Studies Weekly

EXPLORE SCIENCE

Program Preview

Dive in!

TEACHERS LOVE STUDIES WEEKLY

"I loved how hands-on it is and allows for teacher flexibility. My students enjoy having the tangible paper but also enjoy how interactive it is online. It's easy to cut apart the weekly issue and do more project-based activities with it. Which is why I recommended it to my current school, and the committee voted to adopt this program."

Early Childhood & Lower School Counselor

"Studies Weekly's science curriculum is everything I always looked for as a teacher. It's engaging for the students, easy to implement, and three-dimensional."

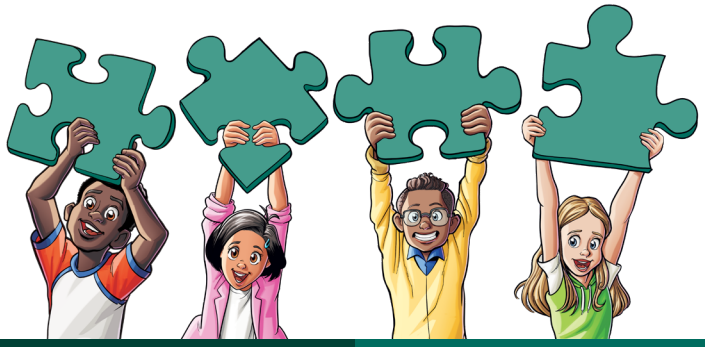
Curriculum Writer

"This is my 24th year teaching, and this is the best science program I've ever used before. You can do so many hands-on things with it. The terminology is awesome for kids. It's easy for teachers."

1st Grade Teacher

CONTENTS

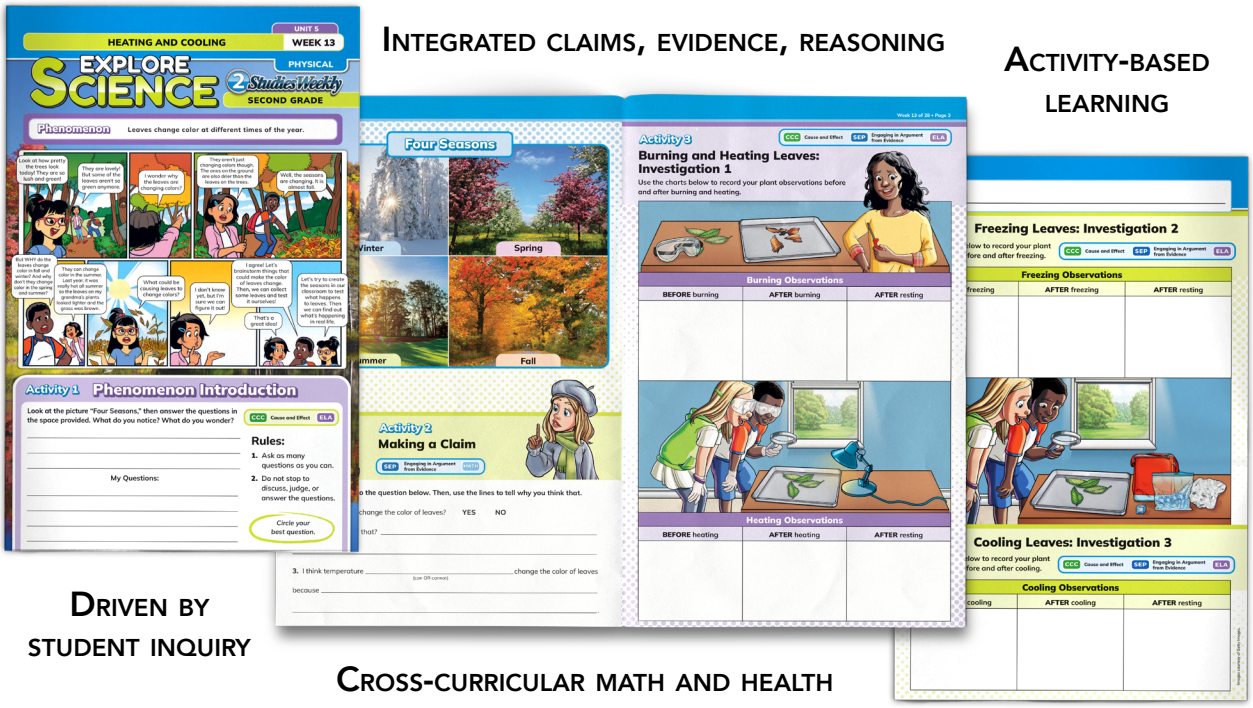
COMPREHENSIVE CORE CURRICULUM



	COMPREHENSIVE	SUPPLEMENTAL
The backbone of classroom instruction	✓	
Heavily based on educational research	✓	
Addresses most or all state standards and frameworks	✓	
Used for Tier 1 instruction	✓	
Includes formative and summative assessments	✓	
Complements student materials with rich teacher materials	✓	
May include extra topics and depth	✓	✓
Can be used for Tier 2 or 3 instruction	✓	✓
May include remediation, enrichment, and extension activities	✓	✓
Teachers can differentiate class materials to meet diverse student needs	✓	✓
Studies Weekly!	✓	✓

