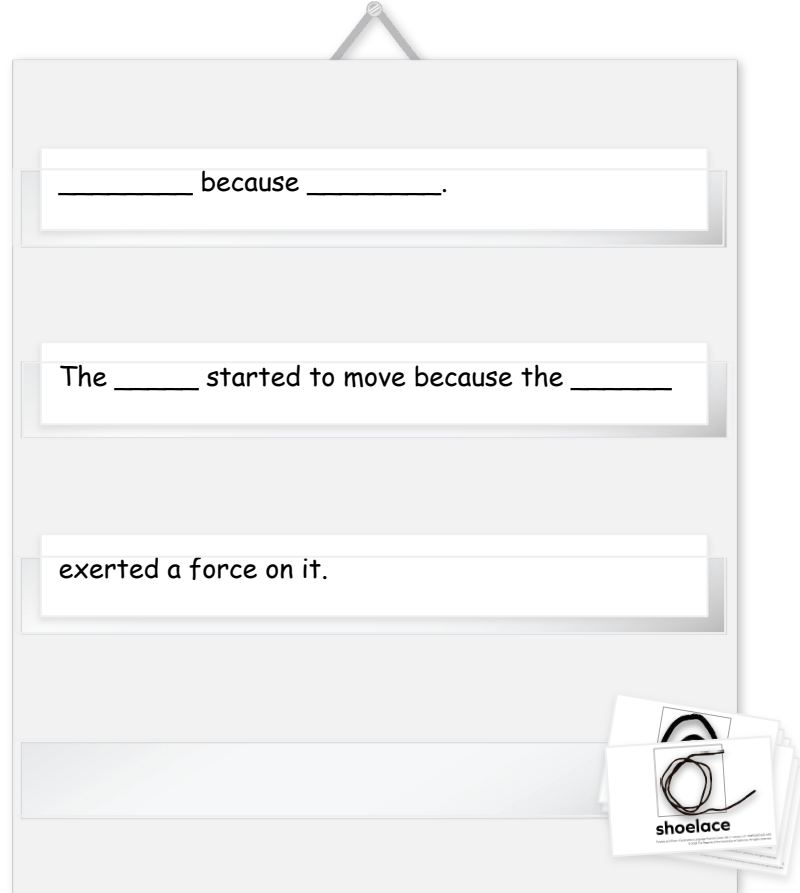


Do you think you can make one of the objects move **by itself**, without anything touching it?

How?

Key Concept

Forces happen between two objects.



_____ because _____.

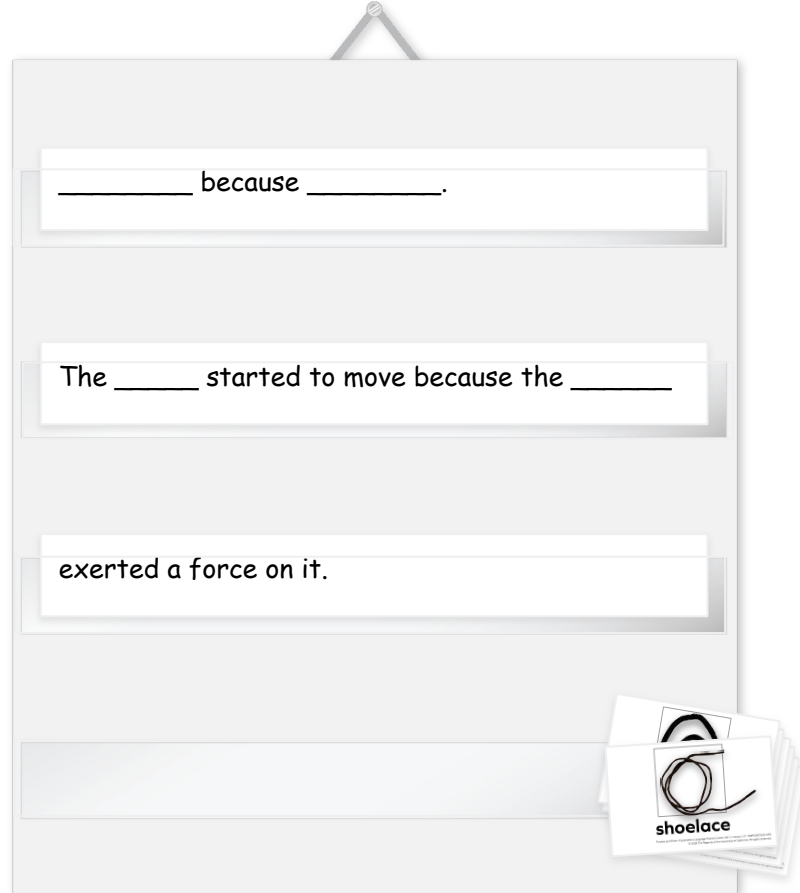
The _____ started to move because the _____

exerted a force on it.

