

Amplify Science

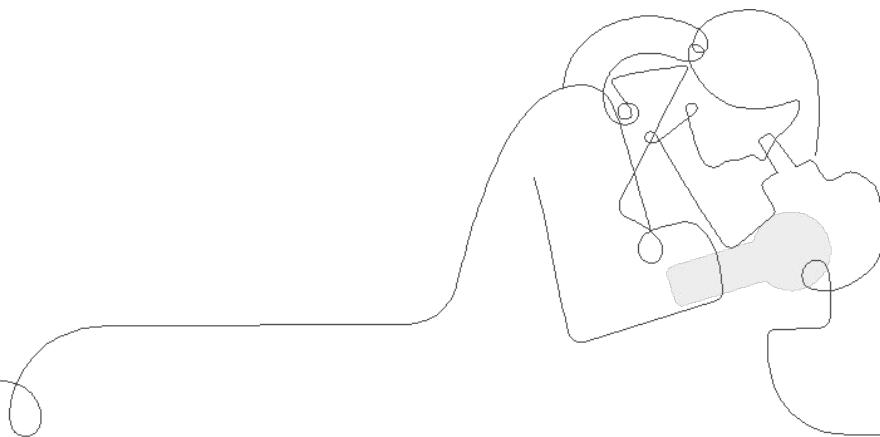
Balancing Forces Unit Deep Dive

Grade 3

LAUSD

Date: September, 2023

Presented by



Opening Reflection

What are your goals for student outcomes as a result of attending this professional workshop?

Participant Notebook

Reflection

Use the provided spaces as a place for reflection throughout the session.

Session goals and student outcomes

| What Connect the workshop goal(s) to an outcome you envision for your students. | Why Reflect on why you want this outcome for your students. | How How will your students achieve the outcome? Reflect on what you learned during the workshop that will impact student outcomes. |
|--|--|--|
| | | |

Name

Amplify Facilitator

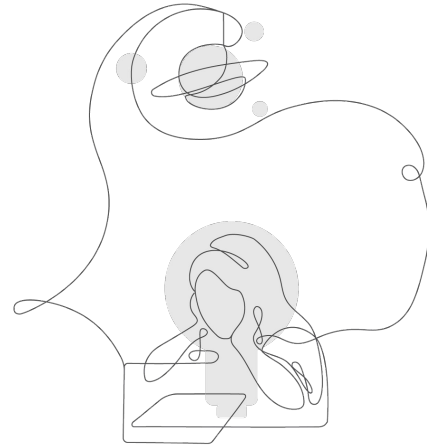
- Add your experience here.
-
-

[Insert Photo]

For an easy way to do it:

- Right click on this image.
- Click “Replace Image.”
- Choose how you’ll upload your image.
- Reposition your photo if necessary.

Please write your name on the index card.



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

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.

Today's Logistics



- Lunch break from 11:30 - 12:30
- The day ends at 3:00
- Please be sure to sign in
- Bathrooms
- Parking lot for questions or concerns
- If you need to stand, feel free to but please stay engaged



Schoolology



[← Back to Schoolology 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: [udidp.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

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: [udidp.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".

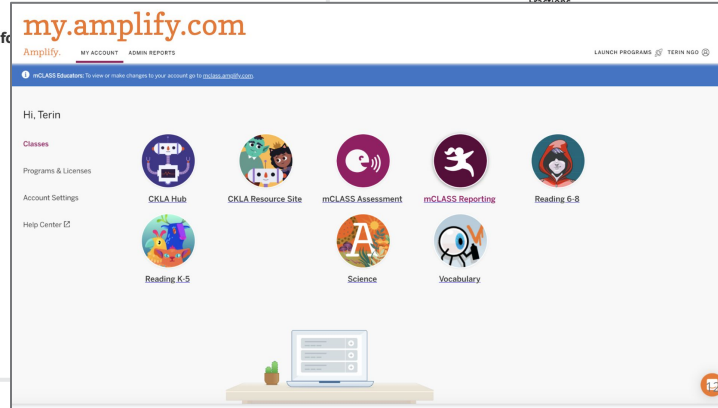
To learn more about using the LMS App Center, please refer to the following video overview.

[← 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

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
 - **californiasci__@pd.tryamplify.net**
 - Password: **AmplifyNumber1**

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

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 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

Hi Teacher

nationalsci20@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

Amplify Science

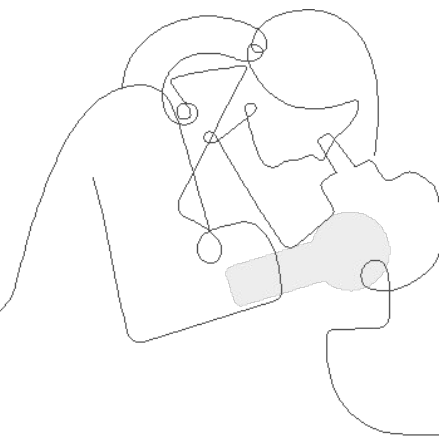
Day 1: Balancing Forces Unit Deep Dive

Grade 3

LAUSD

Date:

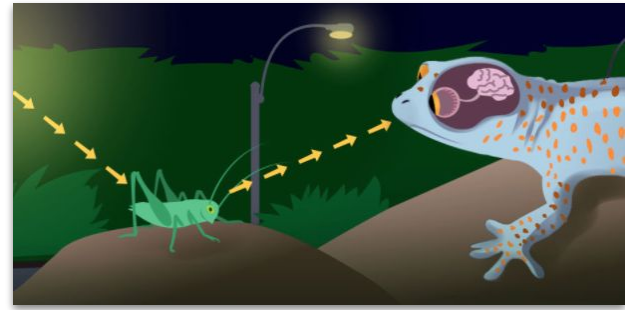
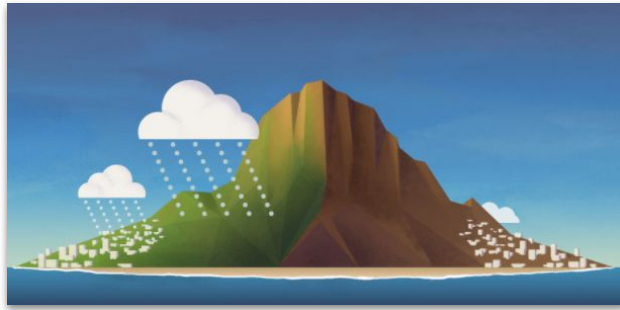
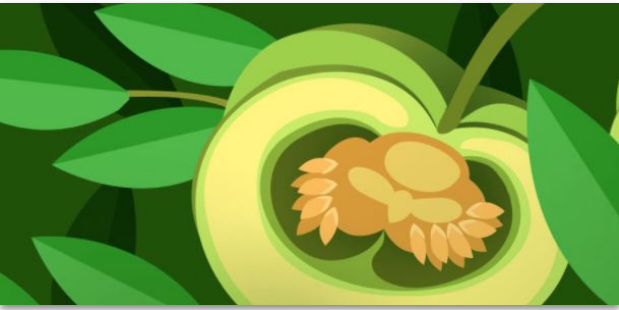
Presented by



LAUSD SUMMER SYMPOSIUM 2023

Session 1 Unit 1 Deep Dive





Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Digging into Chapter 2

Ice Breaker!

Who do we have in the room today?

- Name & School
- Have you taught Amplify Science before and if so, for how long?
- What are your goals for student outcomes after attending this student workshop today?



Navigation Temperature Check

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

1 = Extremely Uncomfortable

2 = Uncomfortable

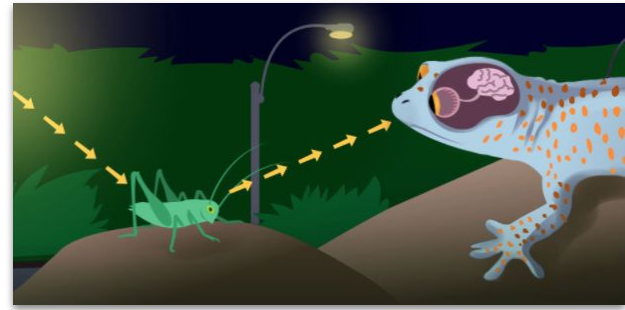
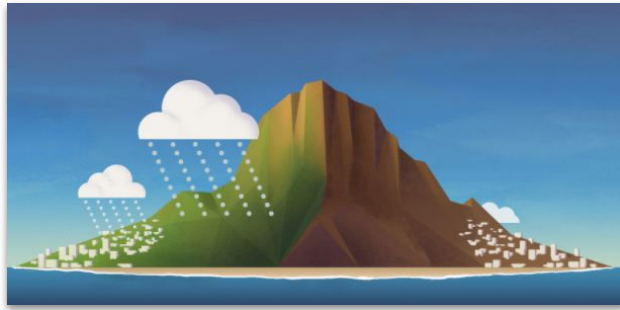
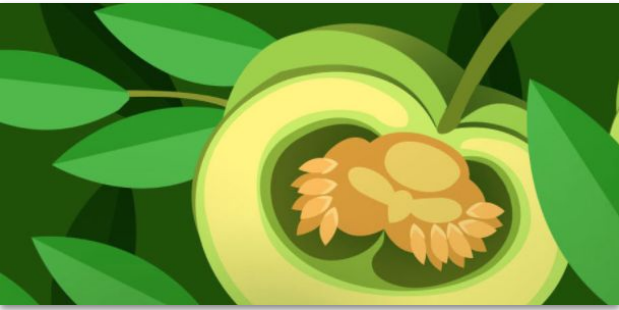
3 = Mild

4 = Comfortable

5 = Extremely Comfortable



Handouts and resources



Plan for the day

- Introduction and framing
- **Unit Internalization**
- Digging into Chapter 1
- Model Lesson
- Multimodal Instruction
- Digging into Chapter 2

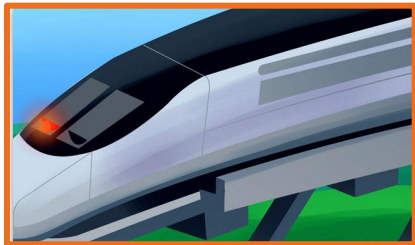
Goals for the day:

By the end of the day, you will:

- ❑ Experience how all the instructional components fit together in the context of the unit
- ❑ Gain a deeper understanding of the purposeful sequencing of each activity and lesson within a chapter
- ❑ Become more familiar with multimodal instruction and how it provides multiple at bats to support student success
- ❑ Use the Amplify curriculum and resources to prepare to teach



Year at a Glance: Grade 3



Balancing Forces

Domain: Physical Science

Unit type: Modeling

Student role:
Engineers

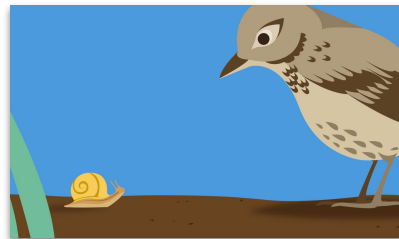


Inheritance and Traits

Domain: Life Science

Unit type: Investigation

Student role: Wildlife biologists

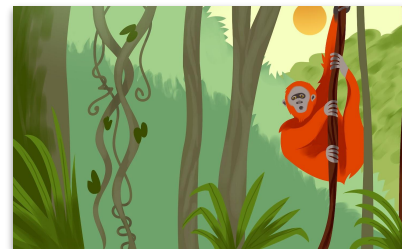


Environments and Survival

Domain: Life Science

Unit type: Engineering Design

Student role:
Biomimicry engineers



Weather and Climate

Domain: Earth and Space Science

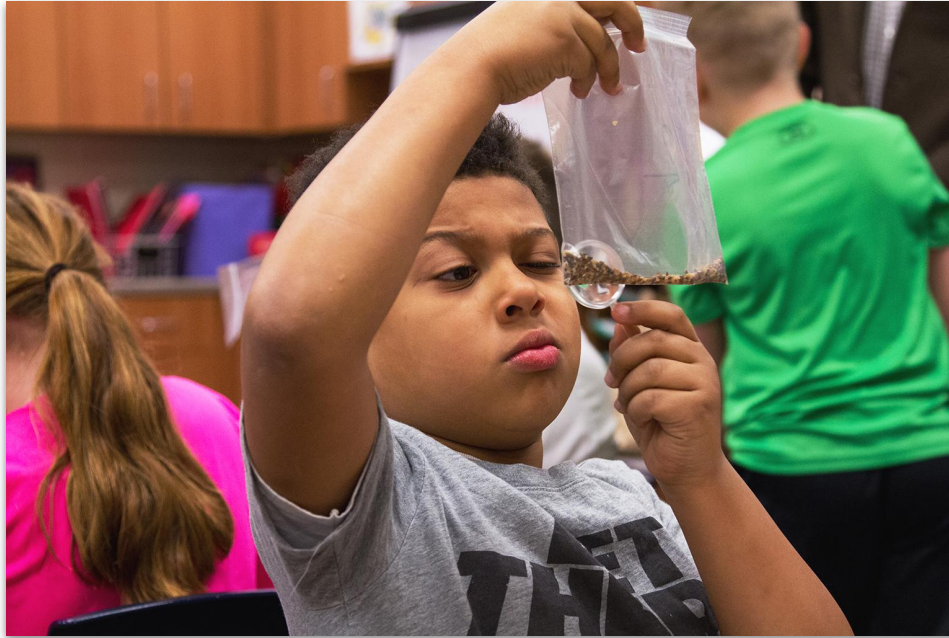
Unit type:
Argumentation

Student role:
Meteorologists

Unit Overview



Phenomenon based learning



Phenomenon-based learning and teaching

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

Comparing topics and phenomena

| Topic-based | Phenomenon-based |
|----------------|--|
| Ocean habitats | A sea turtle can survive in an ocean habitat where sharks live |

Comparing topics and phenomena

A shift in science instruction

from learning about
(like a student)



to figuring out
(like a scientist)

Phenomena-based Instruction

Inquire like a scientist.

Think like a scientist.

Quantify like a scientist.

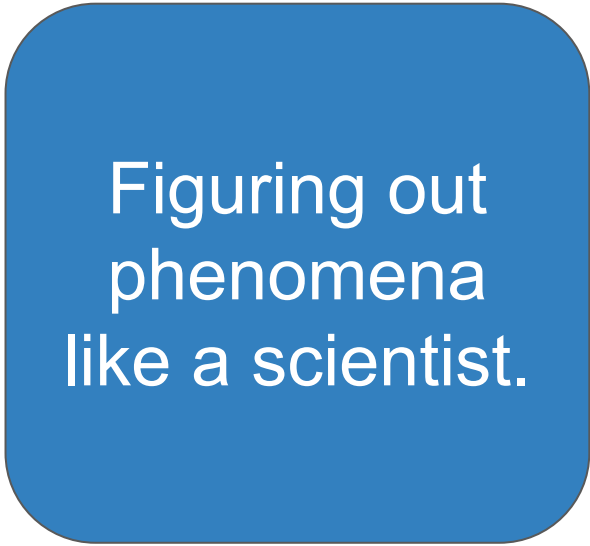
Read like a scientist.

Talk like a scientist.

Write like a scientist.

Critique like a scientist.

Argue like a scientist.



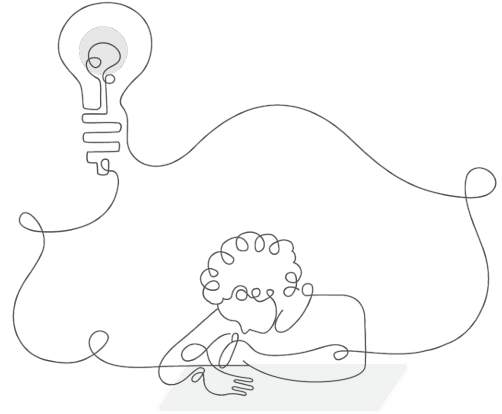
Figuring out
phenomena
like a scientist.

Previewing the unit

Introducing the phenomenon

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

Let's look at the phenomenon, or observable event, students will figure out in your unit.





The train floated up without anything touching it. Later, it fell back down to the track.



We are going to figure out how floating trains work.

Amplify Science

Anchoring phenomenon

- Complex and rich
- Drives learning through a whole unit
- Specific and observable
- Relatable at students' developmental level



Unit Overview



| Unit level internalization | | |
|---|-----------------------------------|----------------------------|
| Anchor phenomenon | | Student role |
| 3-dimensional learning students engage with to explain the anchor phenomenon: | | |
| DCl: What scientists want to know | SEPs: What scientists do | CCCs: How scientists think |
| Learning that occurs in Chapter 1 | Learning that occurs in Chapter 2 | |
| Learning that occurs in Chapter 3 | Learning that occurs in Chapter 4 | |
| Science Background: Key understandings and preconceptions | | |

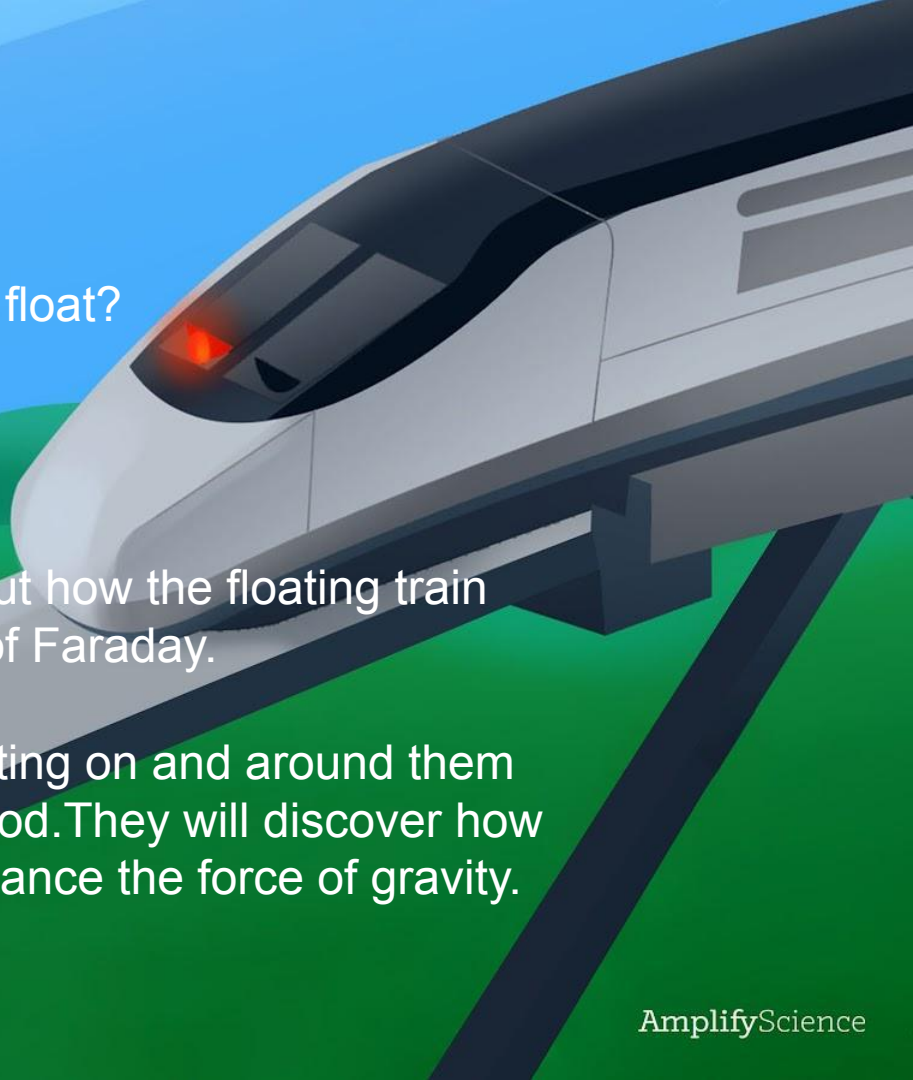
Balancing Forces

Problem: How is it possible for a train to float?

Role: Engineers

What: Students are challenged to figure out how the floating train works in order to explain it to the citizens of Faraday.

How: Students explore forces that are acting on and around them every day, often unseen and misunderstood. They will discover how magnetic force can be used to counterbalance the force of gravity.



Coherent Storylines



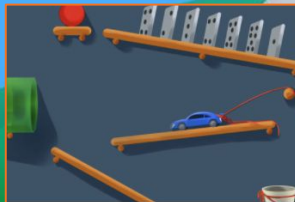
Chapter 1: Why does the train rise?

4 Lessons



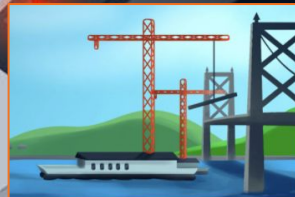
Chapter 2: Why does the train rise without anything touching it?

5 Lessons



Chapter 3: Why does the train fall?

4 Lessons



Chapter 4: Why does the train float, even though gravity is acting on it?

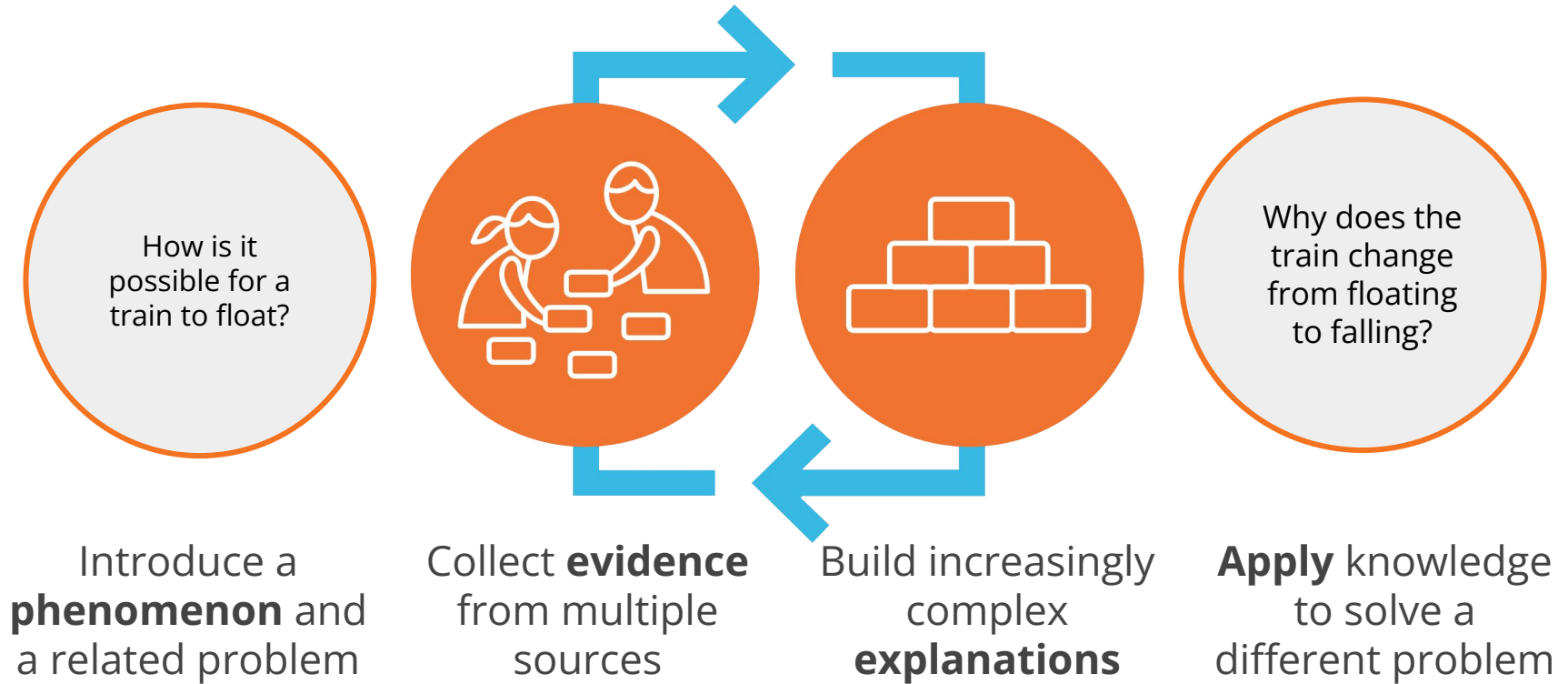
4 Lessons



Chapter 5: Why does the train change from floating to falling?