NEW K–5 SCIENCE

Fully aligned to the **NEXT GENERATION SCIENCE STANDARDS (NGSS),** Studies Weekly's Explore Science curriculum builds scientific literacy and competency through three dimensions: Scientific and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas.



INTEGRATED CLAIMS, EVIDENCE, REASONING

ACTIVITY-BASED LEARNING

DRIVEN BY STUDENT INQUIRY

CROSS-CURRICULAR MATH AND HEALTH SKILLS EMBEDDED THROUGHOUT

SEE MORE OF YOUR HANDS-ON SCIENCE

s-w.co/sci-sample

WHAT COMES WITH STUDIES WEEKLY

Teacher Edition

Spend less time planning and more time teaching.

- Ready-made lessons
- Essential questions
- Activities & assessments
- Standards correlations
- Material lists

Online Platform

Engage all students and expand their learning!

- Exclusive video library
- Audio reader
- Rewards system
- Customizable content
- Teacher resources

Printables

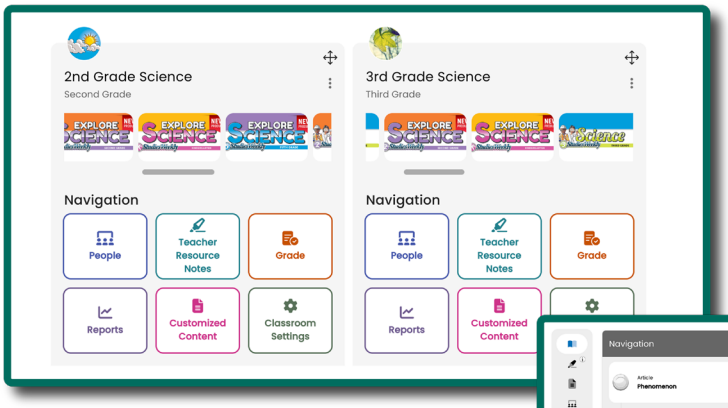
Each unit includes multiple lesson supports, graphic organizers, activity sheets, flash cards, and word wall cards to **REINFORCE** and **EXTEND** student learning.

Student Artifacts

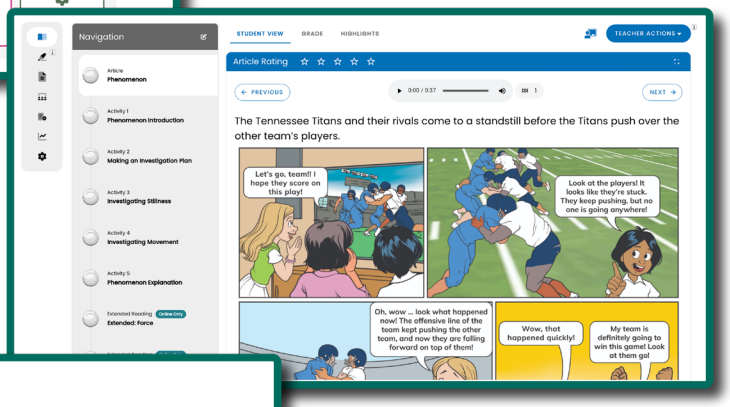
CUT IT. CONSUME IT.
Students can make the print publications their own by highlighting and annotating on it. Use Student Editions to create student artifacts and assess knowledge.

STUDIES WEEKLY ONLINE

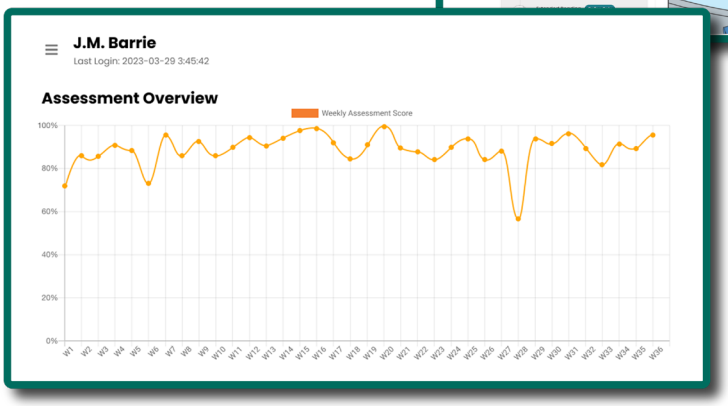
Our user-friendly digital learning program is used by over **1.7 MILLION TEACHERS** and **STUDENTS**. It is similar to popular LMS platforms and appeals to all learning styles with easy-to-use lesson plans, videos, and activities.