shoelace

Scientists and engineers describe **what happened**, but they also want to explain **why it happened**.

These words will help us explain why something **started to move**.



_____ because _____.

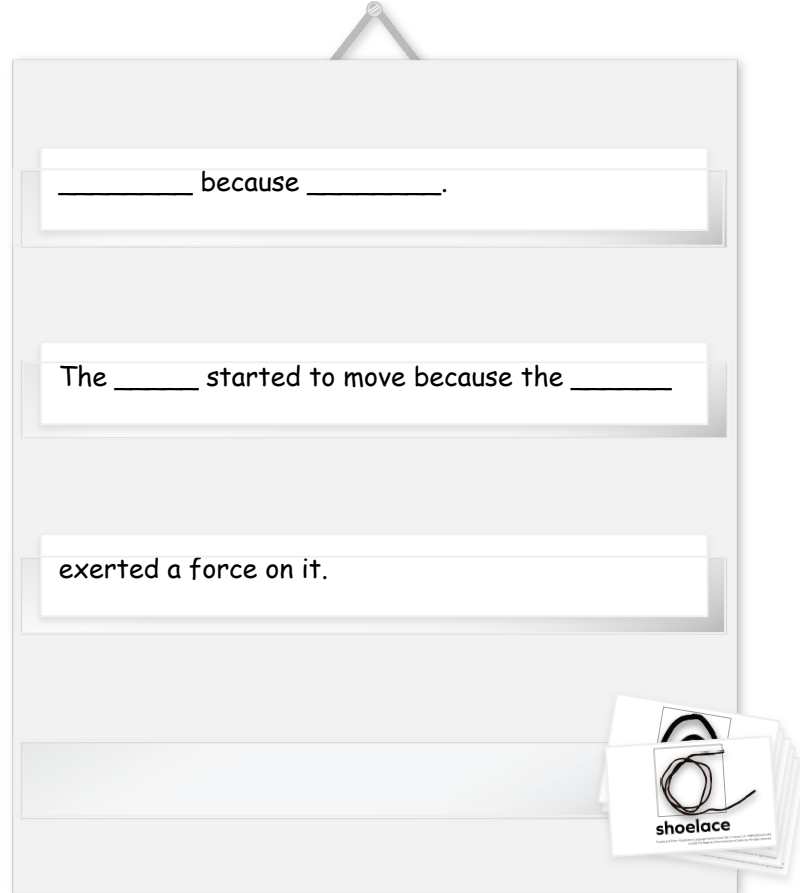
The _____ started to move because the _____

_____ exerted a force on it.

shoelace

Let's work together to make sentences about **pairs of objects** from our investigation.

First, we will **visualize** what happened. Then we can **explain** it.



_____ because _____.

The _____ started to move because the _____

exerted a force on it.

shoelace



Make objects move again.

This time, **practice using these words** to explain what is happening.