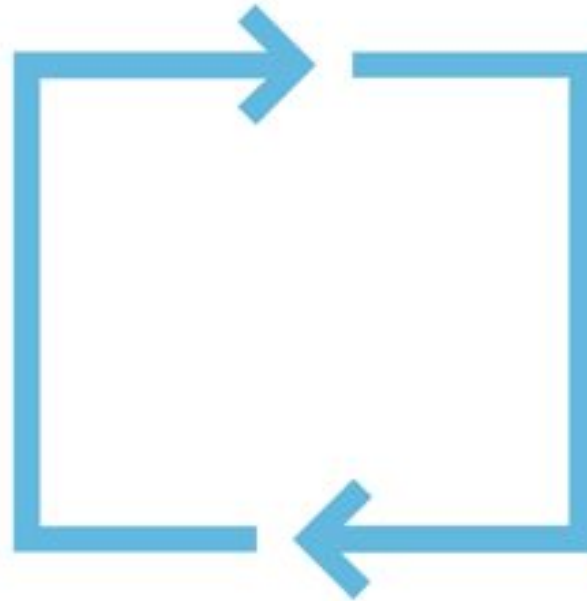
5 Lessons

Amplify Science Approach



Multimodal instruction

For each key concept, students work with evidence in varied modalities.



**Do,
Talk,
Read,
Write,
Visualize**

Unit Anchor Phenomenon

Problem students work to solve

Chapter-level Anchor Phenomenon
Chapter 1 Question

Investigative Phenomenon
Investigation Question

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to problem

Explanation that students can make to answer the Chapter 1 Question

Balancing Forces: Investigating Floating Trains

The floating train rises, floats above the track, then later falls back to the track.
How is it possible for a train to float?

The train rises above the track.
Why does the train rise?

Sometimes objects start to move.
What makes an object start to move? (1.2, 1.3, 1.4)

- Investigate by making blocks move (1.2)
- Read *Forces All Around* (1.3)
- View *Domino* video (1.4)
- Create and analyze chain reactions (1.4)

- A force acts between two objects. (1.3)
- When an object starts moving or stops moving, that is evidence that a force has acted on it. (1.3)

- Discuss why the train starts to move (1.4)
- Write a scientific explanation about the floating train (1.4)

The train rises because a force acts on it. The train started to move and when an object changes how it is moving, that means a force acted on it.

Do



Talk



Read



Write



Visualize



Navigating to the Coherence Flowchart

Amplify. CURRICULUM CLASSWORK REPORTING PROGRAMS & APPS CALIFORNIASCI26 TEACHER

Science California > Balancing Forces

22 Lessons

Balancing Forces

Printable Teacher Guide

- Unit Overview
- Chapters
- Printable Resources**
- Planning for the Unit
- Teacher References
- Offline Preparation

Unit Overview


What's in This Unit

Scientists and engineers use models to test their ideas about how things work. Using similar models to rolling along tracks, students will learn how forces affect motion.


[Read more](#)

Chapters


Chapter 1: Why does the train rise? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Making an Object Move



LESSON 1.3
Forces All Around

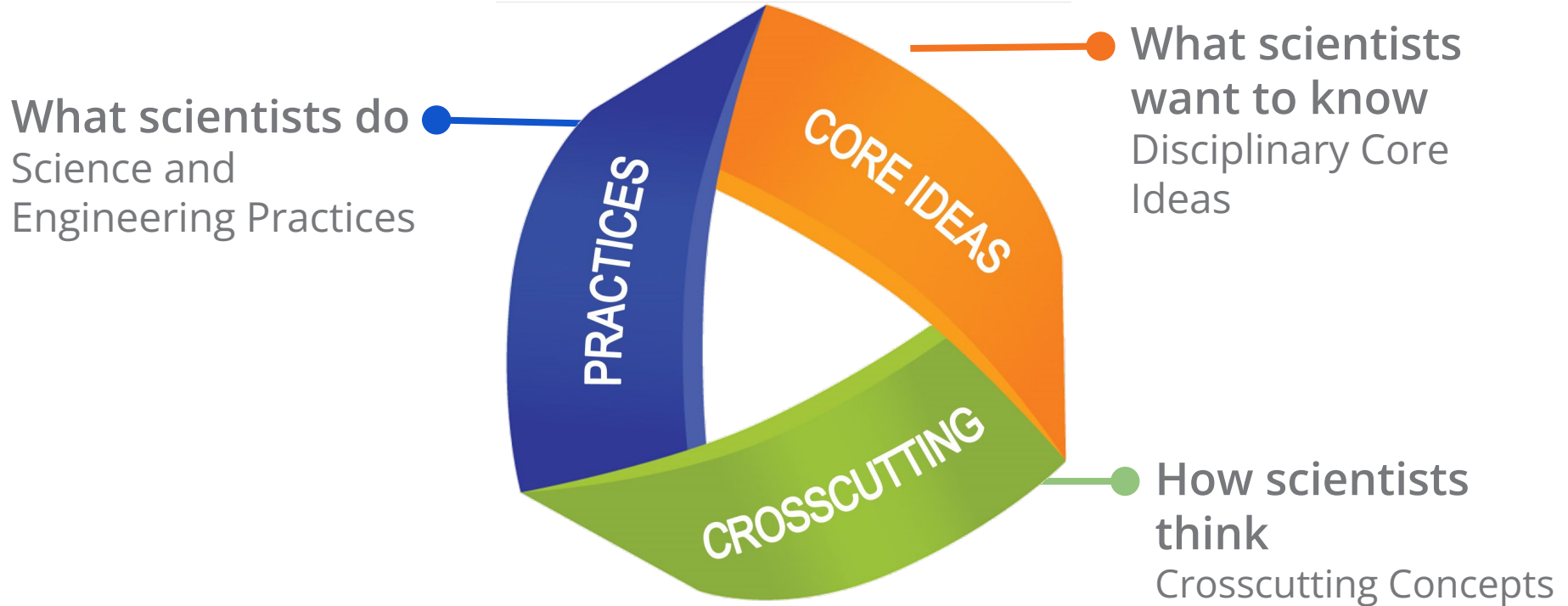
Printable Resources

- 3-D Assessment Objectives
- Copymaster Compilation
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds
- Multi-Language Glossary
- Print Materials (8.5" x 11")
- Possible Responses
- Coherence Flowcharts**
- Crosscutting Concept Tracker
- Investigation Notebook
- NGSS Information for Parents and Guardians
- Print Materials (11" x 17")

English Español

Balancing Forces & NGSS

Using 3-D teaching and learning for figuring out phenomena



Navigating to the Unit Map

The screenshot shows the Amplify website interface. On the left, a sidebar menu lists navigation options: Unit Overview, Chapters, Printable Resources, Planning for the Unit, Teacher References, and Offline Preparation. An orange arrow points from the 'Unit Overview' link in the sidebar to the 'Unit Map' link in the main content area. The main content area displays the 'Balancing Forces' unit overview, including a 'Unit Map' section with a list of chapters and a 'What's in This Unit?' section. A second orange arrow points from the 'Unit Map' link to the 'Unit Map' page. The 'Unit Map' page shows a list of chapters: Chapter 1: Why does the train rise?, Chapter 2: Why does the train rise without anything touching it?, and Chapter 3: Why does the train fall?. Each chapter has a corresponding image and a brief description of the unit's focus.

Unit Map

How is it possible for a train to float?

Students, taking on the role of student scientists, are challenged to figure out how a floating train works in order to explain it to the citizens of Faraday. People in Faraday are excited to hear that a new train service will be built for their city, but are concerned when they hear that it will be a floating train. Students develop models of how the train rises, floats, and then falls back to the track, and then write an explanation of how the train works.

Chapter 1: Why does the train rise?

Students figure out: A train is a big object. Objects can start moving when they are pushed or pulled on by a second object. There must be some force acting between the train and another object to make the train rise.

How they figure it out: Students plan and carry out hands-on investigations and explore text as they seek explanations for why the train rises. They discover patterns in what can make an object change motion by starting to move or stopping. They write their first scientific explanation.

Chapter 2: Why does the train rise without anything touching it?

Students figure out: When the train starts moving as it rises off the track, it does so because of a non-touching force: magnetic force. The train rises because a repelling force acts between magnets on the tracks and magnets on the train.

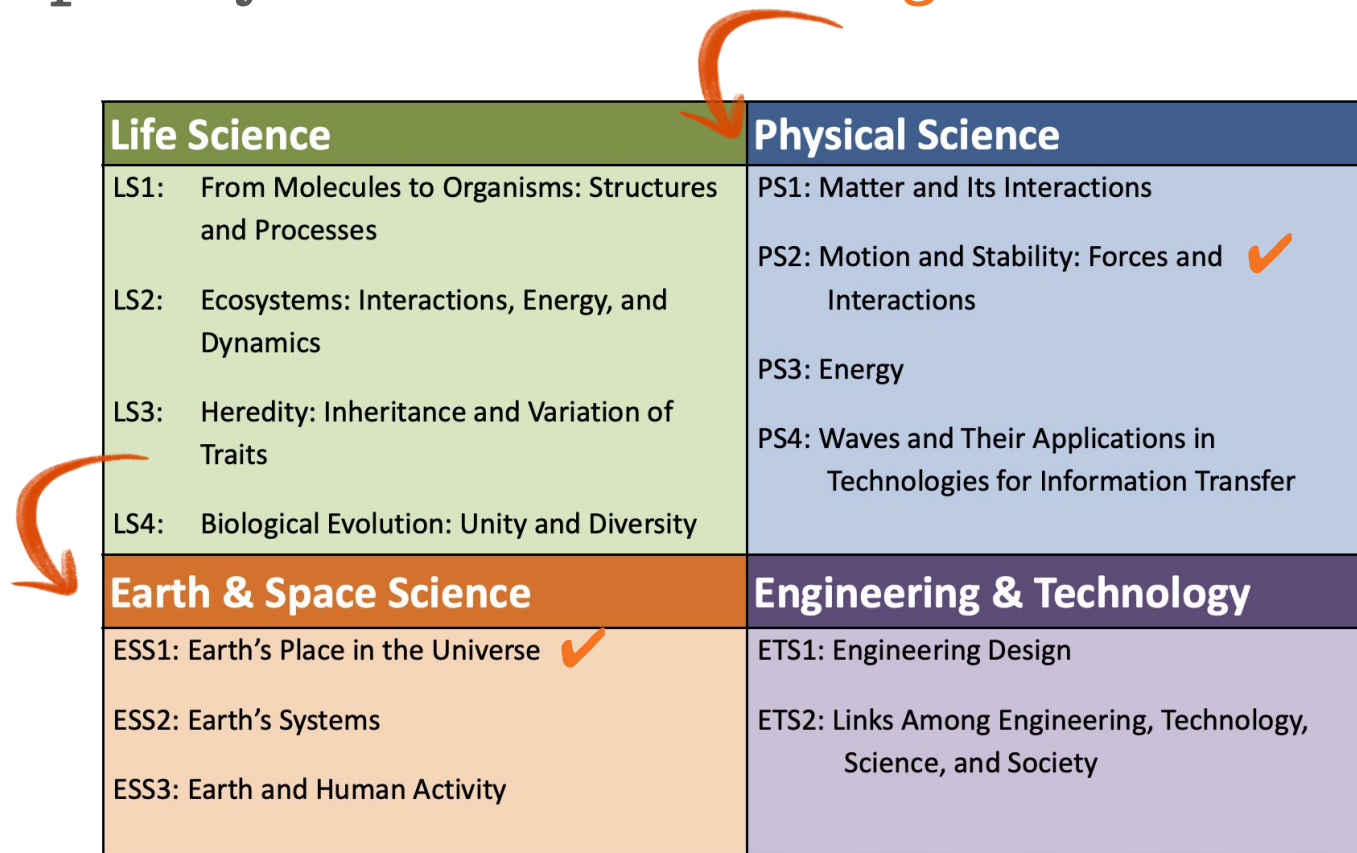
How they figure it out: Students gather evidence to explain how the train could rise without anything touching it. They plan and conduct investigations that help them discover that magnets can exert forces at a distance. To find out how magnetic force can make objects move, they conduct more investigations, analyze data to find patterns, and gather evidence by reading. As they figure out what they think causes the train to rise, students write new explanations and create both physical models and diagram models that represent the magnetic forces at work.

Chapter 3: Why does the train fall?

Students figure out: When the train falls, it does so because a force is acting on it. Since a second object is not pushing or pulling the train, there must be a non-touching force at work. The train falls because of the force of gravity. We know that forces always act between two objects. The force of gravity is acting between the train and Earth. Earth attracts the train, and the train moves toward it.

How they figure it out: Students figure out what they think causes the train to fall. They make observations and pose questions about gravity and gather evidence from a reference book. They design chain reactions involving touching forces and non-touching forces: magnetic force and gravity. They analyze patterns in data from the chain reaction and make diagrams modeling the forces involved. Students apply what they learned about gravity to write scientific explanations for why the train falls.

Disciplinary Core Ideas: **Balancing Forces**



| Life Science | Physical Science |
|---|---|
| LS1: From Molecules to Organisms: Structures and Processes LS2: Ecosystems: Interactions, Energy, and Dynamics LS3: Heredity: Inheritance and Variation of Traits LS4: Biological Evolution: Unity and Diversity | PS1: Matter and Its Interactions PS2: Motion and Stability: Forces and Interactions ✓ PS3: Energy PS4: Waves and Their Applications in Technologies for Information Transfer |
| Earth & Space Science | Engineering & Technology |
| ESS1: Earth's Place in the Universe ✓ ESS2: Earth's Systems ESS3: Earth and Human Activity | ETS1: Engineering Design ETS2: Links Among Engineering, Technology, Science, and Society |

Science and Engineering Practices **Balancing Forces**

inquiry

- 1. Asking questions (for science) and defining problems (for engineering)
- 2. Developing and using models ✓
- 3. Planning and carrying out investigations ✓

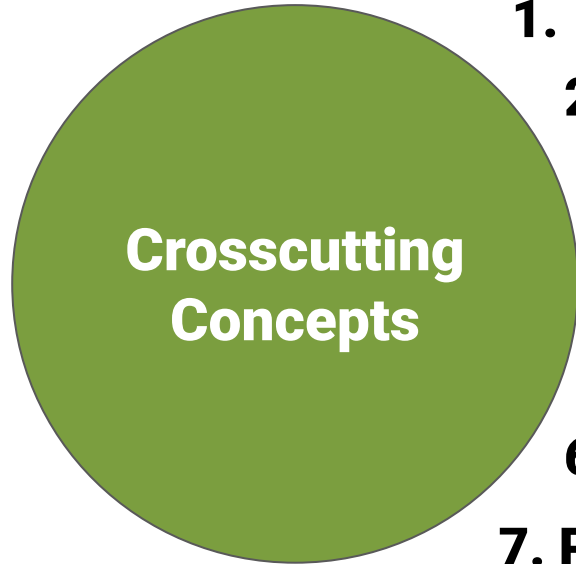
math

- 4. Analyzing and interpreting data ✓
- 5. Using mathematics and computational thinking

language

- 6. Constructing explanations (for science) and designing solutions (for engineering)
- 7. Engaging in argument from evidence
- 8. Obtaining, evaluating, and communicating information ✓

Crosscutting Concepts: **Balancing Forces**



- 1. Cause and Effect**
- 2. Structure and Function**
- 3. System and System Models**
- 4. Scale, Proportion and Quantity**
- 5. Stability and Change ✓**
- 6. Energy and Matter**
- 7. Patterns ✓**

Balancing Forces: 3D Statements

3-D Statements



Key

Practices Disciplinary Core Ideas Crosscutting Concepts

Unit Level

Students are challenged to explain how a floating train works in order to reassure nervous citizens. To solve the mystery, students plan and conduct investigations, analyze patterns in data (patterns), and obtain information about magnetic force, gravity, and balanced and unbalanced forces. Students write explanations and create physical models and diagram models to show why the train's vertical motion is stable at times and changes at times (stability and change).

Navigating to the 3-D Statements

Amplify CURRICULUM CLASSWORK REPORTING

Science California > **Balancing Forces**

Unit Overview
Chapters
Printable Resources
Planning for the Unit
Teacher References
Offline Preparation

English Español

Balancing Forces

Printable Teacher Guide

Unit Overview

What's in This Unit?

Scientists and engineers have figured out how to make trains go faster. Using similar principles, engineers are trying to make cars fly. In the Balancing Forces unit, students will come to understand why the train's vertical motion is stable at times and changes at times (stability and change).

[Read more >](#)

Chapters

Chapter 1: Why does the train rise?

LESSON 1.1 Pre-Unit Assessment

LESSON 1.4 Explaining Forces and the Train

3-D Statements

Key

Practices Disciplinary Core Ideas Crosscutting Concepts

Unit Level

Students are challenged to explain how a floating train works in order to reassure nervous citizens. To solve the mystery, students plan and conduct investigations, analyze patterns in data (patterns), and obtain information about magnetic force, gravity, and balanced and unbalanced forces. Students write explanations and create physical models and diagram models to show why the train's vertical motion is stable at times and changes at times (stability and change).

Chapter Level

Chapter 1: Why does the train rise?

Students ask questions about the floating train and discover, by obtaining information from reading, how a force can cause an object's motion to change as it starts or stops moving (cause and effect; stability and change). They then communicate this information in an explanation about the floating train.

Chapter Targeted 3-D Learning Objectives

These objectives are formally assessed across the chapter [see assessment guidance locations noted]

DCI: PS2.A: Forces and Motion

- PS2.A-E1: Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. [OTFA 2: CJ 1]

DCI: PS2.B: Types of Interactions

- PS2.B-E1: Objects in contact exert forces on each other. [CJ 1]

SEP: Obtaining, Evaluating, and Communicating Information

- INFO-E1: Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence. [OTFA 1]
- INFO-E5: Communicate scientific and/or technical information orally and/or in written formats, including various forms of media and may include tables, diagrams, and charts. [CJ 1]

Explore or review the key planning documents

Spend a few more minutes exploring or reviewing the documents on the Unit Landing Page.

The screenshot shows the Amplify website interface for the 'Balancing Forces' unit. At the top, there's a navigation bar with 'Amplify' logo, 'CURRICULUM', 'CLASSWORK', and 'REPORTING'. Below this, a dark banner features an illustration of a high-speed train and a person's legs standing on a platform, with the text 'Balancing Forces' and a 'Printable Teacher Guide' button. The main content area is divided into two columns. The left column contains a sidebar menu with links: 'Unit Overview', 'Chapters', 'Printable Resources', 'Planning for the Unit', 'Teacher References', and 'Offline Preparation'. The right column has a 'Unit Overview' section with a 'What's in This Unit?' heading and a paragraph explaining the unit's focus on hoverboards and forces. Below this is a 'Read more' link. Further down is a 'Chapters' section for 'Chapter 1: Why does the train rise?'. At the bottom, there are three lesson cards: 'LESSON 1.1 Pre-Unit Assessment', 'LESSON 1.2 Making an Object Move', and 'LESSON 1.3 Forces All Around'. The bottom of the page includes a language toggle for 'English' and 'Español', and a small orange icon in the bottom right corner.

Amplify CURRICULUM CLASSWORK REPORTING

Science California > Balancing Forces

Balancing Forces

Printable Teacher Guide

Unit Overview

Chapters

Printable Resources

Planning for the Unit

Teacher References

Offline Preparation

Unit Overview

What's in This Unit?

Scientists and engineers have figured out a way to build a train that actually floats on air as it goes cruising down the track at high speeds. Using similar principles, engineers have created a hoverboard—a device like a skateboard that floats above a track rather than rolling along the ground. In the *Balancing Forces* unit, students work to investigate and then explain how these inventions seem to defy logic. Over the course of the unit, through firsthand experiences, discourse, and reading and writing informational text, students will come to understand how forces can cause stability or change in an object's motion. They will discover how

Read more

Chapters

Chapter 1: Why does the train rise?

LESSON 1.1 Pre-Unit Assessment

LESSON 1.2 Making an Object Move

LESSON 1.3 Forces All Around

English Español

Explaining the phenomenon: Science Concepts

Unit Question: What can make an object move or not move?



Navigating to the Lesson Overview Compilation

The screenshot displays the Amplify Science California website interface. The top navigation bar includes links for CURRICULUM, CLASSWORK, and REPORTING. The main header shows the unit title "Balancing Forces" with a "Printable Teacher Guide" button. A sidebar on the left lists navigation options: Unit Overview, Chapters, Printable Resources, Planning for the Unit, Teacher References, and Offline Preparation. An orange arrow points from the "Teacher References" link to a detailed view of the "Lesson Overview Compilation".

Unit Overview

What's in This Unit?

Scientists and engineers have figured out a way to build a speeds. Using similar principles, engineers have created a than rolling along the ground. In the *Balancing Forces* unit, seem to defy logic. Over the course of the unit, through first text, students will come to understand how forces can cau

[Read more >](#)

Chapters

Chapter 1: Why does the train rise? ⓘ

LESSON 1.1
Pre-Unit Assessment

LESSON 1.2
Making an Object Move

LESSON 1.4
Explaining Forces and the Train

Lesson Overview Compilation

Lessons in This Unit

Chapter 1 Lessons

- Lesson 1.1: Pre-Unit Assessment
- Lesson 1.2: Making an Object Move
- Lesson 1.3: Forces All Around
- Lesson 1.4: Explaining Forces and the Train

Chapter 2 Lessons

- Lesson 2.1: Discovering Non-Touching Forces
- Lesson 2.2: What Objects Do Magnetic Forces Act On?
- Lesson 2.3: Investigating Ways Magnetic Force Moves Objects
- Lesson 2.4: What My Sister Taught Me About Magnets
- Lesson 2.5: Explaining Magnetic Force and the Train

Chapter 3 Lessons

- Lesson 3.1: Observing Evidence of Gravity
- Lesson 3.2: Reading About Gravity
- Lesson 3.3: Observing Forces in Chain Reactions
- Lesson 3.4: Modeling and Explaining the Falling Train

Chapter 4 Lessons

- Lesson 4.1: One Object, Two Forces
- Lesson 4.2: Investigating Balanced Forces
- Lesson 4.3: Explaining a Bridge
- Lesson 4.4: Modeling and Explaining Balanced Forces

Chapter 5 Lessons

- Lesson 5.1: Investigating Unbalanced Forces
- Lesson 5.2: Hoverboard
- Lesson 5.3: Electromagnets and Predicting Patterns
- Lesson 5.4: Modeling the Train
- Lesson 5.5: End-of-Unit Assessment: Students' Explanations

Chapters at a Glance

Unit Question

What can make an object move or not move?