PLAN YOUR LESSONS, ASSIGNMENTS, AND ASSESSMENTS ALL IN ONE PLACE



BUILT-IN AUDIO READER
TEXT ANNOTATION TOOLS
AUTO-GRADED ASSESSMENTS
GOOGLE CLASSROOM INTEGRATION



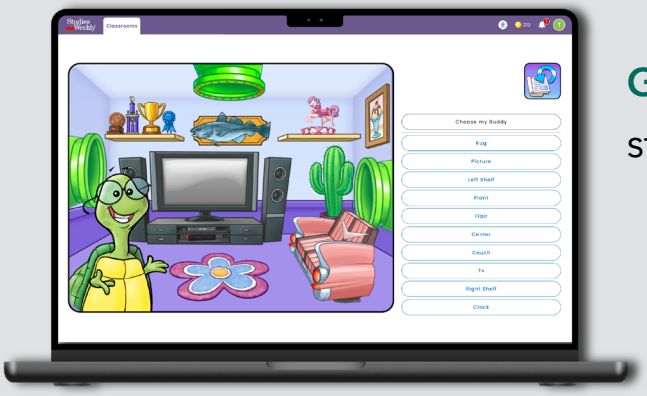
MONITOR INDIVIDUAL STUDENT OR CLASS PROGRESS WITH JUST A FEW CLICKS

s-w.co/online

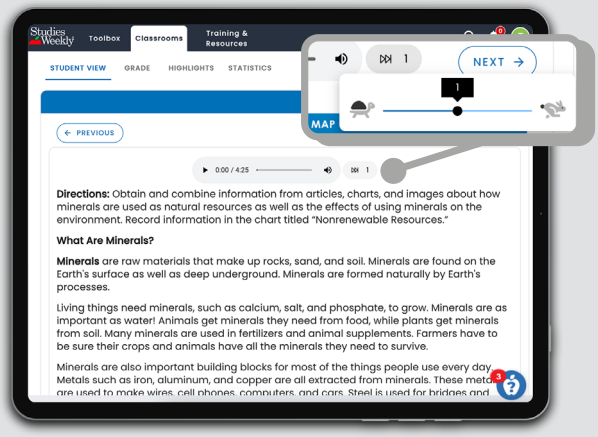
START A 60-DAY FREE TRIAL!

GAMIFICATION AND TOOLS

Your science program includes many additional resources within the digital platform to enhance and expand your teaching.



GAMIFICATION encourages student engagement

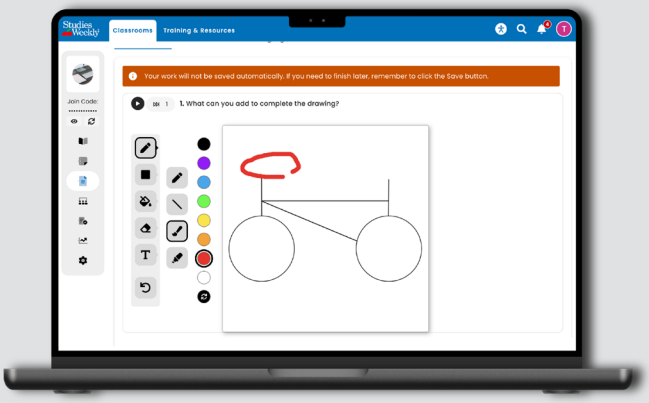


ARTICLE TOOLS include:

- Variable speed audio reader
- Highlighting & annotating tools

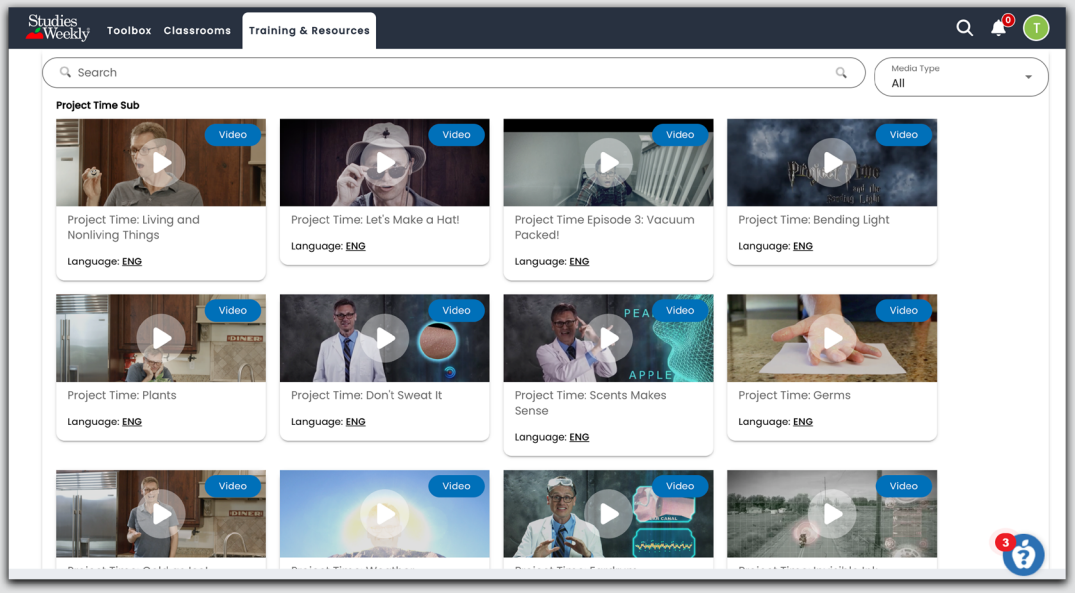
PHENOMENON COMICS introduce concepts through engaging stories

INTERACTIVE QUESTIONS that allow students to draw, sort, group, label, and more

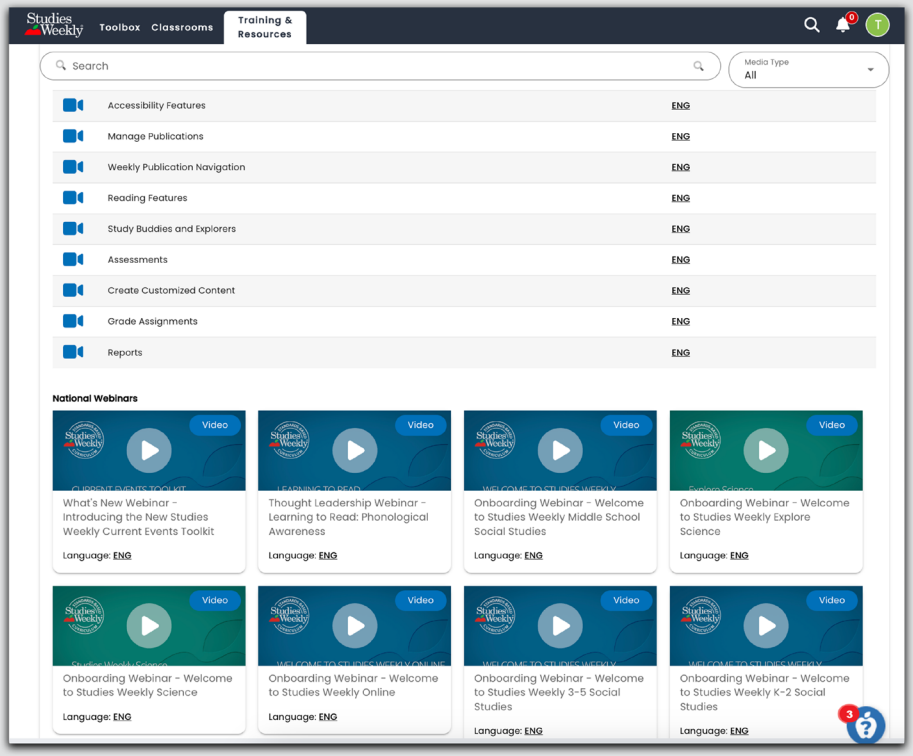


TEACHER RESOURCES

Empower teachers with comprehensive teacher resources to lessen preparation time, deepen learning, and enhance the teacher experience.