End of Lesson

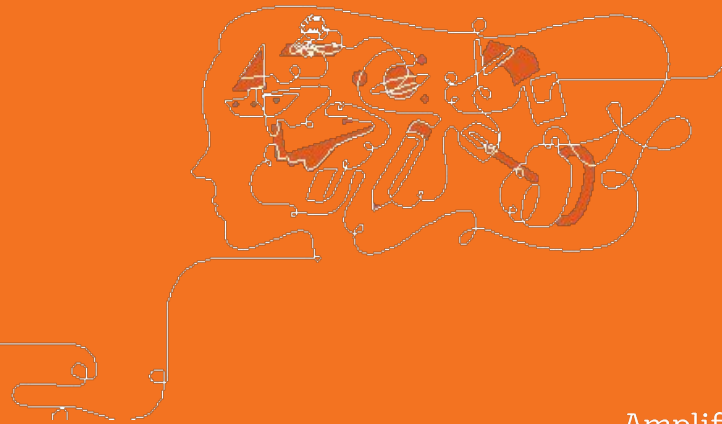


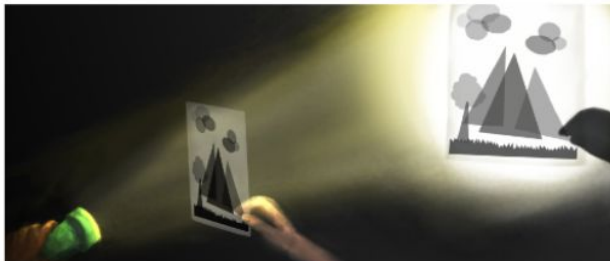
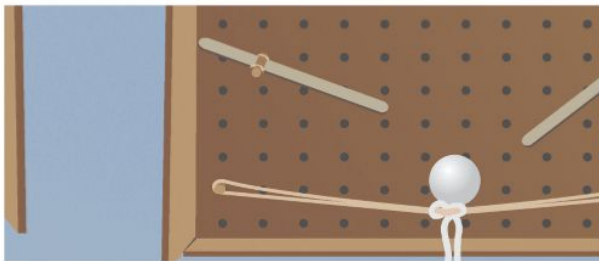
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Break





Plan for the day

- Introduction
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- **Planning**
- Closing

Work time - Planning

- Navigate to a lesson that you'll be teaching in the upcoming week that has a formative assessment opportunity (you might want to refer to the **Embedded Formative Assessment or Assessment System** documents on the Unit Landing Page)
- Review the assessment type and guidance

The screenshot shows a digital lesson interface for "Lesson 1.4: We Are Engineers". At the top right, the title "Lesson 1.4: We Are Engineers" is displayed above a "Printable Lesson Guide" button. Below this is a progress bar with four numbered steps: 1. "How We Are Like Engineers", 2. "Introducing the Box Model", 3. "Designing the Launcher in the Box Model", and 4. "Drawing Diagrams of Our Box Models". The interface is divided into three main sections: "Overview Materials & Preparation Standards Vocabulary" on the left, "Overview" in the center, and "Digital Resources" on the right. The "Overview" section contains text about students engaging with the Box Model, a "Unit Design Problem" about creating a pinball machine, a "Chapter-level Anchor Phenomenon" about pinball movement, a "Design Problem" about pinball launchers, and a "Students learn:" section. The "Digital Resources" section lists various materials like "Classroom Slides 1.4 | PowerPoint", "Classroom Slides 1.4 | Google Slides", "Classroom Videos 1.4 | Zip", "Box Model Preparation: Lesson 1.4", "Completed Box Model", "Completed Pinball Machine Design Goals chart", "Completed What Engineers Do chart", "Chapter 1: Clipboard Assessment Tool", and "Pushes and Pulls Investigation Notebook, pages 4-5".

Work time - Planning

- Download and review the classroom slides
- Read the unit overview
- Read the Materials and Prep
- Read the differentiation
- Prepare any data collectors or assessment materials needed.

The screenshot shows a digital interface for Lesson 1.4: We Are Engineers. At the top, the title "Lesson 1.4: We Are Engineers" is displayed next to a "Printable Lesson Guide" button. Below the title is a progress bar with four steps: 1. Overview, 2. Materials & Preparation, 3. Differentiation, and 4. Standards. The current step is 1. Overview. The main content area is titled "Overview" and contains text about the lesson's purpose and goals. To the right of the main content is a "Digital Resources" section with a list of links to various materials, including Classroom Slides, Classroom Videos, and Completed Pinball Machine Design Goals chart.

Lesson 1.4:
We Are Engineers

Printable Lesson Guide

Lesson Brief
A Overview

1. Overview
2. Materials & Preparation
3. Differentiation
4. Standards

RESET LESSON

Overview

Students begin engaging in the work of engineers as they work with their Box Models. They discuss how engineers engage in certain practices as they design, add to the What Engineers Do chart, and continue working with their Box Models by adding a rubber band launcher to make their pinball move. The lesson closes with students drawing diagrams of this first iteration of their Box Models. The purpose of this lesson is to provide students with an overview of the work engineers do, followed by direct experience using the design cycle. Initial exploration with the Box Model provides the foundation for the design work students will do throughout the unit.