Chapter 1: Why does the train rise?

Chapter Question

Why does the train rise?

Investigation Questions

- What makes an object start to move? (1.2, 1.3, 1.4)

Key Concepts

- A force acts between two objects. (1.3)

Explaining the phenomenon: Science Concepts

Unit Question: What can make an object move or not move?

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



Navigating to the Progress Build

The screenshot shows the Amplify website interface. On the left, a sidebar menu lists various resources: Unit Overview, Chapters, Printable Resources, Planning for the Unit, Teacher References, and Offline Preparation. An orange arrow points from the 'Unit Overview' link in the sidebar to the 'Unit Overview' section of the main content area. The main content area is titled 'Balancing Forces' and includes a 'Printable Teacher Guide' button. Below the title, there is a 'Unit Overview' section with a description of the unit and a 'Read more' link. To the right of the 'Unit Overview' section is a 'Progress Build' section, which is highlighted with a white background and a print icon. The 'Progress Build' section contains three levels of progress build descriptions, each with a bolded key concept.

Unit Overview

What's in This Unit?

Scientists and engineers have figured out a way to make trains move faster than rolling along the ground. In the *Balancing Forces* unit, students will come to understand how forces act on objects.

[Read more >](#)

Chapters

Chapter 1: Why does the train rise?

LESSON 1.1 Pre-Unit Assessment

LESSON 1.2 Making an Object Move

LESSON 1.4 Explaining Forces and the Train

Progress Build

A Progress Build describes the way in which students' explanations of the central phenomenon should develop and deepen over the course of a unit. It is an important tool in understanding the design of the unit and in supporting students' learning. A Progress Build organizes the sequence of instruction, defines the focus of the assessments, and grounds inferences about students' understanding of the content, specifically at each of the Critical Juncture Assessments found throughout the unit. A Critical Juncture is the differentiated instruction designed to address specific gaps in students' understanding. This document will serve as an overview of the *Balancing Forces: Investigating the Floating Train* Progress Build. Since the Progress Build is an increasingly complex yet integrated explanation, we represent it below by including the new ideas for each level in bold.

In the *Balancing Forces* unit, students will learn to construct scientific explanations of a central phenomenon: how the floating train in the town of Faraday works.

Assumed prior knowledge (preconceptions): When you push or pull something, it starts moving.

Progress Build Level 1: A force is a push or pull that acts between two objects.

A force is a push or pull exerted on an object. When something starts or stops moving, that is evidence of a force. Forces always act between two objects.

Progress Build Level 2: Forces can be touching or non-touching.

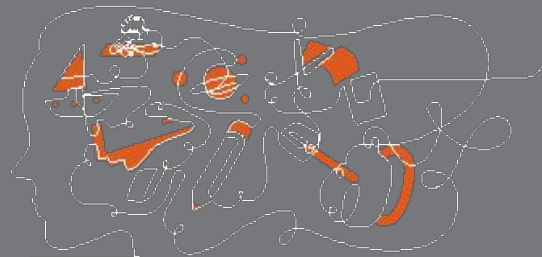
A force is a push or pull exerted on an object. When something starts or stops moving, that is evidence of a force. Forces always act between two objects. **Forces can be touching or non-touching. Gravity is a non-touching force that acts between Earth and all other objects. Magnetic force is a non-touching force that acts between magnets and some other metal objects.**

Progress Build Level 3: More than one force can act on an object at the same time. When those forces are balanced, a still object will remain still; when those forces are unbalanced, the object will start to move.

A force is a push or pull exerted on an object. When something starts or stops moving, that is evidence of a force. Forces always act between two objects. Forces can be touching or non-touching. Gravity is a non-touching force that acts between Earth and all other objects. Magnetic force is a non-touching force that acts between magnets and some other metal objects. **More than one force can act on an object at a time. If the forces are in opposite directions and of the same strength, the forces are balanced, and a nonmoving object will not start to move. If the forces are in opposite directions and are not of the same strength, the forces are unbalanced, and the object will move in the direction of the stronger force.**

Progress Build

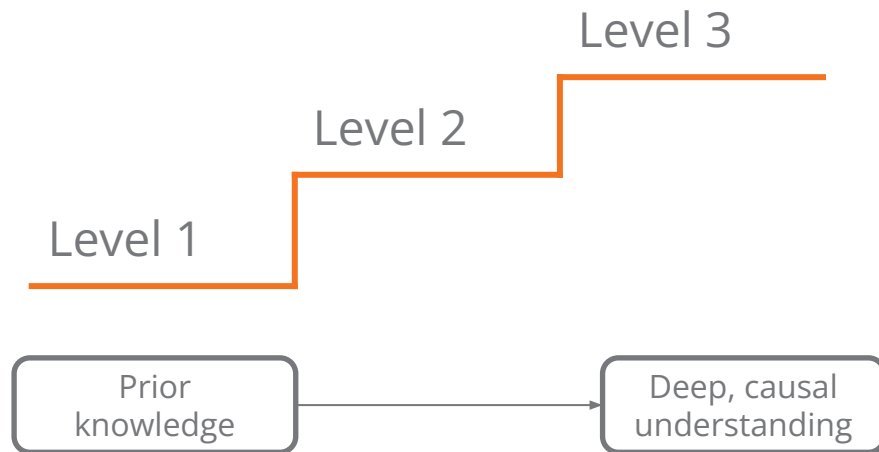
A Progress Build describes the way in which students' explanations of the central phenomenon should develop and deepen over the course of a unit. It is an important tool in understanding the design of the unit and in supporting students' learning. **A Progress Build organizes the sequence of instruction and defines the focus of the assessments.**



Unpacking the Progress Build

Understanding a unit's Progress Build will help you guide your students, address misconceptions, and avoid giving ideas away too early in the unit.

In this activity, you'll use the Progress Build.



Progress Build

Balancing Forces

Assumed prior knowledge (preconceptions): When you push or pull something, it starts moving.

Level 3

More than one force can act on an object at the same time. When those forces are balanced, a still object will remain still; when those forces are unbalanced, the object will start to move.

What new ideas are added at Level 3?

Level 2

Forces can be touching or non-touching.

What new ideas are added at Level 2?

Level 1

A force is a push or pull that acts between two objects.

Unpacking the Progress Build

Group Work time

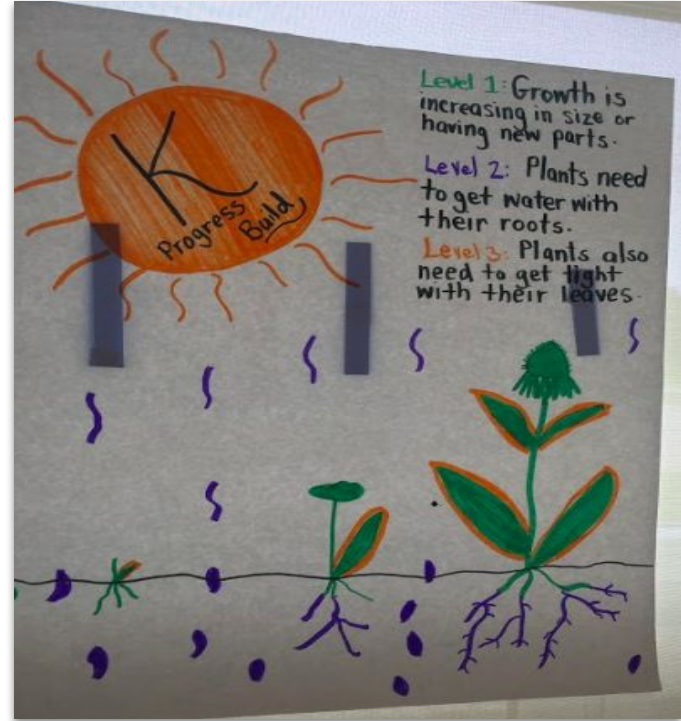
The purpose of this next work time is to understand what the levels of the Progress Build are in this unit, and reinforce understanding of its science concepts.



Progress Build analysis

Group work time

- With your group or partner, create a visual representation of all the levels of your unit's progress build.



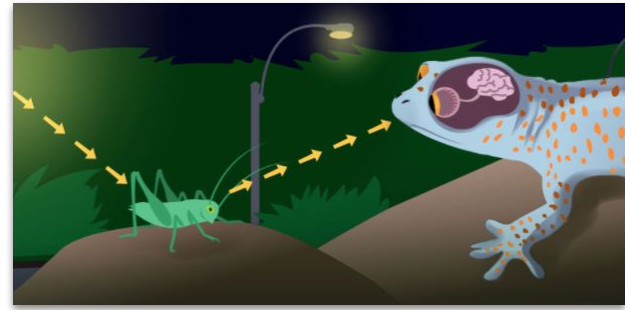
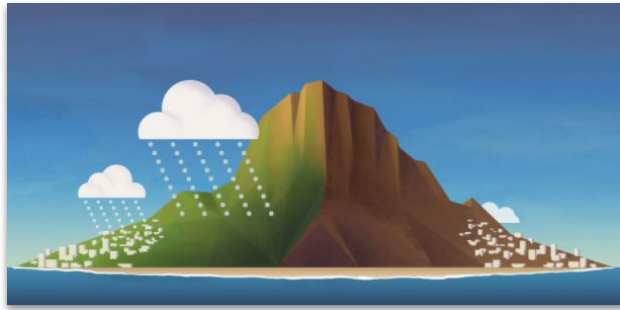
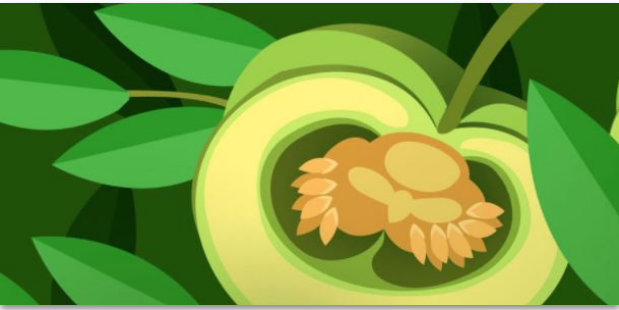
Progress Build analysis

Presentations



Questions?





Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Multimodal Instruction
- Digging into Chapter 2

Balancing Forces: Chapter 1

Chapters

Chapter 1: Why does the train rise? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Making an Object Move



LESSON 1.3
Forces All Around



LESSON 1.4
Explaining Forces and the
Train

Digging in to chapter 1

Group Work time

1. Form groups of 2, 3 or 4
2. Each group will pick a lesson in Chapter 1 (1.1 - 1.4)
3. Chart the activities in the lesson. Be sure to include:
 - a. Purpose of lesson
 - b. Modalities of each activity (do, talk, read, write or visualize)
 - c. Vocabulary introduced
 - d. Key Concepts introduced
4. Be prepared for group to **demonstrate** at least one activity in the lesson.



Purpose of the lesson

Lesson 1.2: Making an Object Move

Printable Lesson Guide

2 HANDS-ON
Making Blocks Move

3 TEACHER-LED DISCUSSION
Sharing Observations

RESET LESSON

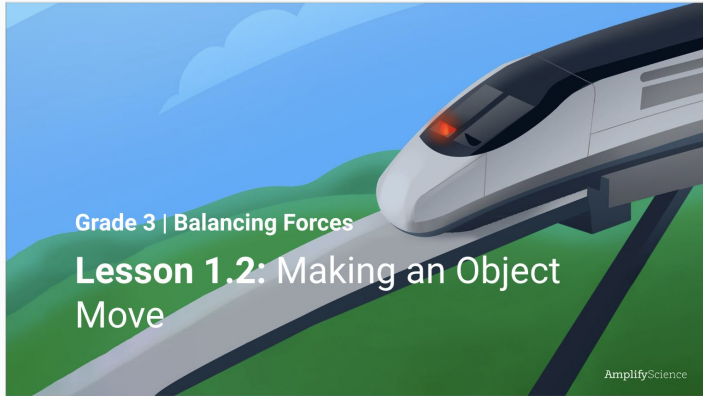
Overview
Materials & Preparation
Differentiation
Standards
Vocabulary
Unplugged?

Overview

Students are introduced to their role as scientists and to the problem they will tackle in this unit—explaining how floating trains work. After seeing a short animated video of a floating train, students wonder what could make the train rise and what could make it fall back to the track. Students are then introduced to the more general Unit Question they will answer over the course of the unit: *What can make an object move or not move?* Students begin by investigating what makes an object start to move. Finding ways to move blocks, students learn that they cannot see the forces they make—forces are not something that can be seen—but students can see the effects of forces on other objects as they make them move. Students begin to see these effects as evidence of forces. The purpose of this lesson is to engage students in firsthand experiences with forces and to provide them with practice in evidence-based thinking.

Unit Anchor Phenomenon: The floating train rises, floats above the track, then later falls back to the track.
Chapter-level Anchor Phenomenon: The train rises above the track.
Investigative Phenomenon: Objects (e.g., blocks, dominos, balloons, rubber bands) start to move in different ways (e.g., a block starts to move when it is pulled by a rubber band).

Lesson Brief



Grade 3 | Balancing Forces
Lesson 1.2: Making an Object Move
AmplifyScience

Digital Resources

- Classroom Slides 1.2 | PowerPoint
- Classroom Slides 1.2 | Google Slides
- All Projections
- Classroom Videos 1.2 | Zip
- Class Observation Table: Completed
- Video: Floating Train
- Balancing Forces Investigation Notebook, page 2
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

Lesson purpose: To engage students in firsthand experiences with forces and to provide them with practice in evidence-based thinking

Please refer to this lesson's Materials & Preparation section in the digital Teacher's Guide or the Print Teacher's Guide for information about preparing to teach this lesson, including any applicable safety notes. Below are links to resources used in this lesson.

[Balancing Forces Investigation Notebook, page 2](#)
[Completed Class Observation Table](#)

Classroom Slides

Modalities

Lesson at a Glance

(Teacher Only) Introducing the Problem (10 min.)

Learning about the existence of floating trains and being challenged to wonder how floating trains work invites students into their role as scientists.

1: Discussing Initial Ideas (10 min.)

Students access their prior knowledge and pose questions as they wonder how the floating train works.

2: Making Blocks Move (20 min.)

Students gain firsthand experience creating pushes and pulls and observing what makes an object start to move.

3: Sharing Observations (20 min.)

The teacher compiles students' observations on the Class Observation Table, which the class will return to in the next lesson.

The Lesson Brief

Unit Anchor Phenomenon

Problem students work to solve

Chapter-level Anchor Phenomenon
Chapter 1 Question

Investigative Phenomenon
Investigation Question

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to problem

Explanation that students can make to answer the Chapter 1 Question

Balancing Forces: Investigating Floating Trains

The floating train rises, floats above the track, then later falls back to the track.
How is it possible for a train to float?

The train rises above the track.
Why does the train rise?

Sometimes objects start to move.
What makes an object start to move? (1.2, 1.3, 1.4)

- Investigate by making blocks move (1.2)
- Read *Forces All Around* (1.3)
- View *Domino* video (1.4)
- Create and analyze chain reactions (1.4)

- A force acts between two objects. (1.3)
- When an object starts moving or stops moving, that is evidence that a force has acted on it. (1.3)

- Discuss why the train starts to move (1.4)
- Write a scientific explanation about the floating train (1.4)

The train rises because a force acts on it. The train started to move and when an object changes how it is moving, that means a force acted on it.

Coherence Flowchart

Vocabulary

Lesson 1.2: Making an Object Move

Printable Lesson Guide

2 HANDS-ON
Making Blocks Move

3 TEACHER-LED DISCUSSION
Sharing Observations

RESET LESSON

Questions

Materials & Preparation

Standards

Vocabulary

Unplugged?

Overview

Students are introduced to their role as scientists they will tackle in this unit—explaining how floating train, seeing a short animated video of a floating train, s what could make the train rise and what could ma track. Students are then introduced to the more g Question they will answer over the course of the u an object move or not move? Students begin by in makes an object start to move. Finding ways to move blocks, students learn that they cannot see the forces they make—forces are not something that can be seen—but students can see the effects of forces when a force causes an object at rest to move. Students point to these effects as evidence of forces. The purpose of this lesson is to engage students in firsthand experiences with forces and to provide them with practice in evidence-based thinking.

Unit Anchor Phenomenon: The floating train rises, floats above the track, then later falls back to the track.

Chapter-level Anchor Phenomenon: The train rises above the track.

Investigative Phenomenon: Objects (e.g., blocks, dominos, balloons, rubber bands) start to move in different ways (e.g., a block starts to move when it is pulled by a rubber band).

Class Observation Table: Completed

Video: Floating Train

Balancing Forces Investigation Notebook, page 2

Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

Materials & Preparation

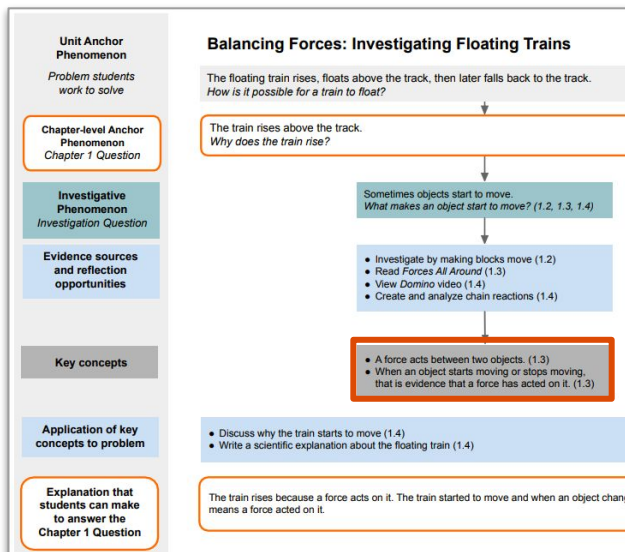
Materials

For the Classroom Wall

- Unit Question: *What can make an object move or not move?*
- Chapter 1 Question: *Why does the train rise?*
- section headers: Key Concepts, Vocabulary
- vocabulary: *force*

Lesson Brief:

Key Concepts



Coherence
Flowchart

Lesson
Overview
Compilation

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

Lesson Overview Compilation

Lessons in This Unit

Chapter 1 Lessons

- Lesson 1.1: Pre-Unit Assessment
- Lesson 1.2: Making an Object Move
- Lesson 1.3: Forces All Around
- Lesson 1.4: Explaining Forces and the Train

Chapter 2 Lessons

- Lesson 2.1: Discovering Non-Touching Forces
- Lesson 2.2: What Objects Do Magnetic Forces Act On?
- Lesson 2.3: Investigating Ways Magnetic Force Moves Objects
- Lesson 2.4: What My Sister Taught Me About Magnets
- Lesson 2.5: Explaining Magnetic Force and the Train

Chapter 3 Lessons

- Lesson 3.1: Observing Evidence of Gravity
- Lesson 3.2: Reading About Gravity
- Lesson 3.3: Observing Forces in Chain Reactions
- Lesson 3.4: Modeling and Explaining the Falling Train

Chapter 4 Lessons

- Lesson 4.1: One Object, Two Forces
- Lesson 4.2: Investigating Balanced Forces
- Lesson 4.3: Explaining a Bridge
- Lesson 4.4: Modeling and Explaining Balanced Forces

Chapter 5 Lessons

- Lesson 5.1: Investigating Unbalanced Forces
- Lesson 5.2: Hoverboard
- Lesson 5.3: Electromagnets and Predicting Patterns
- Lesson 5.4: Modeling the Train
- Lesson 5.5: End-of-Unit Assessment: Students' Explanations

Chapters at a Glance

Unit Question

What can make an object move or not move?

Chapter 1: Why does the train rise?

Chapter Question

Why does the train rise?

Investigation Questions

- What makes an object start to move? (1.2, 1.3, 1.4)

Key Concepts

- A force acts between two objects. (1.3)

Materials & Preparation

Materials

For the Classroom Wall

- key concept: A force acts between two objects.
- key concept: When an object starts moving or stops moving, that is evidence that a force has acted on it.

Materials and
Preparation

Digging in to chapter 1

Group Work time

1. Form groups of 3 or 4
2. Each group will pick a lesson in Chapter 1 (1.1 - 1.4)
3. Chart the activities in the lesson. Be sure to include:
 - a. Purpose of lesson
 - b. Modalities of each activity
 - c. Vocabulary introduced
 - d. Key Concepts introduced
4. Be prepared for group to **demonstrate** at least one activity in the lesson.



Presentations



Chapters

Chapter 1: Why does the train rise? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Making an Object Move



LESSON 1.3
Forces All Around



LESSON 1.4
Explaining Forces and the
Train

Unit Anchor Phenomenon

Problem students work to solve

Chapter-level Anchor Phenomenon
Chapter 1 Question

Investigative Phenomenon
Investigation Question

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to problem

Explanation that students can make to answer the Chapter 1 Question

Balancing Forces: Investigating Floating Trains

The floating train rises, floats above the track, then later falls back to the track.
How is it possible for a train to float?

The train rises above the track.
Why does the train rise?

Sometimes objects start to move.
What makes an object start to move? (1.2, 1.3, 1.4)

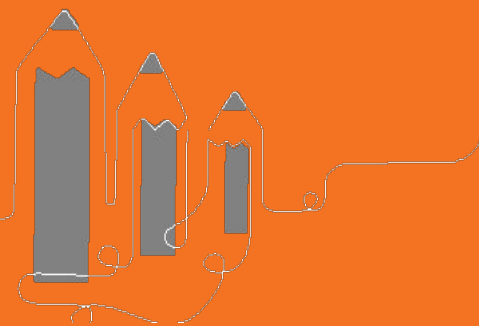
- Investigate by making blocks move (1.2)
- Read *Forces All Around* (1.3)
- View *Domino* video (1.4)
- Create and analyze chain reactions (1.4)

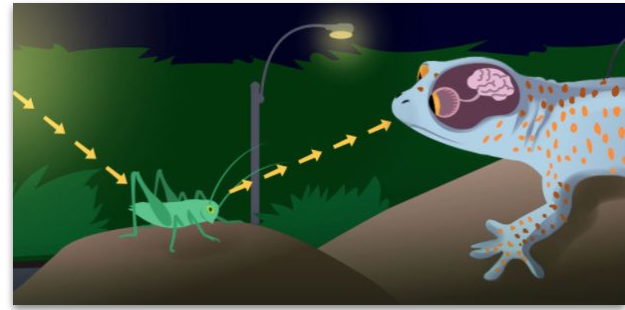
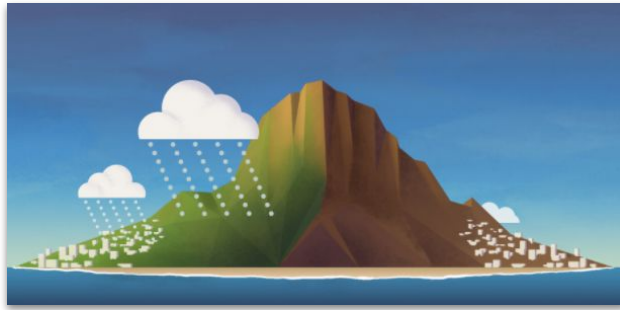
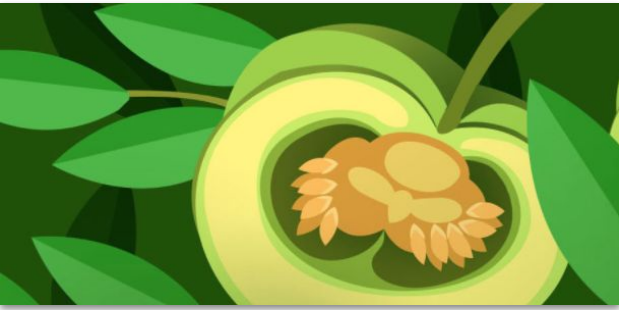
- A force acts between two objects. (1.3)
- When an object starts moving or stops moving, that is evidence that a force has acted on it. (1.3)

- Discuss why the train starts to move (1.4)
- Write a scientific explanation about the floating train (1.4)

The train rises because a force acts on it. The train started to move and when an object changes how it is moving, that means a force acted on it.