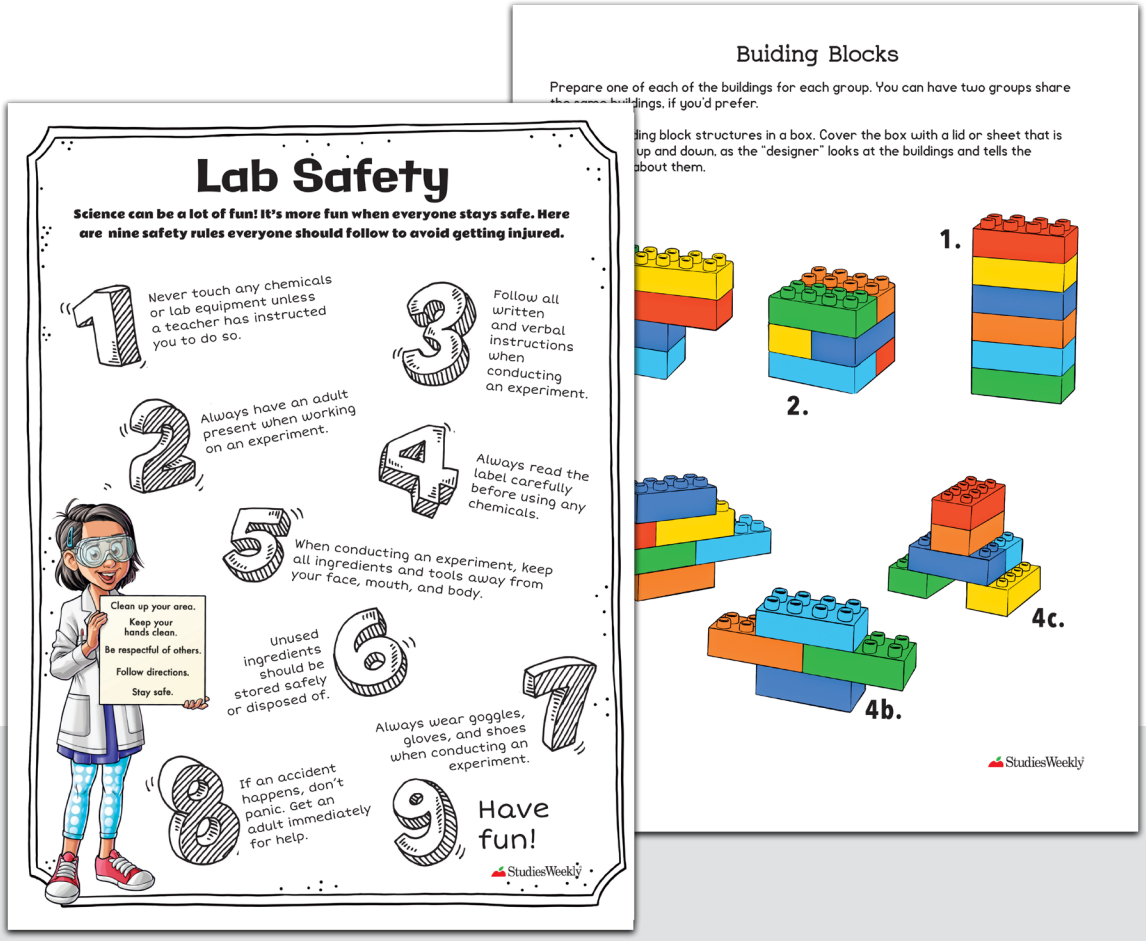
Engaging
SCIENCE VIDEOS



TRAINING and
ON-DEMAND PD

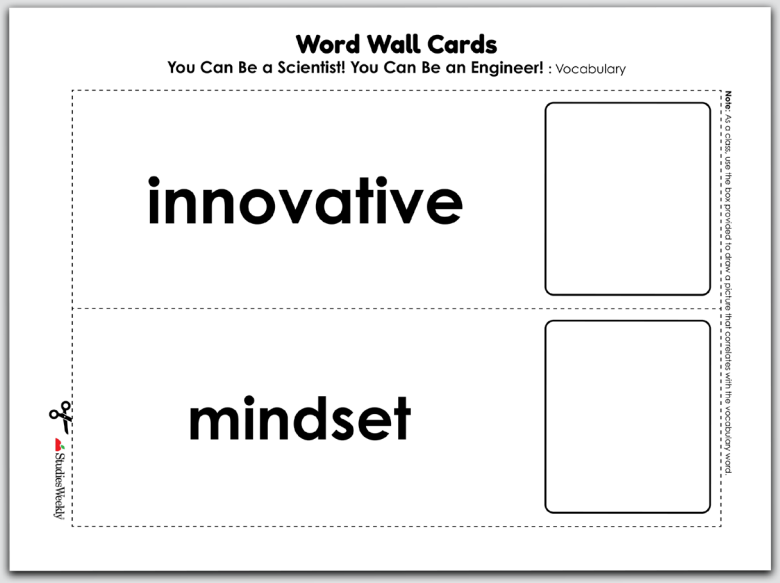
PRINTABLES

Printables help students connect with the material, extend learning, and reinforce key concepts.