Unit Design Problem: We want to create a pinball machine that lets us control the way a pinball moves.

Chapter-level Anchor Phenomenon: Sometimes a pinball starts to move.

Design Problem: Make the pinball start to move in the Box Model.

Students learn:

Digital Resources

- Classroom Slides 1.4 | PowerPoint
- Classroom Slides 1.4 | Google Slides
- Classroom Videos 1.4 | Zip
- Box Model Preparation: Lesson 1.4
- Completed Box Model
- Completed Pinball Machine Design Goals chart
- Completed What Engineers Do chart
- Chapter 1: Clipboard Assessment Tool
- Pushes and Pulls Investigation Notebook, pages 4-5

Work time - Planning

Be prepared to share out the:

- Lesson chosen
- Type of assessment
- “Look Fors” or “Assess for Understanding”
- “Now What” or “Tailor Instruction”
- Personal observations or reflections

Amplify Science sample assessment data collection tool

Grade : _____
Lesson _____

Look for 1:

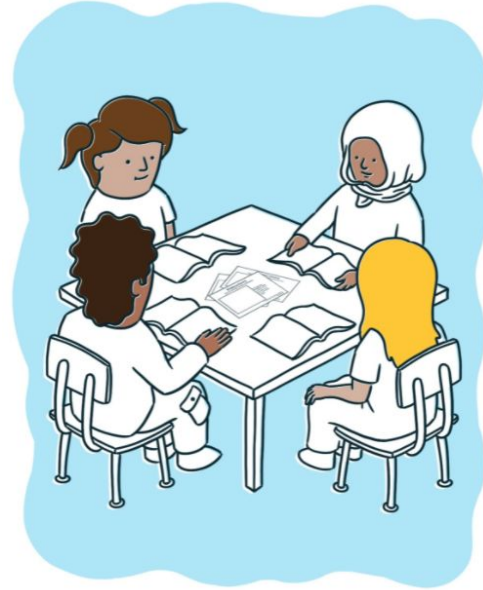
Look for 2:

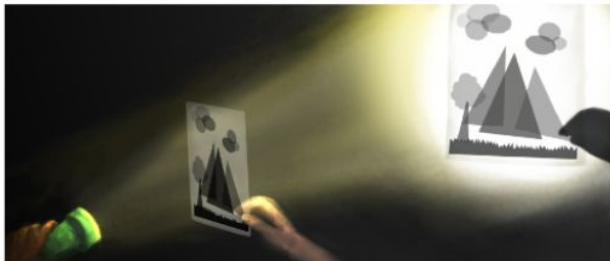
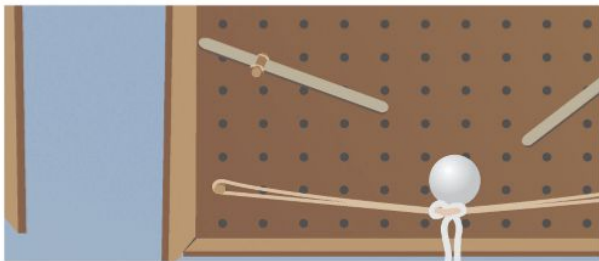
[illegible]

Share Out

Share:

- Lesson chosen
- Type of assessment
- “Look Fors” or “Assess for Understanding”
- “Now What” or “Tailor Instruction”
- Personal observations or reflections



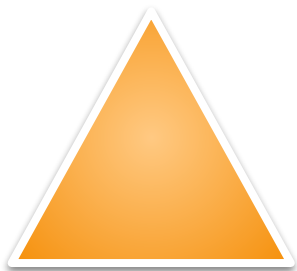


Plan for the day

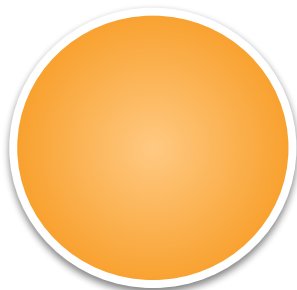
- Introduction
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Closing reflection

Based on our work today, share:



1-3 big points you're taking away from this session



A question or topic that's still circling in your mind



Something that's "squaring" (resonating) with you from this session

Overarching goals

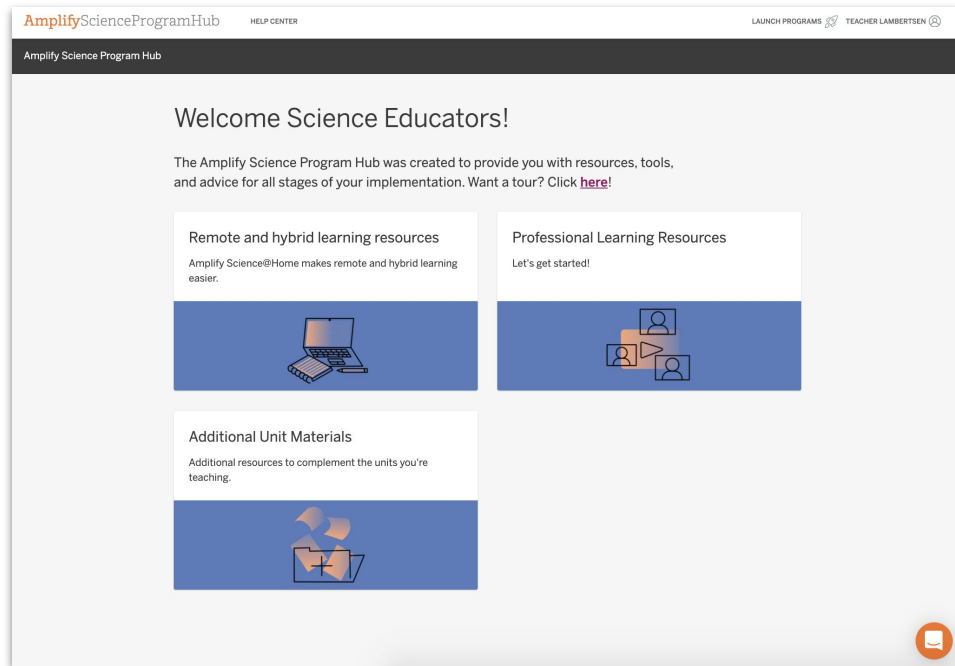
- ☑ Describe the structure and purpose of the Amplify Science Assessment System
- ☑ Plan for the strategic use of assessment resources to analyze and respond to student work

Let's connect
this goal to
our students



Program Hub

- Unit overview videos
- Planning tools
- Remote and hybrid learning resources.

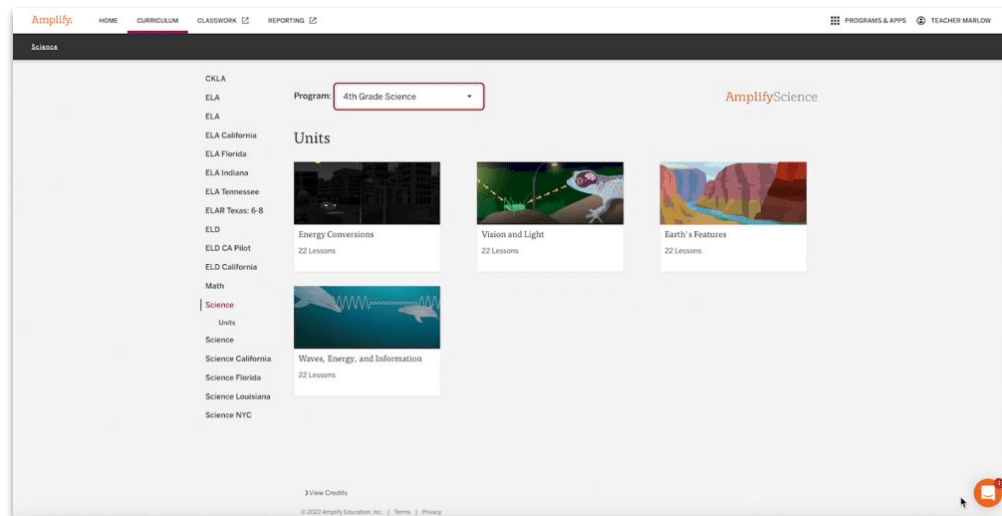


Additional resources and ongoing support

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support.



Amplify Chat



Please provide feedback!

Type:

Strengthen

Session title:

The Assessment System K-5

Professional Learning Specialist name:

Insert name

(insert email, if you would like)