Break



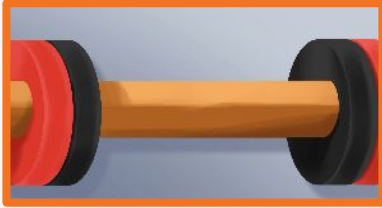


Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- **Model Lesson**
- Multimodal Instruction
- Digging into Chapter 2

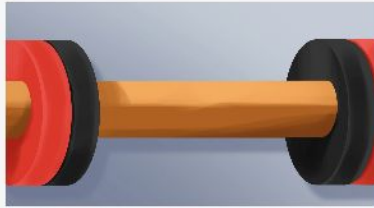
Balancing Forces: Chapter 2

Chapter 2: Why does the train rise without anything touching it? ⓘ



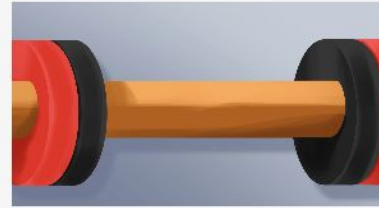
LESSON 2.1

Discovering Non-Touching Forces



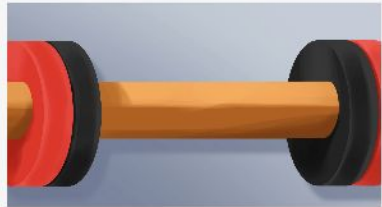
LESSON 2.2

What Objects Do Magnetic Forces Act On?



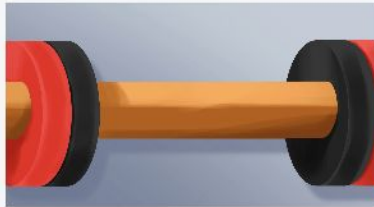
LESSON 2.3

Investigating Ways Magnetic Force Moves Objects



LESSON 2.4

What My Sister Taught Me About Magnets



LESSON 2.5

Explaining Magnetic Force and the Train

4 Easy Steps to teaching a lesson

DIRECTIONS:

1. Download the **Classroom Slides** for **Lesson 1.1** and review them.
2. Read the **Overview**.
3. Explore the **Materials & Preparation** document.
4. Read the **Differentiation** document.

AmplifyScience > Balancing Forces > Chapter 1 > Lesson 1.1

Lesson 1.1: Pre-Unit Assessment

Lesson Brief (2 Activities) | T TEACHER The Floating Train Video | 1 WRITING Students Write Initial Explanations | 2 TEACHER LED DISCUSSION Introducing Investigation Notebooks

RESET LESSON

GENERATE PRINTABLE LESSON GUIDE

Overview

Students watch a short video about a floating train and write their initial explanations about what they think makes the train rise, float, and then fall. Figuring out how the floating train works is the problem students will solve in this unit. The explanations they provide today serve as a Pre-Unit Assessment for formative purposes, designed to

Digital Resources

- Classroom Slides 1.1 | PowerPoint
- Classroom Slides 1.1 | Google Slides
- Classroom Videos 1.1 | Zip

Arrows 1-4 point to the following elements:

- 1: Classroom Slides 1.1 | PowerPoint
- 2: Overview
- 3: Materials & Preparation
- 4: Differentiation

Unit: Balancing Forces

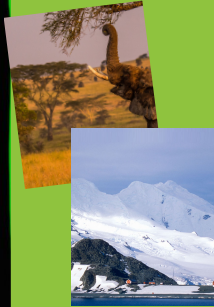
Lesson: 2.1

Purpose: The purpose of this lesson is to introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit.

Materials and Preparation: Immediately Before the Lesson

1. Write the Investigation Question on the board. Write “How can a force act without objects touching?”
2. Post the following:
Magnet Anticipatory Chart
3. Have on hand the following materials:
materials for the classroom wall
bags of student investigation materials
ring magnets
masking tape
marker

Balancing Forces



Unit Question: What can make an object move or not move?

Chapter 1 Question: Why does the train rise?

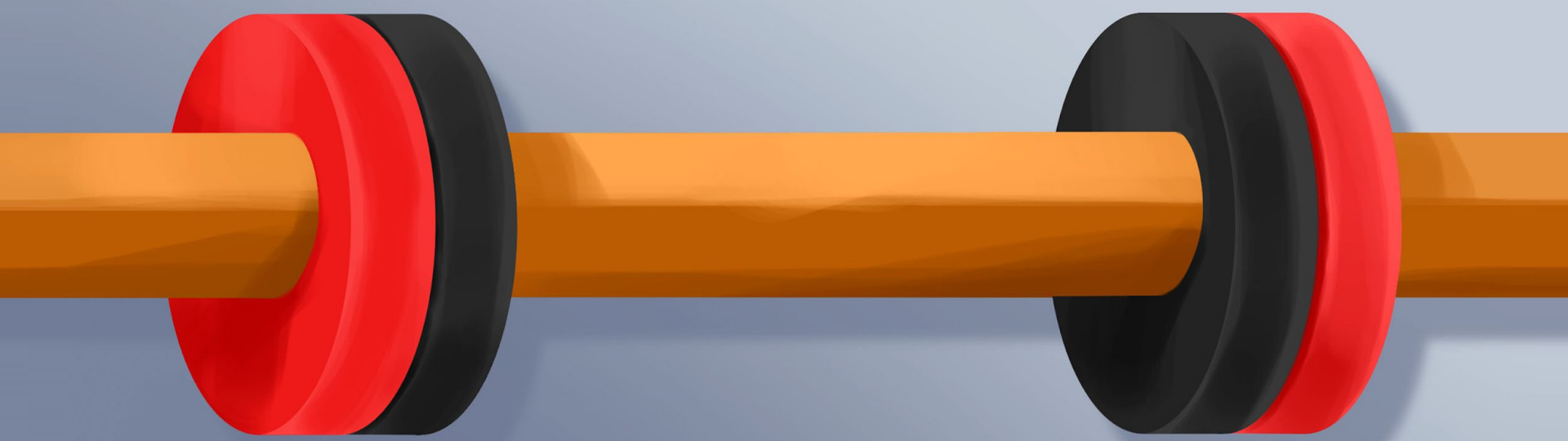
Key Concepts

#1- A force acts between two objects.

#2. When an object starts moving or stops moving, that is evidence that a force has acted on it.

Vocabulary

force



Grade 3 | Balancing Forces

Lesson 2.1: Discovering Non-Touching Forces

Activity 1

Investigating Non-Touching Forces





We discovered that there must be a force that makes the train rise off the tracks, but people in Faraday are still worried.



Chapter 2 Question

Why does the train rise without anything touching it?



Our Experiences

What We Think We Know

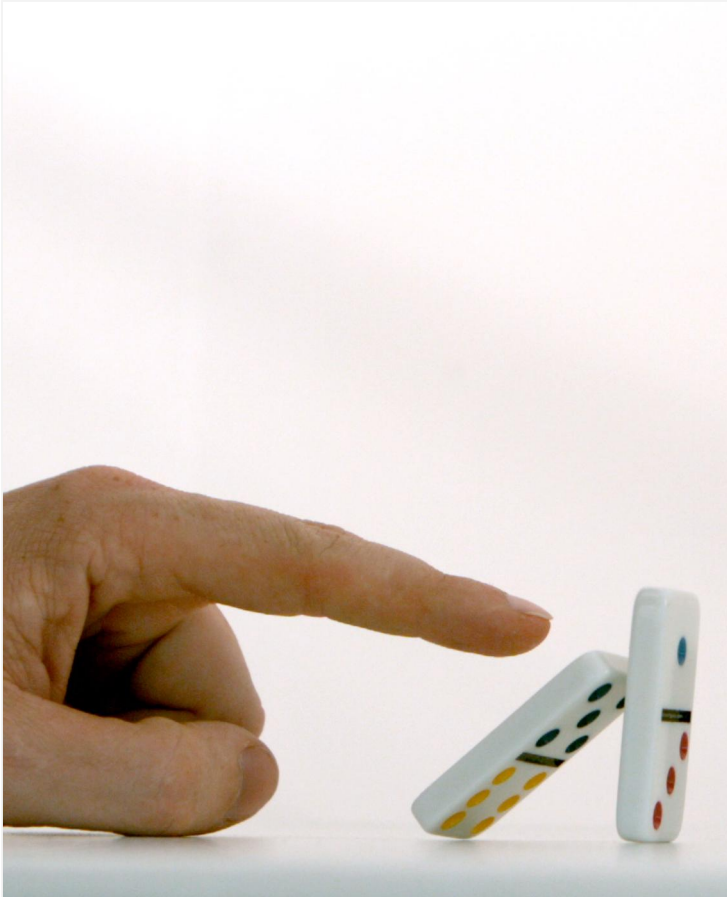
Let's connect our question to the experiences and ideas on our charts.



Which experiences and ideas help you understand why the train rises **without anything touching it?**

Today, we are going to investigate this question:

How can a force act without objects touching?



What have we learned is evidence of a force?

Evidence of a force is _____.



We will investigate with these objects to see if we can see evidence of a force acting **without objects touching**.

Setting a Purpose for Investigating and Reading

| Investigating | Reading |
|---|---------|
| Find evidence of a force acting without objects touching. | |

Today, we will focus on making an object **start** moving without anything touching it.



What could you do with the materials in order to investigate and search for evidence of non-touching forces?



Try to find evidence of a force making an object start moving without anything touching the object.

Activity 2

Making Sense of Magnet Observations





Can a force make an object start to move without anything touching the object?

What is your evidence?

Vocabulary



touching force

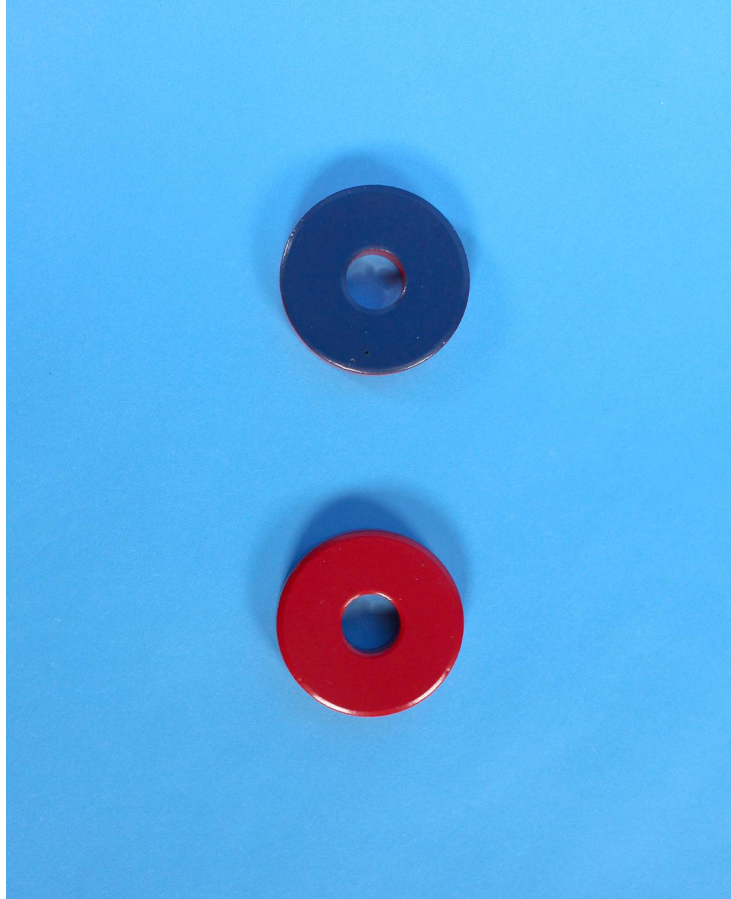
a force that acts between objects that are touching each other

Vocabulary



non-touching force

a force that acts between objects
that are not touching each other



The pull when two magnets come together is a non-touching force even though the magnets end up touching.

Key Concept

Some forces happen between objects that are touching. Other forces happen between objects that are not touching.

Name: _____ Date: _____

Evidence of Non-Touching Forces

- Directions:
- 1. Answer the question below and then record your evidence.
 - 2. Use the words in the Word Bank when you record your evidence.

Can a force make an object start to move without anything touching the object? _____

| Word Bank | | | | | | | |
|----------------|--------------------|--------------|-----------------------|---------|--------|--|--|
| force | magnet | changed | push | pull | rolled | | |
| touching force | non-touching force | slid | moved | started | | | |
| stopped | jumped | When I . . . | I observed that . . . | | | | |

What is your evidence? _____

Turn to page 13 in your notebooks.

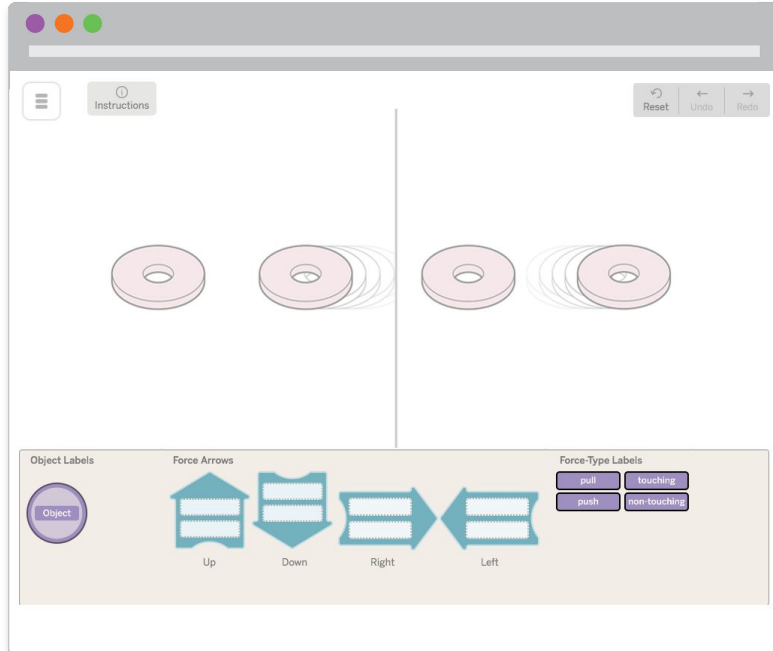


Answer the question. Then record evidence from your observations or observations your classmates described.

Activity 3

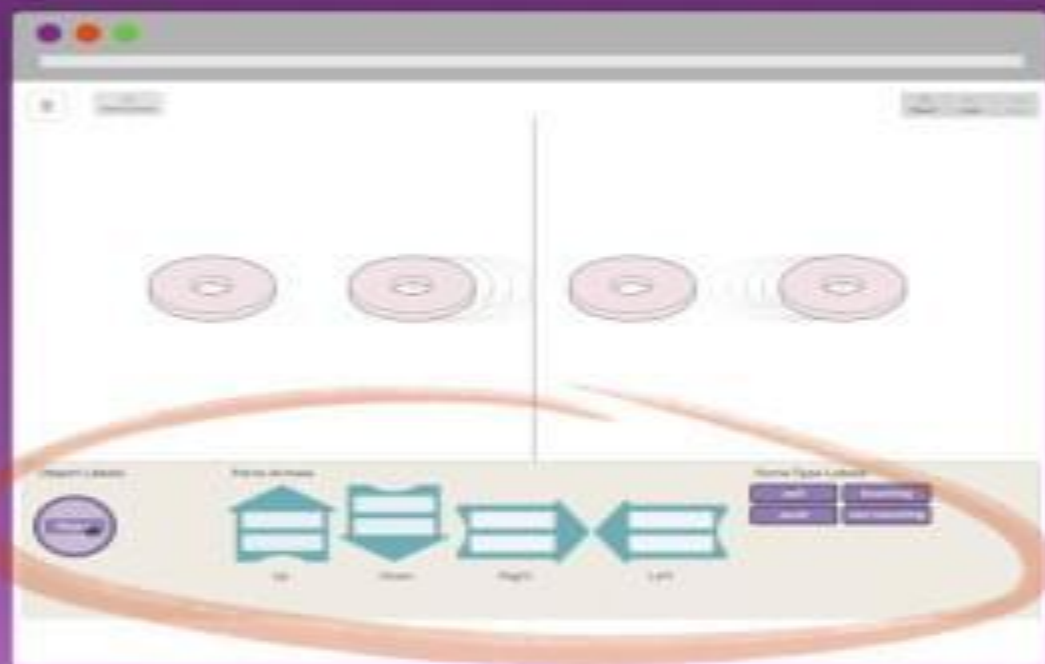
Diagramming Magnetic Forces

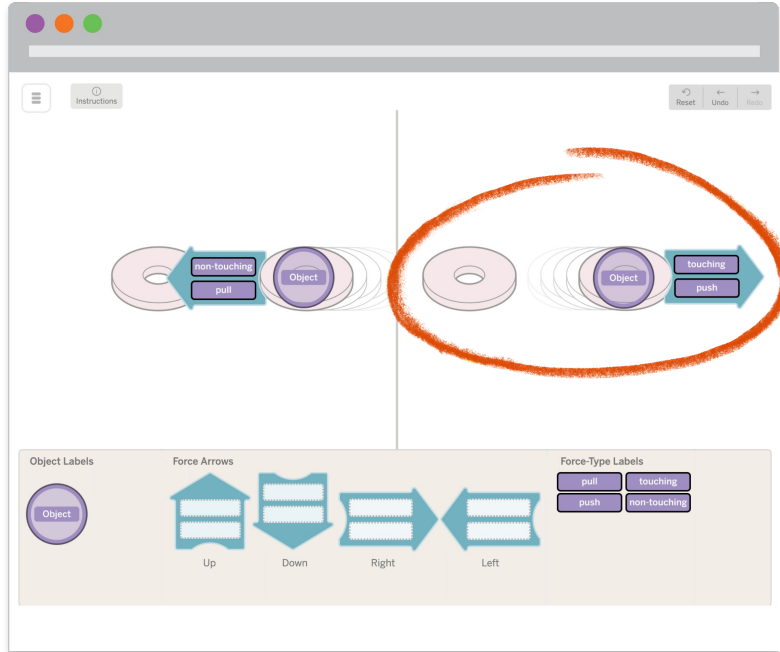




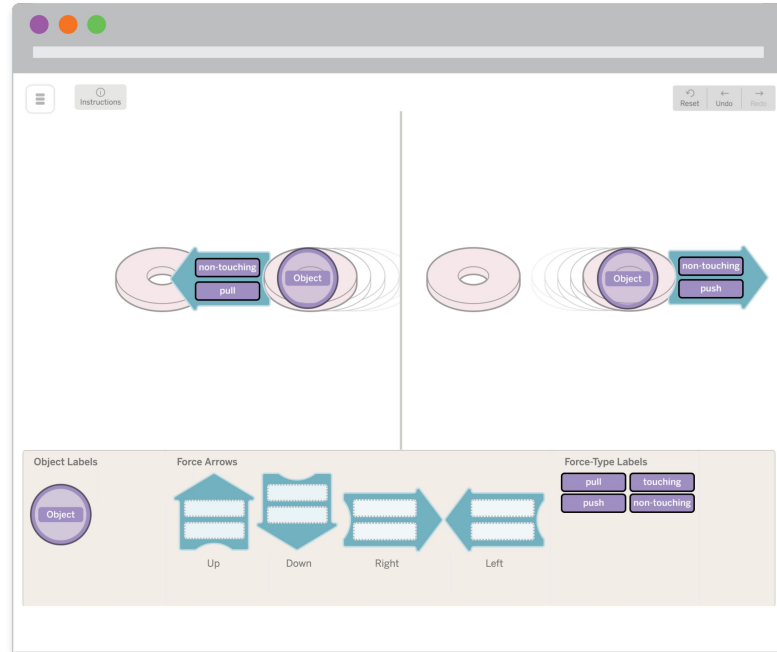
We will use this diagramming tool to show what can happen between two magnets.

We will use **labels** to identify what is going on in the diagram



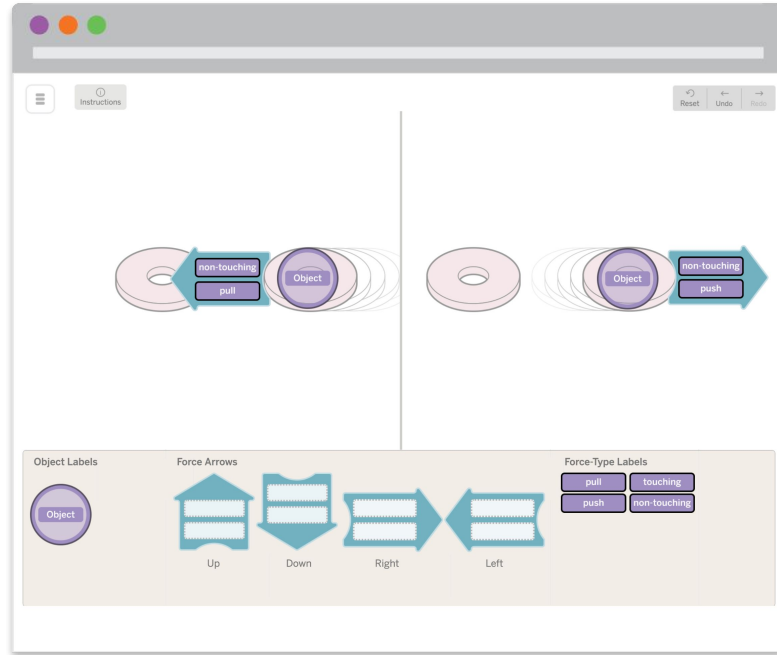


Are these two magnets pushing apart with a touching force?



We should use the non-touching label instead.

The magnet started moving even though the other magnet did not touch it.



While the objects in our model don't move, and we can only show the objects provided, the model will help us think about real objects in our investigations.

Vocabulary



diagram

an illustration that shows how something works or
what its parts are

Activity 4

Activating Prior Knowledge about Magnets




Magnet Anticipatory Chart

| What we think we know about magnets | Questions we have about magnets |
|-------------------------------------|---------------------------------|
| | |

On this chart, we'll record many ideas. Later we can check if we still think those ideas are true.