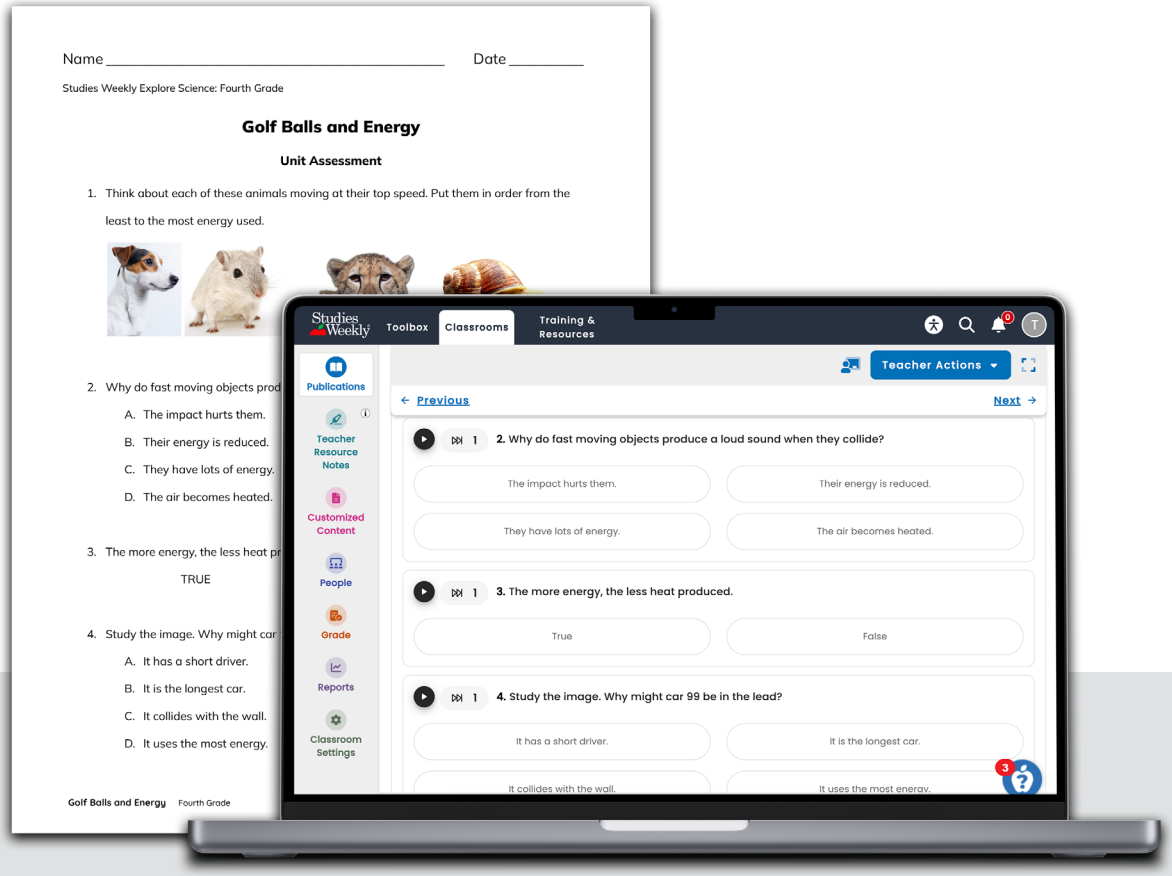
Word wall

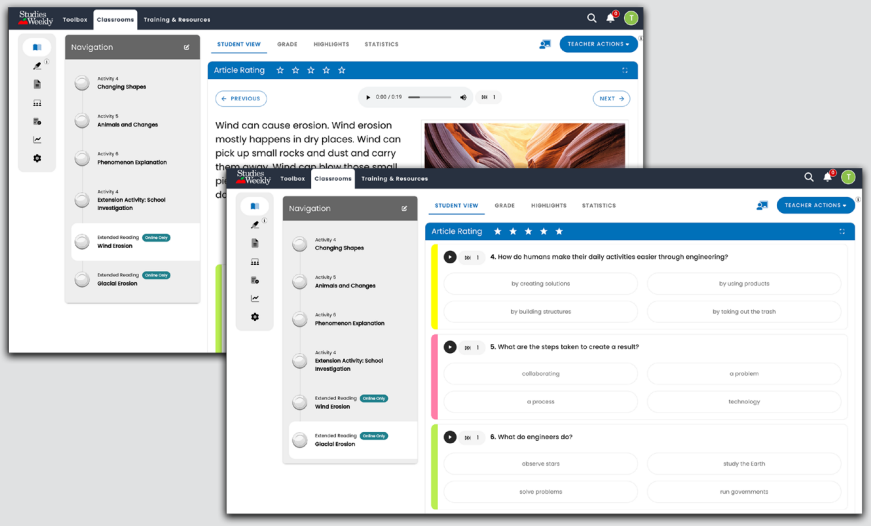
VOCABULARY cards



ASSESSMENTS

Monitor student progress with formative and summative assessments that are easy to edit, assign, and grade in print or online.