Magnet Anticipatory Chart

| What we think we know about magnets | Questions we have about magnets |
|---|---------------------------------|
|  | |

© 2016 The Regents of the University of California


Thinking about our ideas and questions makes it easier to learn new ideas.



What ideas do you have about magnets?

What do you already know or think you know?

Magnet Anticipatory Chart

| What we think we know about magnets | Questions we have about magnets |
|-------------------------------------|---|
| |  |



What questions do you have about magnets?

What do you wonder about them?

End of Lesson



THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

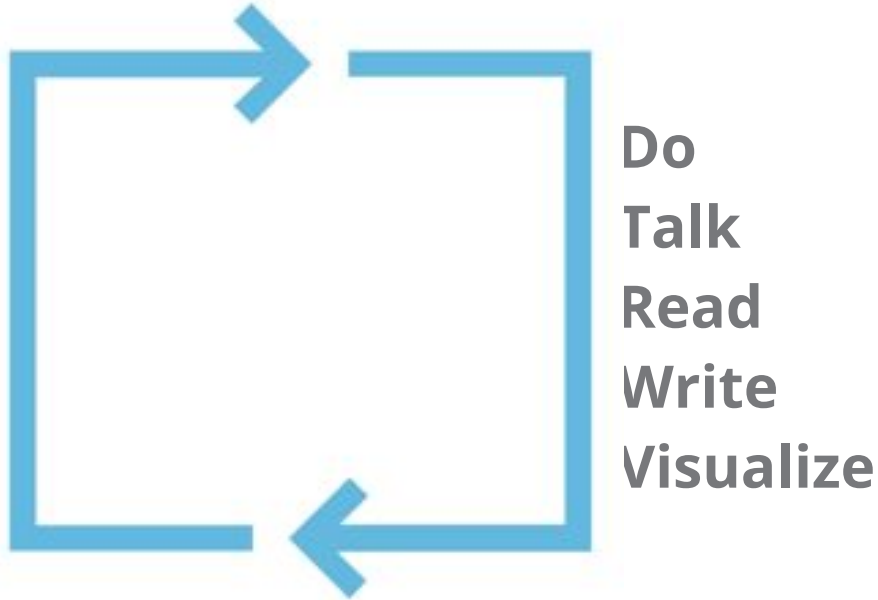
Amplify.

Published and Distributed by Amplify. www.amplify.com

Balancing Forces

Over the course of the unit, through **firsthand experiences, discourse, and reading and writing informational text** students will come to understand how forces can cause stability or change in an object's motion. They will discover how magnetic force can be used to counterbalance the force of gravity. They will create physical models, diagram models, and write, and present scientific explanations detailing how the maglev (magnetic levitation) train appears to defy gravity by floating.

Lesson 2.1 Multimodal learning



Balancing Forces

Investigation Question: How can a force act without objects touching?



Key concepts:

- Some forces happen between objects that are touching.
- Non-touching forces can act between magnets and some, but not all. Other objects.



What might be challenging about this content?

Balancing Forces Lesson 2.1

Hands on: Discover non-touching objects with magnets

Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching.

- 2 ring magnets
- 1 small paper clip, 1 steel spoon, 1 plastic spoon, 1 washer, 1 piece of wood, 1 balloon, 1 penny

Students discover this can happen between magnets and some other objects.



Balancing Forces Lesson 2.1

Write: record evidence of your observations

Record evidence of
non-touching forces.

Name: _____ Date: _____

Evidence of Non-Touching Forces

Directions:

1. Answer the question below and then record your evidence.
2. Use the words in the Word Bank when you record your evidence.

Can a force make an object start to move without anything touching
the object? _____

Word Bank

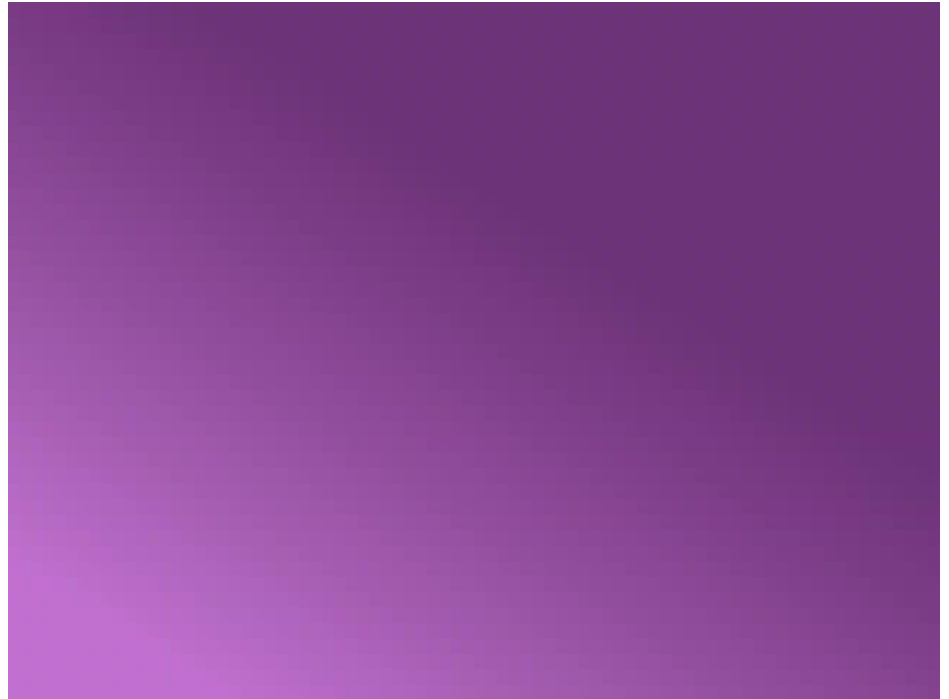
| | | | | | |
|----------------|--------------------|--------------|-----------------------|---------|--------|
| force | magnet | changed | push | pull | rolled |
| touching force | non-touching force | slid | moved | started | |
| stopped | jumped | When I . . . | I observed that . . . | | |

What is your evidence? _____

Balancing Forces Lesson 2.1


Students use the digital tool to investigate moving non touching objects with magnets.

Digital Investigation: Non-touching objects with magnets



Balancing Forces Lesson 2.1

Talk: What ideas do you have about magnets?

| Magnet Anticipatory Chart | |
|---|---------------------------------|
| What we think we know about magnets | Questions we have about magnets |
|  | |

Thinking about our ideas and questions makes it easier to learn new ideas.

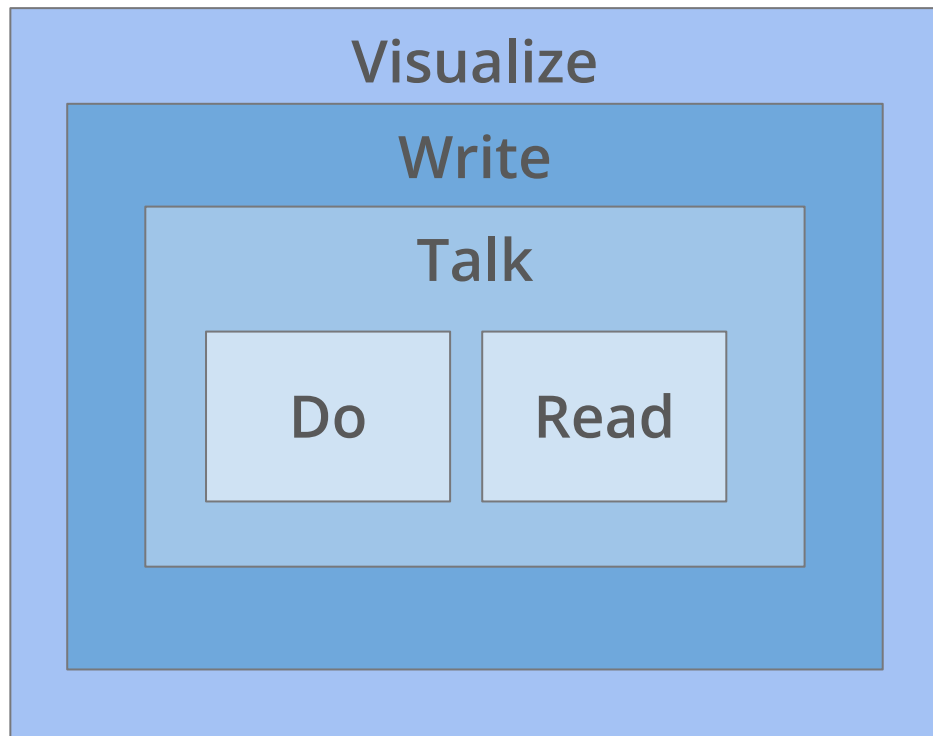


What ideas do you have about magnets?

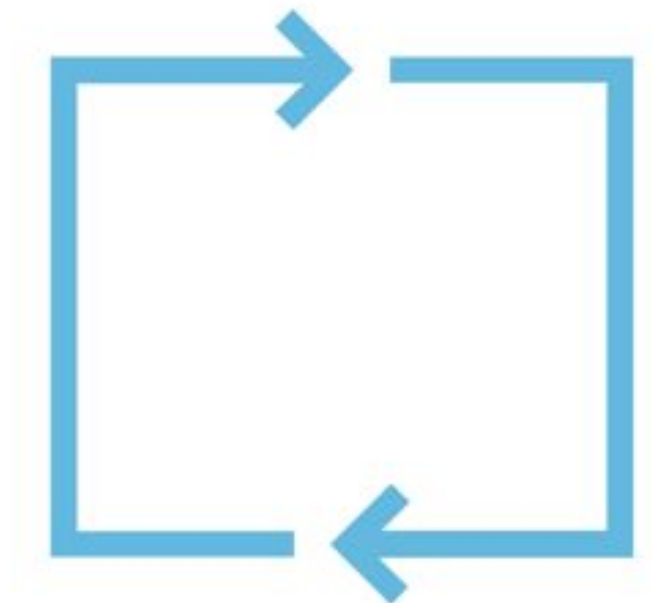
What do you already know or think you know?

Multimodal instruction (multiple at bats)

Activities of different modalities are intentionally sequenced to support deep understanding of complex concepts.



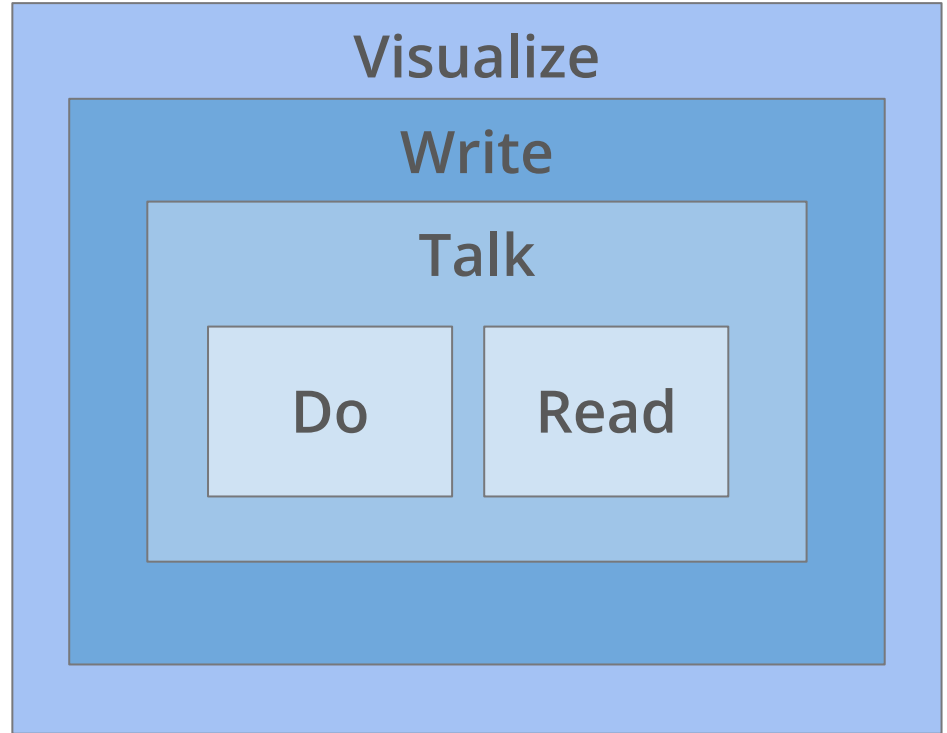
Lesson 2.1 Multimodal learning



- Do** Investigating non touching forces
- Talk** Making sense of Magnet Observations
- Read**
- Write** Record evidence from observations
- Visualize** Modeling tool "Diagramming Magnetic Forces"

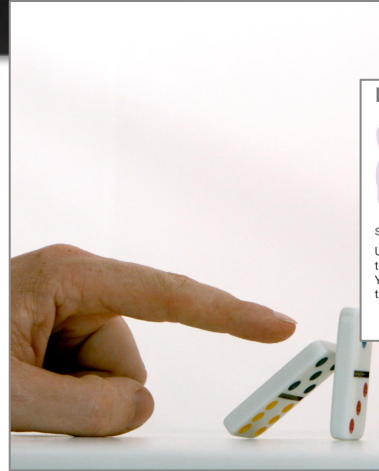
Reflection

How will multiple at-bats with multimodal evidence sources support diverse learners in your class to master complex science ideas?



Evidence sources work together

Teacher tip: Every evidence source plays an important role in student learning. Be sure to teach every activity in order!



Instructions for Chain Reactions



Step 1
Use materials in the bag to make a chain reaction. You do not have to use all the materials.

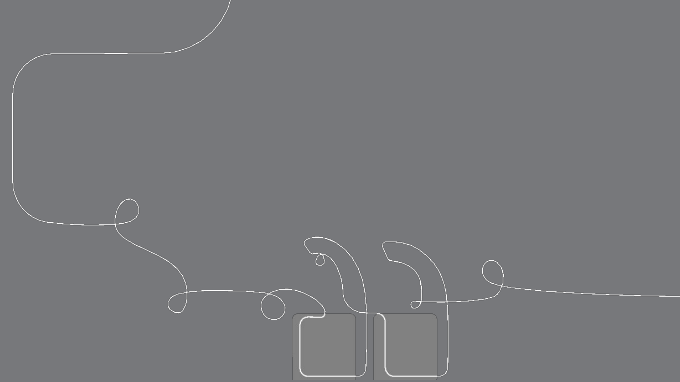


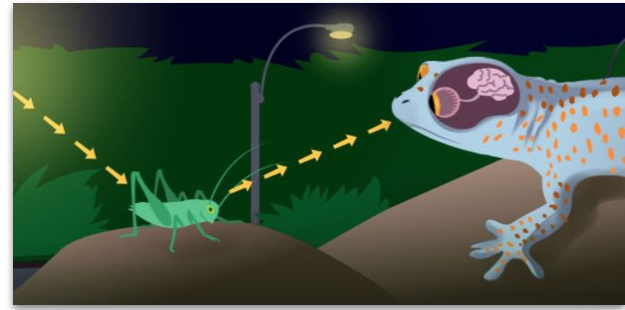
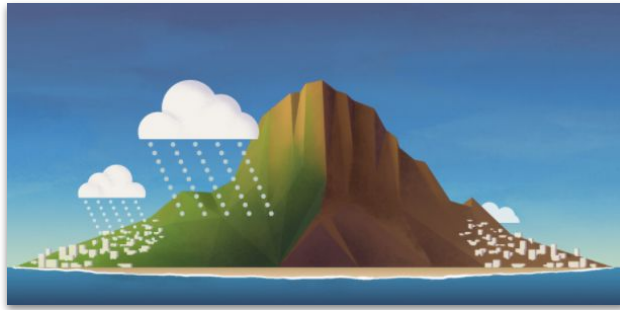
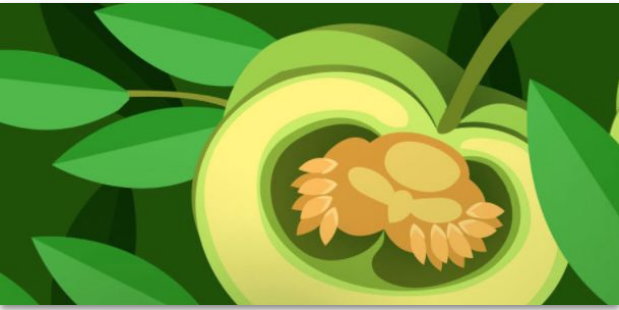
Step 2
Your finger can push the first object. That object should make another object move.



Step 3
See how many forces you can have happen in your chain reaction.

Questions?



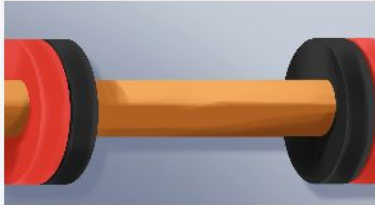


Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Multimodal Instruction
- Digging into Chapter 2

Balancing Forces: Chapter 2

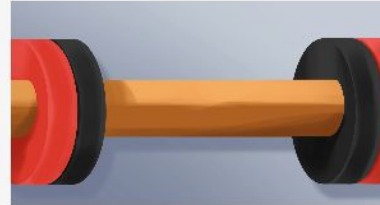
Chapter 2: Why does the train rise without anything touching it? ⓘ



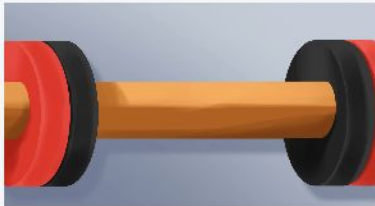
LESSON 2.1
Discovering Non-Touching
Forces



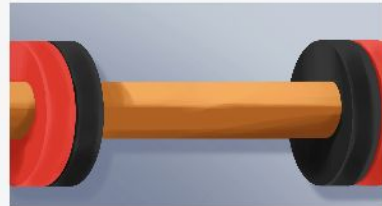
LESSON 2.2
What Objects Do Magnetic
Forces Act On?



LESSON 2.3
Investigating Ways
Magnetic Force Moves
Objects



LESSON 2.4
What My Sister Taught Me
About Magnets



LESSON 2.5
Explaining Magnetic Force
and the Train

Digging into Chapter 2

Group Work time

1. In your group, pick a lesson in Chapter 2 (from 2.1 to 2.5)
2. Using the **classroom slides**, each group member will present an activity
3. Be prepared to **teach** at least 1 activity in the lesson.
4. Remember to state the purpose of the lesson



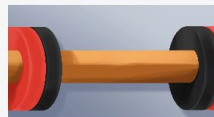
Presentations



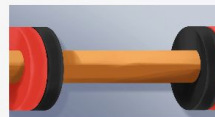
Chapter 2: Why does the train rise without anything touching it? ⓘ



LESSON 2.1
Discovering Non-Touching
Forces



LESSON 2.2
What Objects Do Magnetic
Forces Act On?



LESSON 2.3
Investigating Ways
Magnetic Force Moves
Objects



LESSON 2.4
What My Sister Taught Me
About Magnets



LESSON 2.5
Explaining Magnetic Force
and the Train

Unit Anchor Phenomenon

Problem students work to solve

Chapter-level Anchor Phenomenon
Chapter 2 Question

Investigation Question

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to problem

Explanation that students can make to answer the Chapter 2 Question

Balancing Forces: Investigating Floating Trains

The floating train rises, floats above the track, then later falls back to the track.
How is it possible for a train to float?

The train rises above the track without anything touching it.
Why does the train rise without anything touching it?

How can a force act without objects touching?
(2.1, 2.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- Discover non-touching forces with magnets (2.1)
- Discuss evidence about non-touching forces (2.1)
- Make digital diagrams (models) of forces (2.1)
- Investigate which objects magnetic forces act on (2.2)
- Read about forces in *Handbook of Forces* (2.2)

- Some forces happen between objects that are touching. Other forces happen between objects that aren't touching. (2.1)
- Non-touching forces can act between magnets and some, but not all, other objects. (2.2)

- Think-Pair-Share about the floating train (2.5)
- Make a model of the train rising (2.5)
- Write a scientific explanation about why the train rises without anything touching it (2.5)

The train rises because of a magnetic repelling force. There must be a magnet in the train and in the track.

In what ways can magnetic forces make an object move? (2.3, 2.4)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- Investigate magnetic forces with magnets (2.3)
- Read about magnets in *Handbook of Forces* (2.3)
- Read *What My Sister Taught Me About Magnets* (2.4)
- Discuss forces using unit vocabulary (2.5)

- Magnets can attract or repel other magnets. (2.4)
- Magnets can attract some metal objects. (2.4)

Questions?



Goals for the day:

By the end of the day, you will:

- ✓ Experience how all the instructional components fit together in the context of the unit
- ✓ Gain a deeper understanding of the purposeful sequencing of each activity and lesson within a chapter
- ✓ Become more familiar with multimodal instruction and how it provides multiple at bats to support student success

e



LAUSD SUMMER SYMPOSIUM 2023

Session 2 (after lunch)
UCLA Center X Presentation

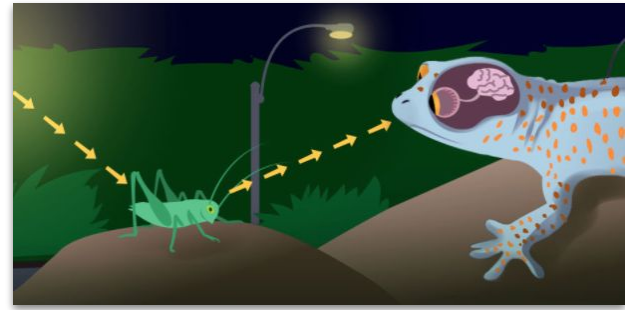
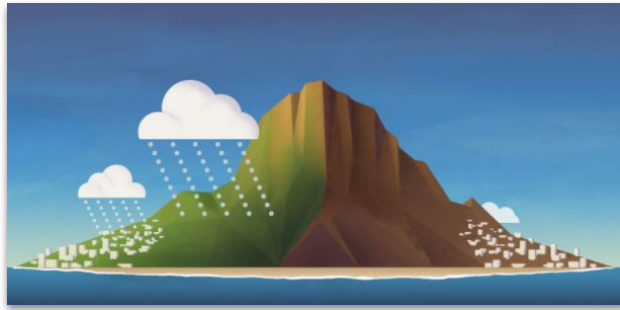
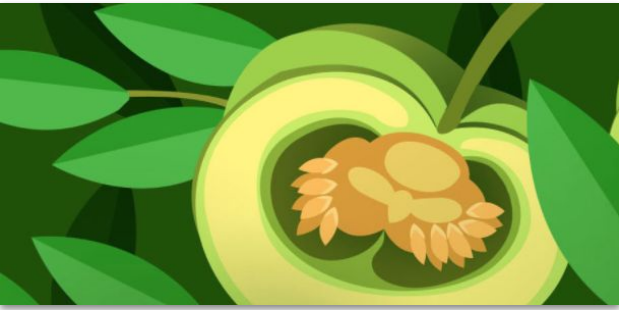


Lunch Break

LAUSD SUMMER SYMPOSIUM 2023

Session 3 Preparation, Planning & Pacing





Plan for the day

- Independent Planning
 - Reviewing Planning Protocols and Resources
 - Independent Planning
 - Share Out
- Closing

Preparation



Navigating to the Materials and Preparation

The screenshot shows the Amplify Science California website. The navigation menu on the left includes: Unit Overview, Chapters, Printable Resources, Planning for the Unit, Teacher References, and Offline Preparation. An orange arrow points from the 'Printable Resources' link to the 'Materials and Preparation' section of the website. The 'Materials and Preparation' section is titled 'Materials and Preparation' and includes a 'Materials at a Glance' section with a note about safety regulations and a list of items provided in the kit. Below this is a 'Preparation at a Glance' section with a note about the information provided and two tables showing preparation time frames for Chapter 1 and Chapter 2.

Balancing Forces

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

What's in This Unit?

Scientists and engineers have figured out speeds. Using similar principles, engineers than rolling along the ground. In the *Balancing Forces* unit, students will come to understand how they can use the same principles to design a train that seems to defy logic. Over the course of the unit, students will come to understand how they can use the same principles to design a train that seems to defy logic. Over the course of the unit, students will come to understand how they can use the same principles to design a train that seems to defy logic.

Read more

Chapters

Chapter 1: Why does the train move?

LESSON 1.1 Pre-Unit Assessment

LESSON 1.2 Making a Train

LESSON 1.3 Explaining Forces and the Train

Materials and Preparation

Materials at a Glance

Note: Check and follow your district's safety regulations pertaining to the use of proper safety equipment and procedures for students participating in hands-on science activities. Please refer to the *Science Safety Handbook for California Public Schools*, California Department of Education (2014).

Items Provided in the *Balancing Forces* Kit

This is a complete list of all the kit-provided materials needed to present the unit twice for a class of 36 students. For reordering information, call Amplify Science at 800-421-0000.

Note: Your Amplify Science kit may contain additional quantities of some items.

| Quantity needed | Manipulatives |
|-----------------|-------------------------------------|
| 1 | aluminum foil, roll* |
| 38 | bags, plastic with zip* |
| 18 | balls, rubber, small |
| 19 | balloons, medium size |
| 2 | batteries, D-cell* |
| 38 | blocks, wooden |
| 1 | bolt, iron |
| 18 | cardboard, pieces, 2" x 2" |
| 18 | cardboard, pieces, 3.5" x 2" |
| 18 | cardboard, pieces, 7" x 3.5" |
| 20 | clothespins, wood, with wire hinges |
| 18 | cups, plastic, 16 oz. |
| 19 | dominoes, plastic, small |
| 10 | fasteners (brads), brass plated |
| 10 | fasteners (brads), solid brass |
| 38 | hooks, with pointed screw tips |
| 108 | index cards* |
| 38 | magnets, ring |

Preparation at a Glance

The information provided here is an overview of the amount of time we estimate it will take you to prepare the materials for each lesson of the *Balancing Forces* unit. This does not include the time you will need to spend reading the instructional guide; previewing the student activities, student books, videos, or apps; or reviewing students' work.

The Materials and Preparation sections in the Lesson Brief of each lesson (in the instructional guide) include detailed preparation steps to be completed before the day of each lesson as well as steps to be done immediately before each lesson. This preparation time is summarized in the tables below to assist in your planning. We suggest actually calendaring your lessons, taking particular note of the lessons that require more preparation time.

Asterisks in the tables denote that preparations for those lessons have self-contained tasks that are easily handed off to adult volunteers. Doing so can reduce or eliminate prep time in those instances. Plan ahead by inviting adult volunteers to come in a few days before these lessons. **Note:** Amount of time listed for each lesson is the total estimated amount of preparation time needed and not just the time for any self-contained task(s) listed.

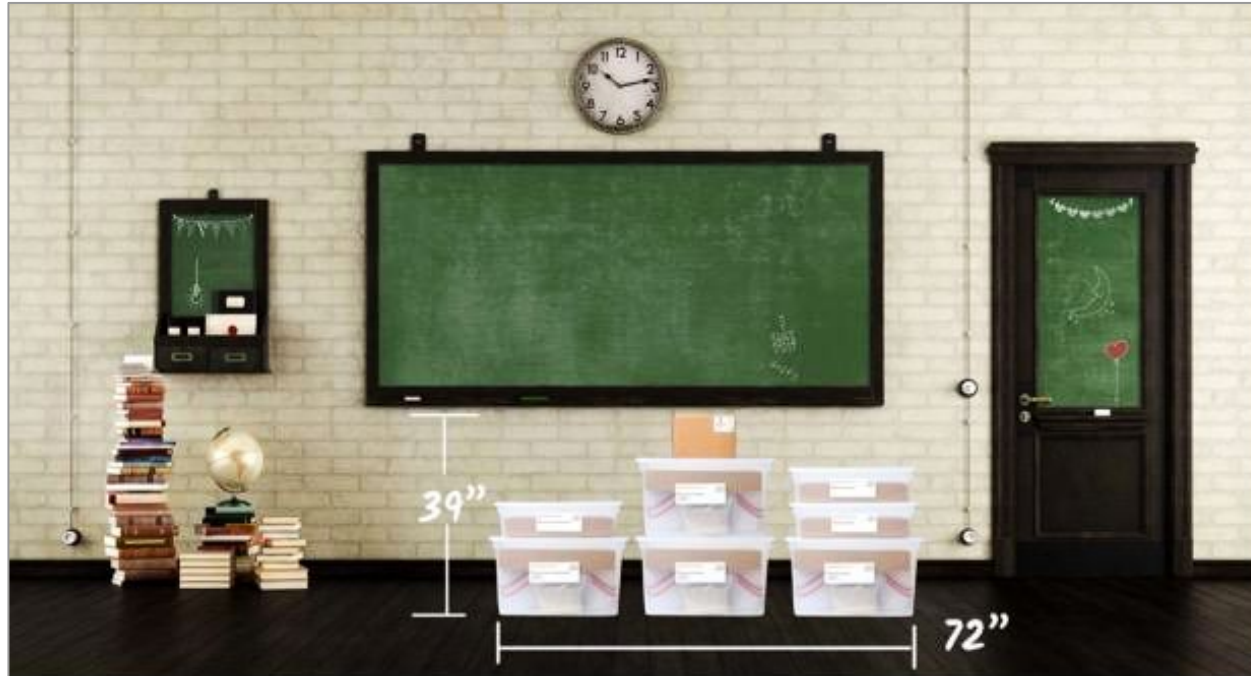
Chapter 1

| Lesson | Title | Preparation time frame (in minutes) |
|--------|---|---|
| 1.1 | Pre-Unit Assessment: Students' Initial Explanations | 10 |
| 1.2 | Making An Object Move | 20-150: Screw hooks into blocks.* Optional: Make copies of the Investigation Notebook if additional copies were not purchased.* |
| 1.3 | Forces All Around | 30: Create class charts/posters.* |
| 1.4 | Explaining Forces and the Train | 20 |

Chapter 2

| Lesson | Title | Preparation time frame (in minutes) |
|--------|---|-------------------------------------|
| 2.1 | Discovering Non-Touching Forces | 20 |
| 2.2 | What Objects Do Magnetic Forces Act On? | 20 |
| 2.3 | Investigating Ways Magnetic Force Moves Objects | 10 |
| 2.4 | What My Sister Taught Me About Magnets | 15 |
| 2.5 | Explaining Magnetic Force and the Train | 20: Prepare pieces of cardboard.* |

Prepping Hands-On Materials for the Unit

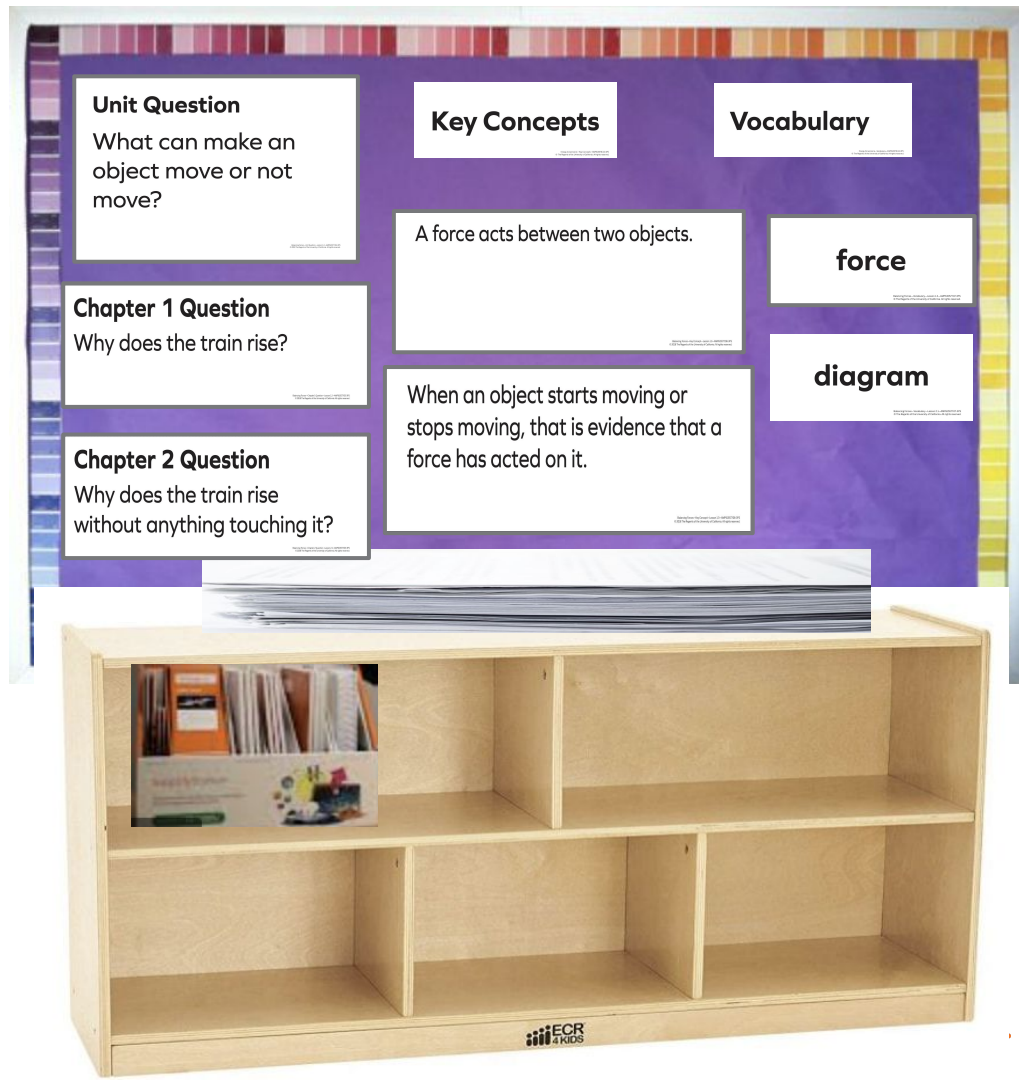


Classroom Kits

Built for a class of 36 students, with consumables for two years

Classroom Wall

- Pull out the Unit Question, key concepts and vocabulary cards.
- Place them on the top of the table or bookcase below your science wall.
- Take books out of the kit and place in the bookcase or on the table. (Always collect books after each lesson use. Return to bookcase so they are easily accessible.)



Investigation Questions

- **Lesson overview compilation** in your print TE or on the digital platform
- Scroll down to find the investigation questions
- *(Note: These questions can also be found on the **coherence flowcharts**)*
- They will be added to the Science Classroom Wall. (After creating all the questions, place them with the chapter questions, etc.)

Chapter 1: Why are wolves different even though they are all the same species?

Chapter Question

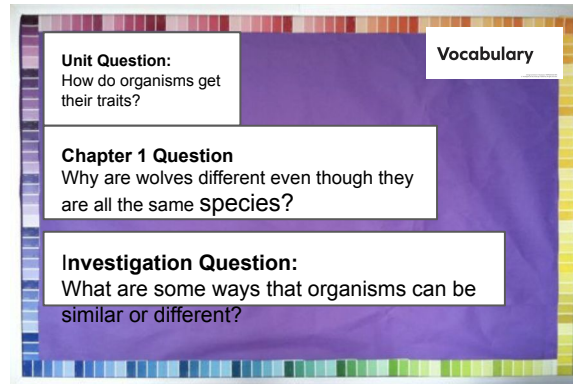
Why are wolves different even though they are all the same species?

Investigation Questions

- What are some ways that organisms can be similar or different? (1.1, 1.2, 1.3, 1.4)
- How can we describe the traits of organisms in a species? (1.5, 1.6)

Key Concepts

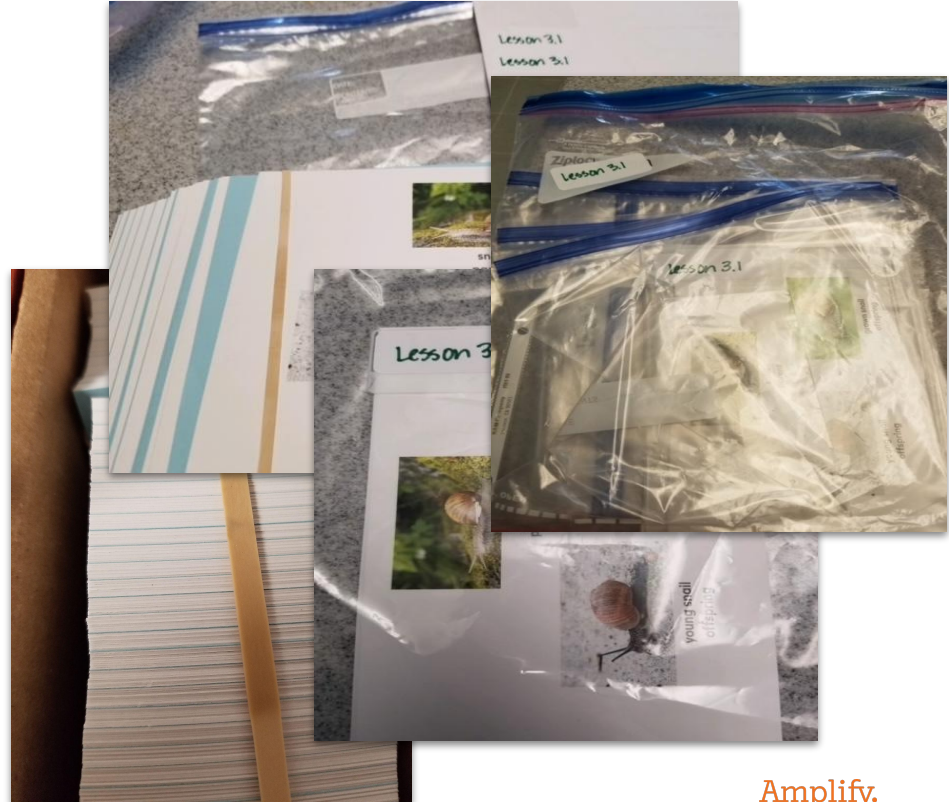
- Organisms have observable traits. (1.3)
- Organisms in a species have many similar traits, but for each trait there can be variation. (1.6)



Cards for games, sorting or matching activities

Organization tips:

- Separate and place in envelopes or bags (or clip together)
- Label the envelopes or bags with the name and lesson # and activity # (ex. Lesson 2.4, Act. 1)
- Put each envelope or bag (1 set) into a bigger bag and label



Hands on material organization

Balancing Forces Planning for the Unit

Materials and Preparation

Materials at a Glance

Note: Check and follow your district's safety regulations pertaining to the procedures for students participating in hands-on science activities. *Plus California Public Schools, California Department of Education (2014)*

Items Provided in the Balancing Forces Kit

This is a complete list of all the kit-provided materials needed to present *Floating Trains* unit twice for a class of 36 students. For reordering inform

Note: Your Amplify Science kit may contain additional quantities of some

| Quantity needed | Manipulatives |
|-----------------|-------------------------------------|
| 1 | aluminum foil, roll* |
| 38 | bags, plastic with zip* |
| 18 | balls, rubber, small |
| 19 | balloons, medium size |
| 2 | batteries, D-cell* |
| 38 | blocks, wooden |
| 1 | bolt, iron |
| 18 | cardboard, pieces, 2" x 2" |
| 18 | cardboard, pieces, 3.5" x 2" |
| 18 | cardboard, pieces, 7" x 3.5" |
| 20 | clothespins, wood, with wire hinges |
| 18 | cups, plastic, 16 oz. |
| 19 | dominoes, plastic, small |

1

Materials and Preparation

| | |
|----------|---------------------------------|
| 10 | fasteners (brads), brass plated |
| 10 | fasteners (brads), solid brass |
| 38 | hooks, with pointed screw tips |
| 108 | index cards* |
| 38 | magnets, ring |
| 200 | paper clips, small |
| 1 | sandpaper, small piece* |
| 10 | spoons, steel |
| 10 | steel wool, pieces |
| 15 | sticks, craft, wooden |
| 105 feet | string |
| 20 | twist ties with iron cores |
| 10 | washers, metal |
| 3 feet | wire, magnet, copper |

*consumable item

| Quantity in kit | Print materials |
|-----------------|---|
| 18 sets | <i>Balancing Forces: Investigating Floating Trains Investigation Notebook</i> |
| 18 sets | Word Relationships Cards: Set 1 (8 cards/set) |
| 18 sets | Word Relationships Cards: Set 2 (3 cards/set) |
| 18 sets | Word Relationships Cards: Set 3 (2 cards/set) |

2

Balancing Forces Planning for the Unit

| 18 sets | Word Relationships Cards: Set 4 (1 card/set) | 5.2 |
|-----------------|--|-----|
| Quantity in kit | Print materials for the classroom wall | Us |
| 4 | Chapter Questions | thr |
| 10 | key concepts | thr |
| 2 | section headers: Key Concepts, Vocabulary | thr |
| 1 | Unit Question | thr |
| 12 | vocabulary cards | thr |

| Quantity in kit | Student books | Us |
|-----------------|---|-----|
| 18 | <i>Explaining a Bridge</i> | 4.3 |
| 18 | <i>Forces All Around</i> | 1.3 |
| 18 | <i>Handbook of Forces</i> | 2.3 |
| 18 | <i>Hoverboard</i> | 5.2 |
| 18 | <i>What My Sister Taught Me About Magnets</i> | 2.4 |

Items to Be Provided By the Teacher

The quantities listed are what you will need to provide to teach the unit once for a class of 36 students. You will need to replenish the consumable items after each class use.

| Quantity needed (1 class) | Description | Us |
|---------------------------|---|-----|
| 36 | books, heavy, or other 1-lb. objects | 3.1 |
| 9 | cardboard tubes (toilet-paper rolls), 4" long (provided in some kits) | 3.3 |
| 1 | hole punch, single | 2.5 |

3

Materials and Preparation

Balancing Forces Planning for the Unit

| | | |
|------|-----------------------------------|--------------------|
| 1 | marker, black | throughout |
| 9 | paper, chart, sheets* | throughout |
| 18 | pencils | 2.5, 3.4, 4.4, 5.4 |
| 10 | pennies | 2.1, 2.2 |
| 20 | rubber bands, thick, medium size* | 1.2, 3.3 |
| 18 | rulers | 5.1 |
| 1 | scissors | throughout |
| 10 | spoons, plastic | 2.1, 2.2 |
| 1 | stapler | 1.1 |
| 1200 | sticky notes, yellow, 3" x 3" ** | throughout |
| 2 | tape, masking, rolls* ** | throughout |

*consumable item

**included in the Amplify Science Starter Kit, if purchased

Preparation at a Glance

The information provided here is an overview of the amount of time we estimate it will take you to prepare the materials for each lesson of the *Balancing Forces* unit. This does not include the time you will need to spend reading the instructional guide; previewing the student activities, student books, videos, or apps; or reviewing students' work.


The Materials and Preparation sections in the Lesson Brief of each lesson (in the instructional guide) include detailed preparation steps to be completed before the day of each lesson as well as steps to be done immediately before each lesson. This preparation time is summarized in the tables below to assist in your planning. We suggest actually calendaring your lessons, taking particular note of the lessons that require more preparation time.

Asterisks in the tables denote that preparations for those lessons have self-contained tasks that are easily handed off to adult volunteers. Doing so can reduce or eliminate prep time in those instances. Plan ahead by inviting adult volunteers to come in a few days before these lessons. **Note:** Amount of time listed for each lesson is the total estimated amount of preparation time needed and not just the time for any self-contained task(s) listed.

4

Hands On Material Organization

Completed for Balancing Forces

| Directions | | | | |
|--|----------|------------|-------------|---|
| 1. Open the Digital Lesson Guides Only page 7 from the Unit Landing page or go the Print TE to page 31. (Chapter 1 Activities) | | | | |
| 2. Look for the lessons with Hands On. | | | | |
| HANDS ON  | | | | |
| 3. Note in the table below. | | | | |
| 4. Review the materials and preparation to determine if it can be prepared prior to the lesson or on the day of the lesson. | | | | |
| 5. Use this same procedure for each Chapter. (Go to the Chapter Activities Contents) | | | | |
| Chapter/Lesson | Activity | Prep Prior | Prep Day of | What to do |
| 1.2 | 2 | X | | First, you will need to screw one hook into the short end of each block. You will also need to provide rubber bands. Assemble one gallon-size self-sealing plastic bag of investigation materials for each pair of students, plus one bag for demonstration purposes. Each bag should contain the following items: • 2 blocks, with hooks • 1 balloon • 1 rubber band • 1 paper clip • 1 domino • 1 clothespin • 1 index card |
| 1.4 | 2 | X | | Make sure you have a bag of materials from Lesson 1.2 for each pair. Add a rubber ball to each bag. |
| 2.1 | 1 | X | | For each group of four students prepare a bag with the following materials: You will pass each group two ring magnets as well. • 1 small paper clip • 1 steel spoon • 1 plastic spoon* • 1 washer • 1 piece of wood (craft stick) • 1 balloon • 1 penny* Create Magnet Anticipatory Chart https://learning.amplify.com/m4c4c0409cedec1c/original/ELSCI_3-PS_CU_126.pdf |
| 2.2 | 1 | X | | Add to bag from lesson 2.1 • 1 brass-plated paper fastener (brad) • 1 solid-brass paper fastener (brad) • 1 twist tie with iron core • 1 piece of steel wool • 1 scrap of aluminum foil |
| 2.3 | 1 | X | | For each pair of students: • 1 copy of Handbook of Forces • 2 ring magnets • 1 small paper clip • 2 sticky notes* |
| 3.1 | 2 | X | | Assemble sets of investigation materials. Each pair of students will need one set of the following investigation materials. • 1 paper clip • 1 domino • 1 heavy book |
| 3.3 | 1 | X | | For each pair of students: • 1 domino • 1 rubber ball • 1 ring magnet • 1 ball magnet • 1 ramp (cardboard half-pipe) • 1 folded index card • 1 paper clip • 1 piece of wood (craft stick) • 1 steel spoon • 1 washer • 2 wooden blocks with hooks • 1 cardboard half-pipe • 1 rubber band* |
| 4.1 | 2 | X | | Each pair of students will receive one set of investigation materials: • 2 ring magnets • 1 pencil • 1 piece of string (8 inches long) • 4 pieces of masking tape (1 inch each) |
| 4.2 | 1 | X | | For Each Pair of Students: • 2 ring magnets • 1 large pieces of cardboard (7" x 3.5") • 1 small pieces of cardboard (3.5" x 2") • 1 plastic cup • 1 paper clip with a piece of string (about 8" long) tied to it • several pieces of masking tape • 4 sticky notes • 1 copy of Handbook of Forces |

Balancing Forces charts

Overview

Students are introduced to their role as scientists and to the problem they will tackle in this unit—explaining how floating trains work. After seeing a short animated video of a floating train, students wonder what could make the train rise and what could make it fall back to the track. Students are then introduced to the more general Unit Question they will answer over the course of the unit: *What can make an object move or not move?* Students begin by investigating what makes an object start to move. Finding ways to move blocks, students learn that they cannot see the forces they make—forces are not something that can be seen—but students can see the effects of forces when a force causes an object at rest to move. Students point to these effects as evidence of forces. The purpose of this lesson is to engage students in firsthand experiences with forces and to provide them with practice in evidence-based thinking.