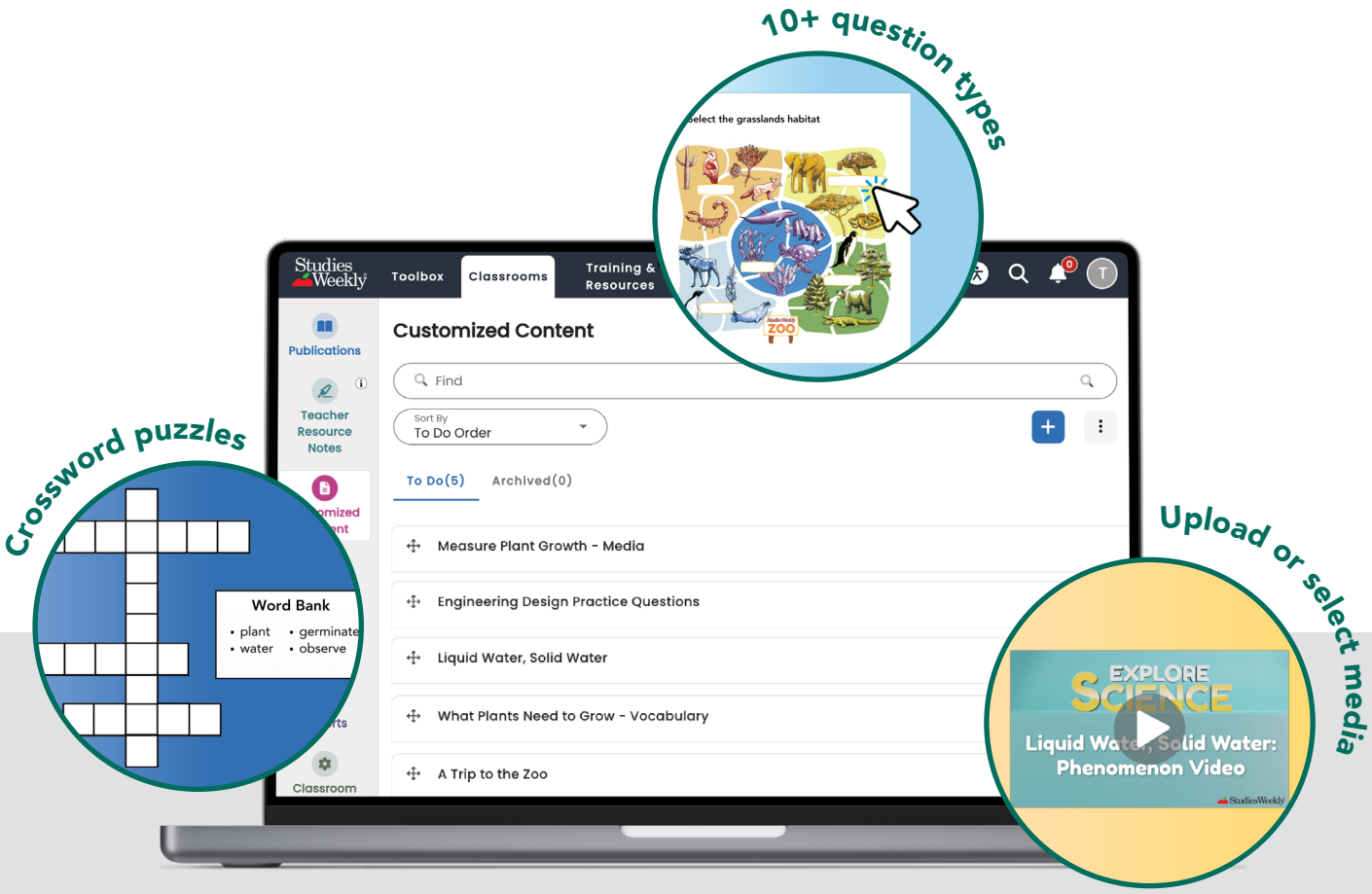




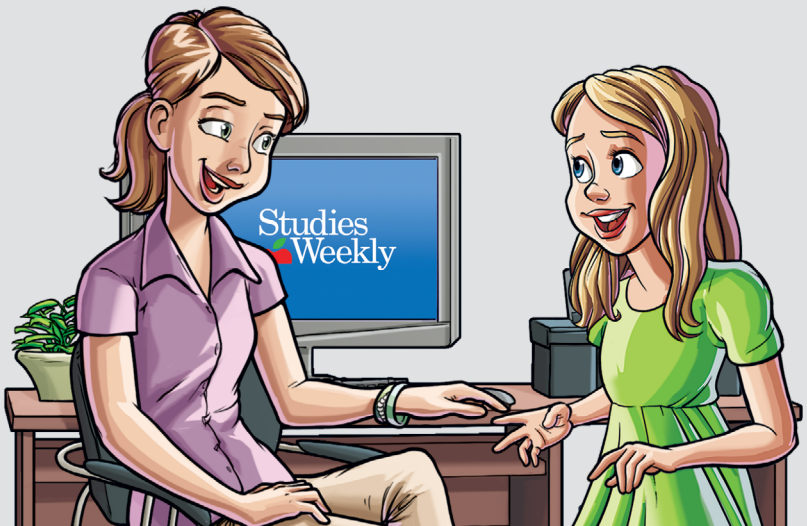
Check knowledge with comprehension questions after each article and lesson activity

CUSTOMIZABLE CONTENT

Create a **DYNAMIC ONLINE LEARNING EXPERIENCE** that works for you and your students. Customize assignments, assessments, media, and more in your publications. Or, create and upload your own content to fit your students' needs.



Assign content to the whole class or individual students for increased **DIFFERENTIATION**



Science Kits