Unit Anchor Phenomenon: The floating train rises, floats above the track, then later falls back to the track.

Chapter-level Anchor Phenomenon: The train rises above the track.

Investigative Phenomenon: Objects (e.g., blocks, dominos, balloons, rubber bands) start to move in different ways (e.g., a block starts to move when it is pulled by a rubber band).

Students learn:

- Scientists gather information by making observations.
- Compiling many observations in a table makes it easier to look for patterns.
- An object can start moving when it is pushed or pulled by another object. This push or pull is called a force.

Digital Resources

 Classroom Slides 1.2 | PowerPoint

 Classroom Slides 1.2 | Google Slides


 All Projections

 Classroom Videos 1.2 | Zip

 Class Observation Table: Completed

 Video: Floating Train

 Balancing Forces Investigation Notebook, page 2

 Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds



Charts for Balancing Forces, Grade 3 Unit 1

| Lesson | Chart: Some charts are completed over the course of the unit, others are as is. | Link (Completed charts) |
|--------|---|---|
| 1.2 | Classroom Observation Table | https://learning.amplify.com/m/6f8c990201ae7ade/original/ELSCI_3-PS_CU_197.pdf |
| 1.3 | Setting a Purpose for Investigating and Reading | https://learning.amplify.com/m/1eb7d0f02854553/original/ESSCI_3-PS_CU_124.pdf |
| 2.1 | Magnet Anticipatory Chart | https://learning.amplify.com/m/4c4cd409cedeac1c/original/ELSCI_3-PS_CU_126.pdf |
| 2.2 | Items Attracted and Not Attracted to a Magnet chart | https://learning.amplify.com/m/7e7cc63b74f2703c/original/ELSCI_3-PS_CU_249.pdf |
| 2.2 | What Objects does Magnetic Force Act on? chart | https://learning.amplify.com/m/6140fbabe1cf4db/original/ESSCI_3PS_NA_1866.pdf |
| 3.1 | Gravity Anticipatory Chart | https://learning.amplify.com/m/55601645b229db75/original/ELSCI_3-PS_CU_196.pdf |

On linked charts some information is added with the students input.

Pacing



Quick check:

Lesson timing and pacing

How much time do you have in your schedule for each science lesson?



Navigating to the Lesson at a Glance

Lesson 2.1: Discovering Non-Touching Forces

Printable Lesson Guide

STUDENT-TO-STUDENT DISCUSSION Making Sense of Magnet Observations

3 MODELING TOOL Diagramming Magnetic Forces

4 TEACHER ACTIVATION Activating Prior Knowledge about Magnets

RESET LESSON

Overview

Materials & Preparation

Differentiation

Standards

Vocabulary

Unplugged?

Students discover that some forces can be exerted between two objects without the objects touching. Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects. Students discuss and gather about non-touching forces of the Force Diagramming Tool to Students activate their prior knowledge anticipatory chart. The purpose of students to magnets, magnetic force important concepts they will investigate.

Unit Anchor Phenomenon: The field track, then later falls back to the track.

Overview

Students discover that some forces can be exerted between two objects without the objects touching. Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects. Students discuss and gather about non-touching forces of the Force Diagramming Tool to Students activate their prior knowledge anticipatory chart. The purpose of students to magnets, magnetic force important concepts they will investigate.

Unit Anchor Phenomenon: The field track, then later falls back to the track.

Chapter-level Anchor Phenomenon: Investigative Phenomenon without anything touching

Students learn:

- Some forces can act non-touching forces
- Magnets can cause them. This non-touching
- Scientists investigate
- Scientists use evidence questions.
- Diagrams are pictures of ideas about how something happen.

Lesson at a Glance

1: Investigating Non-Touching Forces (20 min.)

Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects.

2: Making Sense of Magnet Observations (20 min.)

Through discussion and writing, students conclude that magnetic force is a non-touching force. Students practice using evidence. This activity provides an On-the-Fly Assessment of students' understanding that non-touching forces can occur.

3: Diagramming Magnetic Forces (10 min.)

The teacher introduces the practice of modeling. The teacher also introduces a digital app for making force diagrams, which students will use throughout the unit.

4: Activating Prior Knowledge about Magnets (10 min.)

Sharing ideas and questions about magnets prepares students for further learning about this topic. This activity provides an On-the-Fly Assessment for understanding the amount of experience and knowledge students have with magnets.

Digital Resources

Lesson at a Glance

1: Investigating Non-Touching Forces (20 min.)

Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects.

2: Making Sense of Magnet Observations (20 min.)

Through discussion and writing, students conclude that magnetic force is a non-touching force. Students practice using evidence. This activity provides an On-the-Fly Assessment of students' understanding that non-touching forces can occur.

3: Diagramming Magnetic Forces (10 min.)

The teacher introduces the practice of modeling. The teacher also introduces a digital app for making force diagrams, which students will use throughout the unit.

4: Activating Prior Knowledge about Magnets (10 min.)

Sharing ideas and questions about magnets prepares students for further learning about this topic. This activity provides an On-the-Fly Assessment for understanding the amount of experience and knowledge students have with magnets.

Lesson at a Glance

Pacing and Timing

Considerations:

- Are there activities that might take slightly more or less time?
- Should you split the lesson over two days?

Overview

Materials & Preparation

Differentiation

Standards

Vocabulary

Unplugged?

Lesson at a Glance

1: Investigating Non-Touching Forces (20 min.)

Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects.

2: Making Sense of Magnet Observations (20 min.)

Through discussion and writing, students conclude that magnetic force is a non-touching force. Students practice using evidence. This activity provides an On-the-Fly Assessment of students' understanding that non-touching forces can occur.

3: Diagramming Magnetic Forces (10 min.)

The teacher introduces the practice of modeling. The teacher also introduces a digital app for making force diagrams, which students will use throughout the unit.

4: Activating Prior Knowledge about Magnets (10 min.)

Sharing ideas and questions about magnets prepares students for further learning about this topic. This activity provides an On-the-Fly Assessment for understanding the amount of experience and knowledge students have with magnets.

Lesson at a Glance

Pacing and Timing

Lesson at a Glance - Pacing

Day 1: (40 minutes)

- Investigation Non-Touching Force (20 min)
- Making Sense of Magnet Observations (20 min)

Day 2: (20 minutes)

- Diagramming Magnetic Force (10 min)
- Activating Prior Knowledge about Magnets (10 min)

Overview

Materials & Preparation

Differentiation

Standards

Vocabulary

Unplugged?

Lesson at a Glance

1: Investigating Non-Touching Forces (20 min.)

Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects.

2: Making Sense of Magnet Observations (20 min.)

Through discussion and writing, students conclude that magnetic force is a non-touching force. Students practice using evidence. This activity provides an On-the-Fly Assessment of students' understanding that non-touching forces can occur.

3: Diagramming Magnetic Forces (10 min.)

The teacher introduces the practice of modeling. The teacher also introduces a digital app for making force diagrams, which students will use throughout the unit.

4: Activating Prior Knowledge about Magnets (10 min.)

Sharing ideas and questions about magnets prepares students for further learning about this topic. This activity provides an On-the-Fly Assessment for understanding the amount of experience and knowledge students have with magnets.

Planning for Pacing - Balancing Forces (Example)

| Sample time in my Science block. | Day 1 (40 min) | Day 2 (20 min) | Day 3 (25 min) | Day 4 (35 min) | Day 5 (30 min) |
|--|---|--|---|---|--|
| | 2.1: Discovering Non-Touching Forces Activity 1: investigating Non-touching Forces (20 min) Activity 2: Making Sense of Magnet Observations (20 min) | 2.1: cont. Activity 3: Diagramming Magnetic Forces (10 min) Activity 4: Activating Prior Knowledge about Magnets (10 min) | 2.2: What Objects do Magnetic Forces Act On? Activity 1: Investigating What Objects Magentic Forces Act On (25 min) | 2.2: cont. Activity 2: Discussing What Objects Magnetic Forces Act On (20 min) Activity 3: Reading Handbook of Forces (15 min) | 2.3: Investigating Ways Magnetic Force Moves Objects Activity 1: Exploring Forces with Magnet Tricks (15 min) Activity 2: Sharing and Discussing Magnet Tricks (15 min) |

Week __ Pacing

| Monday | Tuesday | Wednesday | Thursday | Friday |
|--------|---------|-----------|----------|--------|
| | | | | |

Planning



4 Easy Steps to planning a lesson

DIRECTIONS:

1. Download the **Classroom Slides** and review them.
2. Read the **Overview**.
3. Explore the **Materials & Preparation** document.
4. Read the **Differentiation** document.

Lesson 2.1:
Discovering Non-Touching Forces

Printable Lesson Guide

STUDENT-TO-STUDENT DISCUSSION
Making Sense of Magnet Observations

3 MODELING TOOL
Diagramming Magnetic Forces

4 TEACHER-LED DISCUSSION
Activating Prior Knowledge about Magnets

RESET LESSON

Overview

Overview

Students discover that some forces can act without objects touching. Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects. Students discuss and write about the evidence they gather about non-touching forces. The teacher then models the use of the Force Diagramming Tool to diagram two magnetic forces. Students activate their prior knowledge about magnets by using an anticipatory chart. The purpose of this lesson is to introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit.

Unit Anchor Phenomenon: The floating train rises, floats above the track, then later falls back to the track.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Classroom Videos 2.1 | Zip
- Setting a Purpose for Investigating and Reading: Completed
- Magnet Anticipatory Chart
- Balancing Forces Investigation Notebook, pages 12–13

Download Classroom Slides

My Drive > **Balancing Forces**

Type ▾ People ▾ Modified ▾

Name ↑

BF Chapter 1

BF Chapter 2

BF Chapter 3

BF Chapter 4

BF Chapter 5

My Drive > Balancing Forces > **BF Chapter 1**

Type ▾ People ▾ Modified ▾ [\(Send feedback to Google\)](#)

Name ↑

| | | |
|--|-------------------------------------|--|
| | Kochi Lesson 1.2 - Balancing Forces | |
| | Kochi Lesson 1.3 - Balancing Forces | |
| | Kochi Lesson 1.3 - Balancing Forces | |
| | Kochi Lesson 1.4 - Balancing Forces | |

4 Easy Steps to planning a lesson

DIRECTIONS:

1. Download the **Classroom Slides** and review them.
2. Read the **Overview**.
3. Explore the **Materials & Preparation** document.
4. Read the **Differentiation** document.

The screenshot shows the Lesson 2.1 interface for "Discovering Non-Touching Forces". At the top, there is a title bar with the lesson title and a "Printable Lesson Guide" button. Below this is a navigation bar with four tabs: "STUDENT-TO-STUDENT DISCUSSION Making Sense of Magnet Observations", "MODELING TOOL Diagramming Magnetic Forces", "TEACHER-LED DISCUSSION Activating Prior Knowledge about Magnets", and a fourth tab. The main content area is divided into three sections: "RESET LESSON", "Overview", and "Digital Resources". The "Overview" section contains a paragraph of text about magnetic forces. The "Digital Resources" section lists various resources like "Classroom Slides 2.1 | PowerPoint", "Classroom Slides 2.1 | Google Slides", "All Projections", "Classroom Videos 2.1 | Zip", "Setting a Purpose for Investigating and Reading: Completed", "Magnet Anticipatory Chart", and "Balancing Forces Investigation Notebook, pages 12-13".

Lesson 2.1:
Discovering Non-Touching Forces

Printable Lesson Guide

STUDENT-TO-STUDENT DISCUSSION Making Sense of Magnet Observations

MODELING TOOL Diagramming Magnetic Forces

TEACHER-LED DISCUSSION Activating Prior Knowledge about Magnets

RESET LESSON

Overview

Students discover that some forces can act without objects touching. Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects. Students discuss and write about the evidence they gather about non-touching forces. The teacher then models the use of the Force Diagramming Tool to diagram two magnetic forces. Students activate their prior knowledge about magnets by using an anticipatory chart. The purpose of this lesson is to introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit.

Unit Anchor Phenomenon: The floating train rises, floats above the track, then later falls back to the track.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Classroom Videos 2.1 | Zip
- Setting a Purpose for Investigating and Reading: Completed
- Magnet Anticipatory Chart
- Balancing Forces Investigation Notebook, pages 12-13

Navigating to the Lesson 2.1 Materials & Prep

The screenshot shows the Lesson 2.1 interface. At the top, the title "Lesson 2.1: Discovering Non-Touching Forces" is displayed. Below it is a "Printable Lesson Guide" button. The interface is divided into four main sections: "HANDS-ON: Investigating Non-Touching Forces", "STUDENT-TO-STUDENT DISCUSSION: Making Sense of Magnet Observations", "MODELING TOOL: Diagramming Magnetic Forces", and "TEACHER-LED DISCUSSION: Activating Prior Knowledge about Magnets". A "RESET LESSON" button is located in the bottom left. On the left sidebar, the "Overview Materials & Preparation" link is circled in orange. The "Overview" section on the right provides a brief description of the lesson. A "Digital Resources" section lists "Classroom Slides 2.1 | PowerPoint" and "Classroom Slides 2.1 | Google Slides". An overlay box on the right, titled "Immediately Before the Lesson", contains three numbered steps for preparation.

Lesson 2.1: Discovering Non-Touching Forces

Printable Lesson Guide

Overview Materials & Preparation

Overview

Students discover that some forces can act without objects touching. Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects. Students discuss and write about the evidence they gather about non-touching forces. The teacher then models the use

Immediately Before the Lesson

1. **Write the Investigation Question on the board.** Write "How can a force act without objects touching?"
2. **Post the following:**
 - Magnet Anticipatory Chart
3. **Have on hand the following materials:**
 - materials for the classroom wall
 - bags of student investigation materials
 - ring magnets
 - masking tape
 - marker

Unit: Balancing Forces

Lesson: 2.1

Purpose: The purpose of this lesson is to introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit.

Materials and Preparation: Immediately Before the Lesson

1. Write the Investigation Question on the board. Write “How can a force act without objects touching?”
2. Post the following:
Magnet Anticipatory Chart
3. Have on hand the following materials:
materials for the classroom wall
bags of student investigation materials
ring magnets
masking tape
marker

4 Easy Steps to planning a lesson

DIRECTIONS:

1. Download the **Classroom Slides** for **Lesson 1.1** and review them.
2. Read the **Overview**.
3. Explore the **Materials & Preparation** document.
4. Read the **Differentiation** document.

The screenshot shows the interface for Lesson 2.1: Discovering Non-Touching Forces. At the top, there's a title bar with a 'Printable Lesson Guide' button. Below this is a navigation bar with four tabs: 'STUDENT-TO-STUDENT DISCUSSION Making Sense of Magnet Observations', '3 MODELING TOOL Diagramming Magnetic Forces', '4 TEACHER-LED DISCUSSION Activating Prior Knowledge about Magnets', and a 'RESET LESSON' button. The main content area is divided into three sections: 'Overview', 'Materials & Preparation', and 'Differentiation'. The 'Overview' section contains a paragraph about the lesson's purpose and a 'Unit Anchor Phenomenon'. The 'Materials & Preparation' section lists 'Standards', 'Vocabulary', and 'Unplugged?'. The 'Differentiation' section is currently empty. On the right side, there's a 'Digital Resources' section with links to 'Classroom Slides 2.1 | PowerPoint', 'Classroom Slides 2.1 | Google Slides', 'All Projections', 'Classroom Videos 2.1 | Zip', 'Setting a Purpose for Investigating and Reading: Completed', 'Magnet Anticipatory Chart', and 'Balancing Forces Investigation Notebook, pages 12-13'. Four numbered orange arrows point to specific elements: Arrow 1 points to the 'Classroom Slides 2.1 | PowerPoint' link. Arrow 2 points to the 'Overview' section header. Arrow 3 points to the 'Materials & Preparation' section header. Arrow 4 points to the 'Differentiation' section header.

Lesson 2.1: Discovering Non-Touching Forces

Printable Lesson Guide

STUDENT-TO-STUDENT DISCUSSION Making Sense of Magnet Observations

3 MODELING TOOL Diagramming Magnetic Forces

4 TEACHER-LED DISCUSSION Activating Prior Knowledge about Magnets

RESET LESSON

Overview

Students discover that some forces can act without objects touching. Students plan and conduct investigations to test if a force can be exerted between two objects without the objects touching. They discover that this can indeed happen between magnets and some other objects. Students discuss and write about the evidence they gather about non-touching forces. The teacher then models the use of the Force Diagramming Tool to diagram two magnetic forces. Students activate their prior knowledge about magnets by using an anticipatory chart. The purpose of this lesson is to introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit.

Unit Anchor Phenomenon: The floating train rises, floats above the track, then later falls back to the track.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Classroom Videos 2.1 | Zip
- Setting a Purpose for Investigating and Reading: Completed
- Magnet Anticipatory Chart
- Balancing Forces Investigation Notebook, pages 12-13

Edit Classroom Slides

- text
- sentence frames
- visuals
- videos
- teacher notes

The screenshot displays the Kami digital editor interface. At the top, the title bar reads 'Copy of Lesson 2.1 - Balancing Forces' with standard file editing menus (File, Edit, View, Insert, Format, Slide, Arrange, Tools, Extensions, Help) and a 'kami' logo. Below the title bar is a toolbar with icons for various editing functions. The main workspace shows a presentation slide with a blue background and a large orange cylinder with two red rings. The slide text reads: 'Grade 3 | Balancing Forces', 'Lesson 2.1: Discovering Non-Touching Forces', and 'AmplifyScience' in the bottom right corner. On the left side, there is a vertical list of slide thumbnails numbered 1 through 7. At the bottom of the interface, there is a light blue box containing the following text: 'Lesson purpose: To introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit. Please refer to this lesson's Materials & Preparation section in the digital Teacher's Guide or the Print Teacher's Guide for information about preparing to teach this lesson, including any applicable safety notes. Below are links to resources used in this lesson.' followed by three links: 'Completed: Setting a Purpose for Investigating and Reading chart', 'Magnet Anticipatory Chart', and 'Balancing Forces Investigation Notebook, pages 12–13'.

Copy of Lesson 2.1 - Balancing Forces

File Edit View Insert Format Slide Arrange Tools Extensions Help

Search Menus

Background Layout Theme Transition

1 Lesson 2.1: Discovering Non-Touching Forces

2 Lesson 2.1: Discovering Non-Touching Forces

3 Lesson 2.1: Discovering Non-Touching Forces

4 Chapter 1 Overview

5 Lesson 2.1: Discovering Non-Touching Forces

6 Lesson 2.1: Discovering Non-Touching Forces

7 Lesson 2.1: Discovering Non-Touching Forces

Grade 3 | Balancing Forces

Lesson 2.1: Discovering Non-Touching Forces

AmplifyScience


Lesson purpose: To introduce students to magnets, magnetic force, and non-touching forces—important concepts they will investigate further throughout the unit

Please refer to this lesson's Materials & Preparation section in the digital Teacher's Guide or the Print Teacher's Guide for information about preparing to teach this lesson, including any applicable safety notes. Below are links to resources used in this lesson.

[Completed: Setting a Purpose for Investigating and Reading chart](#)

[Magnet Anticipatory Chart](#)

[Balancing Forces Investigation Notebook, pages 12–13](#)

8  What have you learned is evidence of a force?

Chapter 2 Question

Why does the train rise without anything touching it?

James W. Dreyer / The Teaching Forum

Setting a Purpose for Investigating and Reading

| Investigating | Reading |
|--|---------|
| Find evidence of a text's varying cultural or genre tradition. | |

Today, we will focus on making an object **start** moving without anything touching it.

10

Lesson 22: Discovering the Touching Force

Vocabulary

touching force

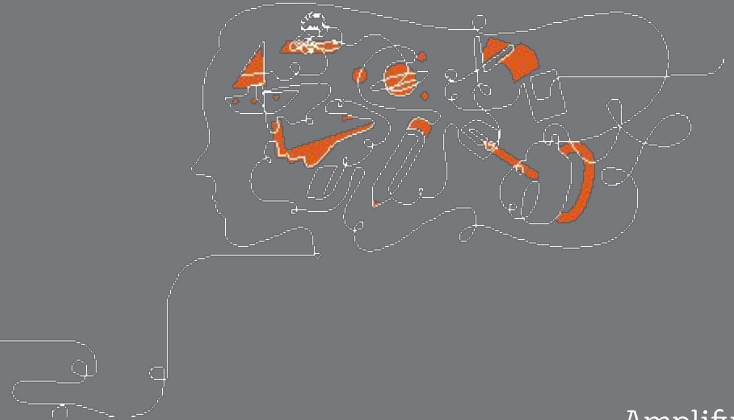
a force that acts between objects that are touching each other

15

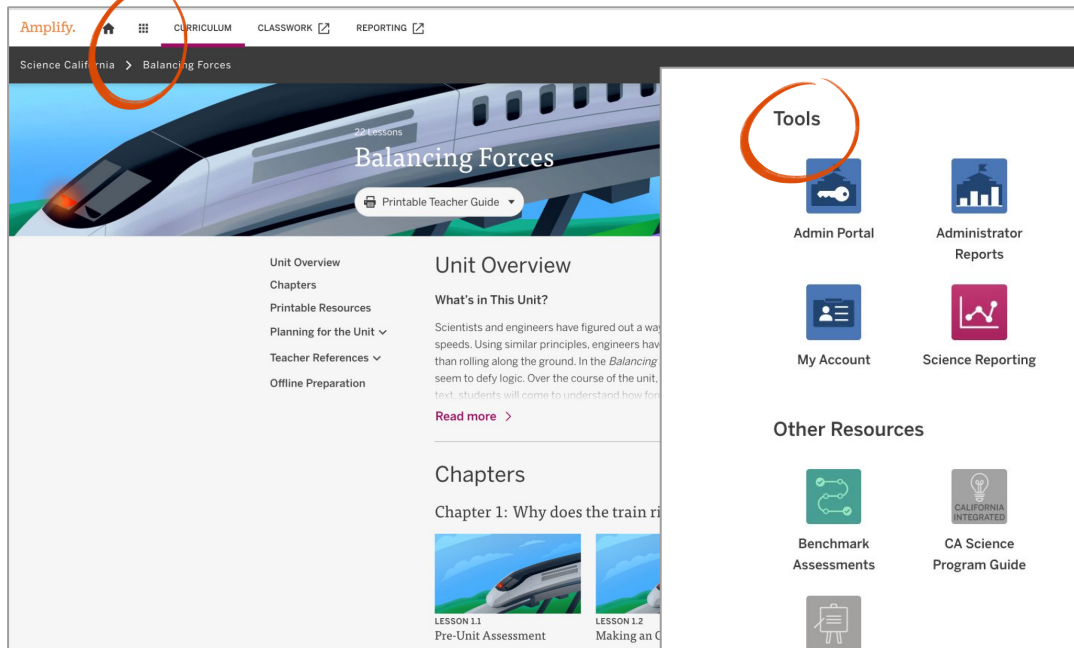
Activity 3
Diagramming Magnetic Forces



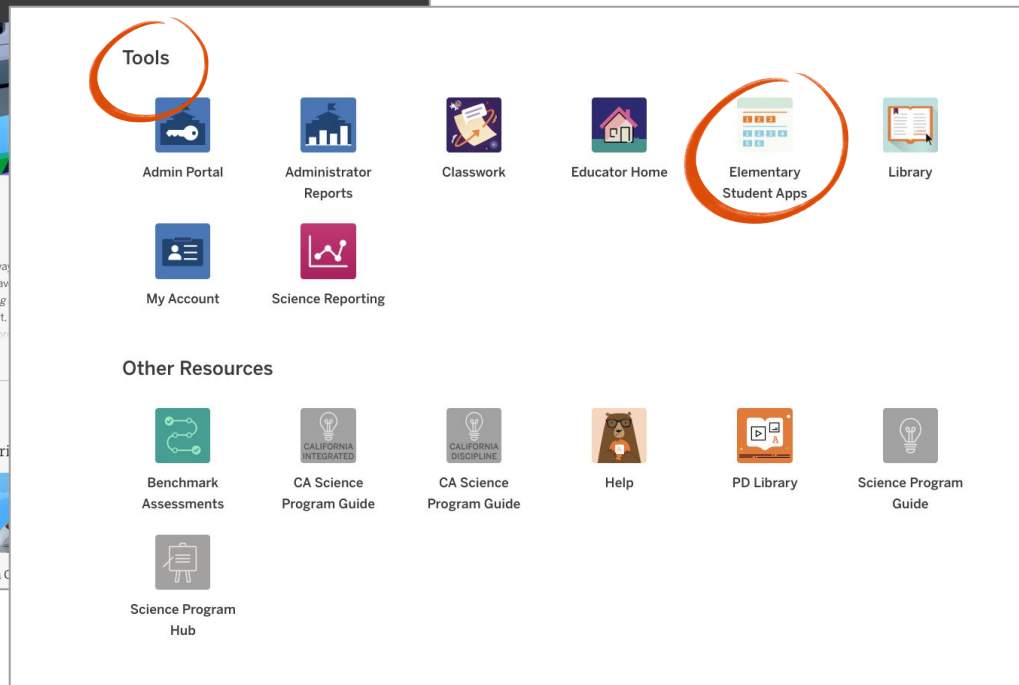
Additional Resources



Navigating to the Student Apps page

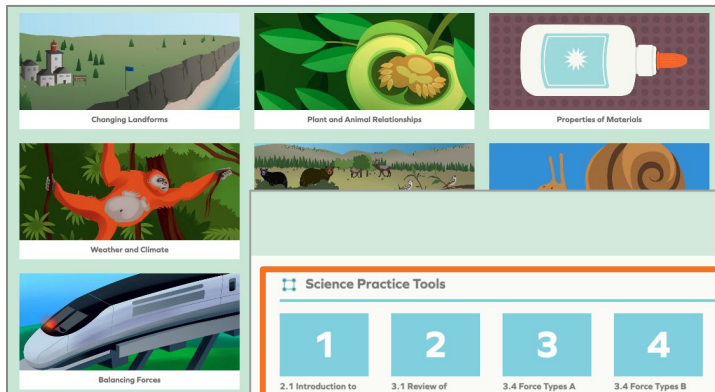


The screenshot shows the Amplify website interface. The top navigation bar includes the Amplify logo, a home icon, a grid icon, and links for CURRICULUM, CLASSWORK, and REPORTING. The breadcrumb trail shows "Science California" > "Balancing Forces". The main content area features a large image of a train with the title "Balancing Forces" and a "Printable Teacher Guide" button. On the left sidebar, there are links for Unit Overview, Chapters, Printable Resources, Planning for the Unit, Teacher References, and Offline Preparation. The main content area also includes a "Unit Overview" section with a "What's in This Unit?" subsection and a "Chapters" section with "Chapter 1: Why does the train r".



The screenshot shows the Amplify website interface. The top navigation bar includes the Amplify logo, a home icon, a grid icon, and links for CURRICULUM, CLASSWORK, and REPORTING. The breadcrumb trail shows "Science California" > "Balancing Forces". The main content area features a large image of a train with the title "Balancing Forces" and a "Printable Teacher Guide" button. On the left sidebar, there are links for Unit Overview, Chapters, Printable Resources, Planning for the Unit, Teacher References, and Offline Preparation. The main content area also includes a "Unit Overview" section with a "What's in This Unit?" subsection and a "Chapters" section with "Chapter 1: Why does the train r".

Student Apps page



Balancing Forces

Science Practice Tools

| | | | | | | | | | |
|------------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------------|---------------------------|-------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2.1 Introduction to Diagrams | 3.1 Review of Diagrams | 3.4 Force Types A | 3.4 Force Types B | 3.4 Force Types C | 3.4 Force Types D | 3.4 Force Types E | 3.4 Force Types F (extra) | 3.4 Force Types G (extra) | 4.4 Floating Paper Clip |

| | | |
|----------------------|----------------------|-----------------------------|
| 11 | 12 | 13 |
| 5.4 Floating Train A | 5.4 Floating Train B | 5.4 Floating Magnet (extra) |

Student Books

| | | | | |
|---------------------|-------------------|--------------------|------------|--|
| 1 | 2 | 3 | 4 | 5 |
| Explaining a Bridge | Forces All Around | Handbook of Forces | Hoverboard | What My Sister Taught Me About Magnets |

Libros para estudiantes

| | | | | |
|----------------------|------------------------|-------------------|----------------|--|
| 1 | 2 | 3 | 4 | 5 |
| Explicando un puente | Fuerzas que nos rodean | Manual de fuerzas | Tabla voladora | Lo que me enseñó mi hermano sobre los imanes |



Apps in this unit

Amplify CURRICULUM CLASSWORK REPORTING

Science California > **Balancing Forces**

22 Lessons

Printable Teacher Guide

Unit Overview


What's in This Unit?

Scientists and engineers have figured out a way to build a train that actually floats on air as it goes cruising down the track at high speeds. Using similar principles, engineers have created a hoverboard—a device-like a skateboard that floats above a track rather than rolling along the ground. In the *Balancing Forces* unit, students work to investigate and then explain how these inventions seem to defy logic. Over the course of the unit, through firsthand experiences, discourse, and reading and writing informational text, students will come to understand how forces can cause stability or change in an object's motion. They will discover how


[Read more >](#)

Chapters


Chapter 1: Why does the train rise?




LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Making an Object Move



LESSON 1.3
Forces All Around



LESSON 1.4
Explaining Forces and the Train

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

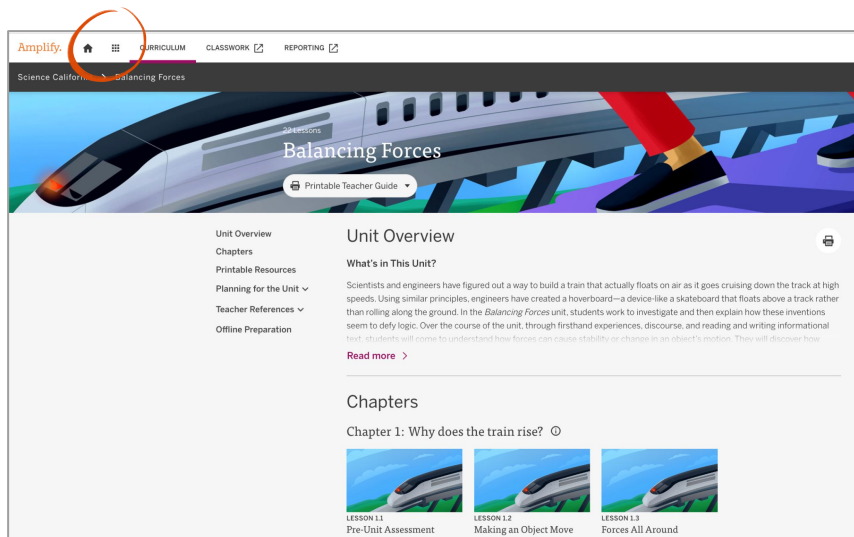
Teacher References

- 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

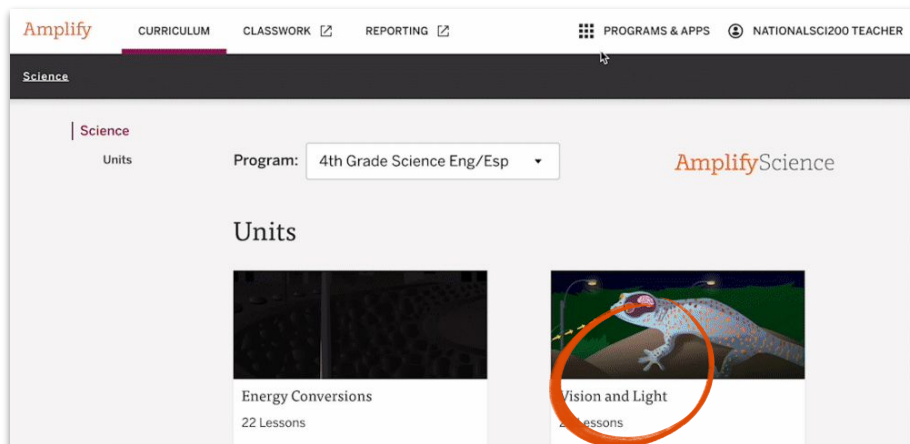
English Español

Program Hub

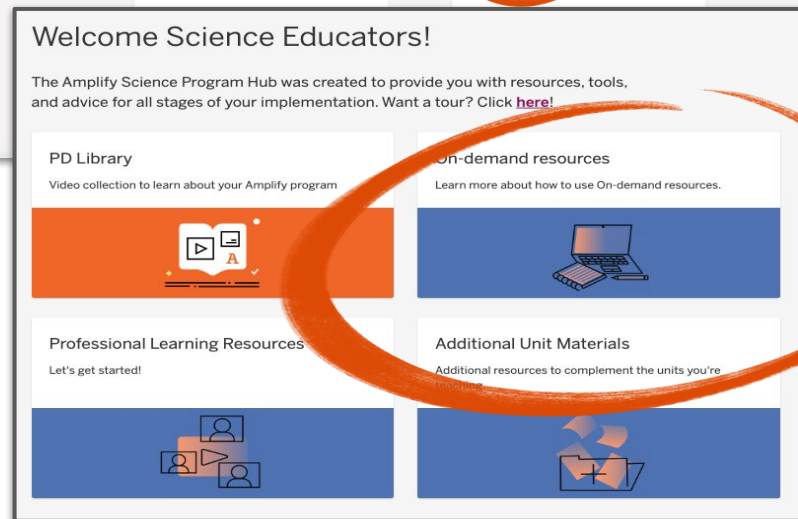
Use the Amplify Science Program Hub to find useful resources for implementing Amplify Science, including unit overview videos and planning tools.



The screenshot shows the Amplify Science Program Hub for the 'Balancing Forces' unit. The top navigation bar includes 'Amplify', 'CURRICULUM', 'CLASSWORK', and 'REPORTING'. The main header features a large image of a train with the title 'Balancing Forces' and a 'Printable Teacher Guide' button. The left sidebar lists 'Unit Overview', 'Chapters', 'Printable Resources', 'Planning for the Unit', 'Teacher References', and 'Offline Preparation'. The main content area is titled 'Unit Overview' and includes a 'What's in This Unit?' section with a description of the unit's focus on forces and motion. Below this, there is a 'Chapters' section with 'Chapter 1: Why does the train rise?'. At the bottom, there are three lesson cards: 'LESSON 1.1 Pre-Unit Assessment', 'LESSON 1.2 Making an Object Move', and 'LESSON 1.3 Forces All Around'.



The screenshot shows the Amplify Science Program Hub for the '4th Grade Science Eng/Esp' program. The top navigation bar includes 'Amplify', 'CURRICULUM', 'CLASSWORK', 'REPORTING', 'PROGRAMS & APPS', and 'NATIONALSCI200 TEACHER'. The main header features a large image of a train with the title '4th Grade Science Eng/Esp' and a 'Printable Teacher Guide' button. The left sidebar lists 'Unit Overview', 'Chapters', 'Printable Resources', 'Planning for the Unit', 'Teacher References', and 'Offline Preparation'. The main content area is titled 'Units' and includes a 'What's in This Unit?' section with a description of the unit's focus on forces and motion. Below this, there is a 'Chapters' section with 'Chapter 1: Why does the train rise?'. At the bottom, there are three lesson cards: 'LESSON 1.1 Pre-Unit Assessment', 'LESSON 1.2 Making an Object Move', and 'LESSON 1.3 Forces All Around'.



The screenshot shows the Amplify Science Program Hub for the 'Welcome Science Educators!' page. The top navigation bar includes 'Amplify', 'CURRICULUM', 'CLASSWORK', 'REPORTING', 'PROGRAMS & APPS', and 'NATIONALSCI200 TEACHER'. The main header features a large image of a train with the title 'Welcome Science Educators!' and a 'Printable Teacher Guide' button. The left sidebar lists 'Unit Overview', 'Chapters', 'Printable Resources', 'Planning for the Unit', 'Teacher References', and 'Offline Preparation'. The main content area is titled 'Welcome Science Educators!' and includes a 'What's in This Unit?' section with a description of the unit's focus on forces and motion. Below this, there is a 'Chapters' section with 'Chapter 1: Why does the train rise?'. At the bottom, there are three lesson cards: 'LESSON 1.1 Pre-Unit Assessment', 'LESSON 1.2 Making an Object Move', and 'LESSON 1.3 Forces All Around'.

Program Hub

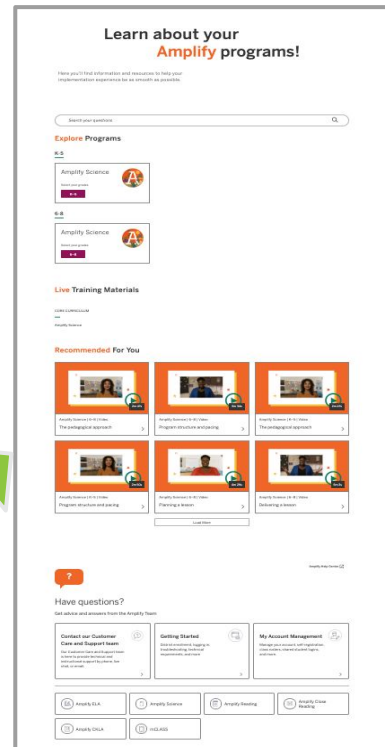
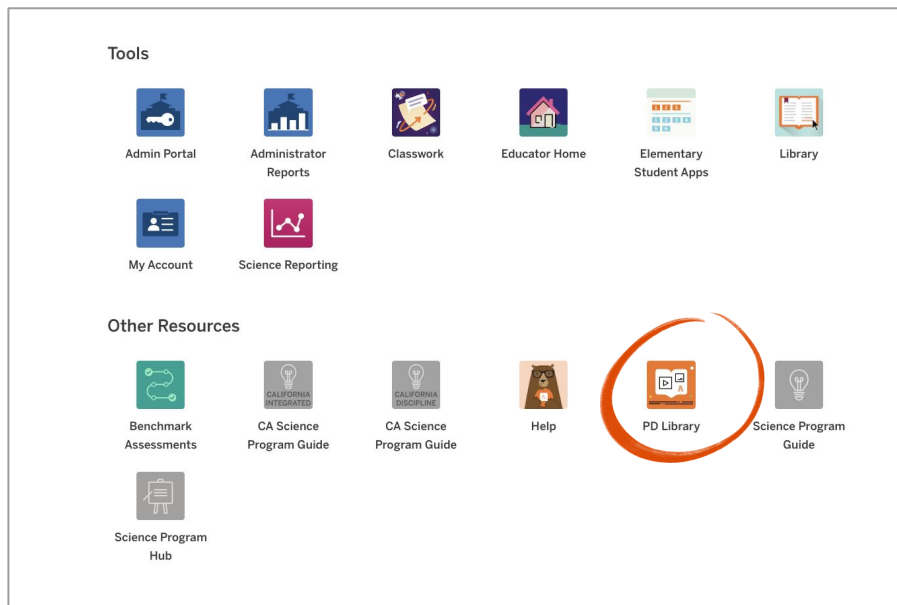
Use the Amplify Science Program Hub to find useful resources for implementing Amplify Science, including unit overview videos and planning tools.

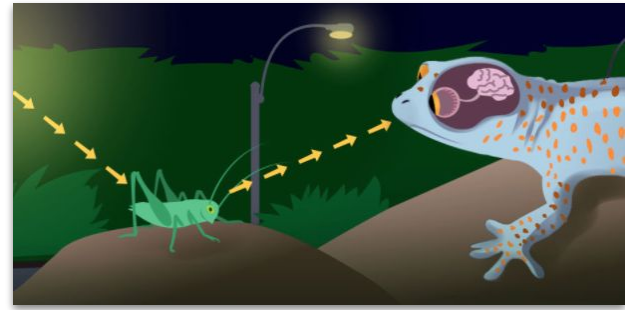
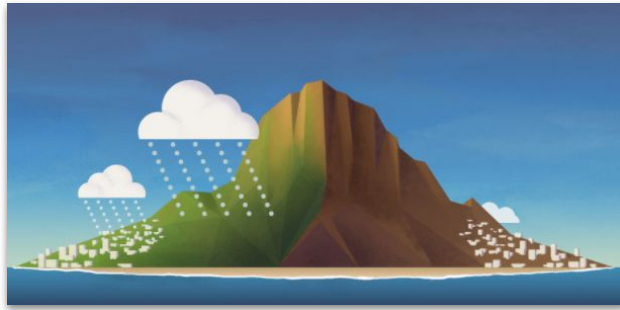
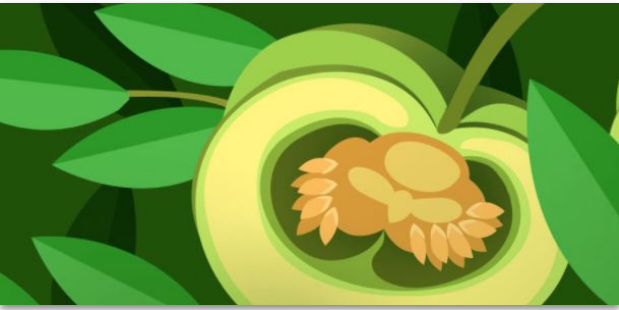
The screenshot shows the Amplify Science Program Hub for the "Balancing Forces" unit. The top navigation bar includes "Amplify", "CURRICULUM", "CLASSWORK", and "REPORTING". The main header features a large image of a train with the title "Balancing Forces" and a "Printable Teacher Guide" button. On the left, a sidebar lists "Unit Overview", "Chapters", "Printable Resources", "Planning for the Unit", "Teacher References", and "Offline Preparation". The main content area is titled "Unit Overview" and includes a "What's in This Unit?" section with a paragraph about the unit's focus on forces and motion. Below this, the "Chapters" section lists "Chapter 1: Why does the train rise?" and three lesson cards: "LESSON 1.1 Pre-Unit Assessment", "LESSON 1.2 Making an Object Move", and "LESSON 1.3 Forces All Around".

The screenshot shows the Amplify Science Program Hub for the "4th Grade Science Eng/Esp" program. The top navigation bar includes "Amplify", "CURRICULUM", "CLASSWORK", "REPORTING", "PROGRAMS & APPS", and "NATIONALSCI200 TEACHER". The main header features a large image of a gecko with the title "4th Grade Science Eng/Esp" and a "Printable Teacher Guide" button. On the left, a sidebar lists "Unit Overview", "Chapters", "Printable Resources", "Planning for the Unit", "Teacher References", and "Offline Preparation". The main content area is titled "Units" and includes a "What's in This Unit?" section with a paragraph about the unit's focus on forces and motion. Below this, the "Chapters" section lists "Chapter 1: Why does the train rise?" and three lesson cards: "LESSON 1.1 Pre-Unit Assessment", "LESSON 1.2 Making an Object Move", and "LESSON 1.3 Forces All Around".

Additional program resources

Another way to access the PD Library





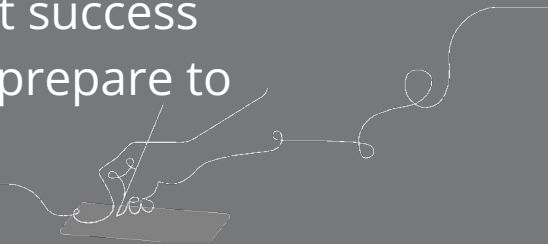
Plan for the day

- Independent Planning
 - Preparation
 - Pacing
 - Planning
- Closing

Goals for the day:

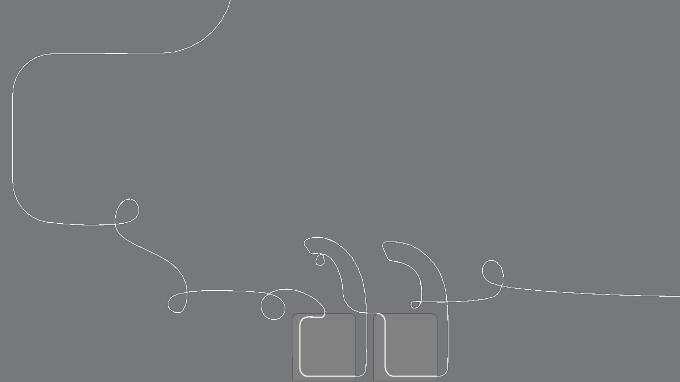
By the end of the day, you will:

- ✓ Experience how all the instructional components fit together in the context of the unit
- ✓ Gain a deeper understanding of the purposeful sequencing of each activity and lesson within a chapter
- ✓ Become more familiar with multimodal instruction and how it provides multiple at bats to support student success
- ✓ Use the Amplify curriculum and resources to prepare to teach



Teaching science

“Science [is] both a body of knowledge and an evidence-based, model and theory building enterprise that continually extends, refines, and revises knowledge.”

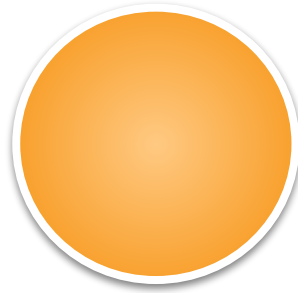


Closing reflection

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

Please provide feedback!

Type:

Strengthen

Session title:

Unit one deep dive

Professional Learning Specialist name:

Insert name

(insert email, if you would like)