Optional science kits available to enhance
EXPERIENTIAL LEARNING through hands-on instruction.

Science Kit Grade 4 example

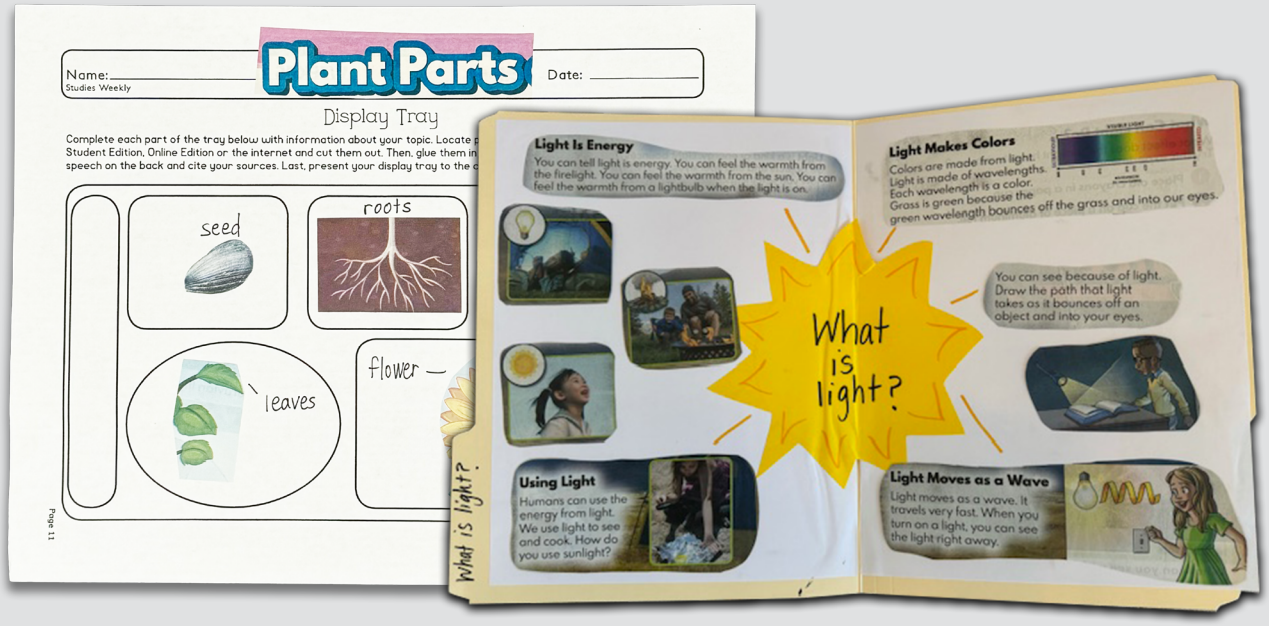
Your Science Kit includes:

- Essential materials needed in the hands-on curriculum activities
- Important science tools such as thermometers, scales, beakers, and more
- Consumable materials not typically found in the classroom
- Enough items to support a typical classroom of students working in groups
- Unit-specific packaging within the storage bins

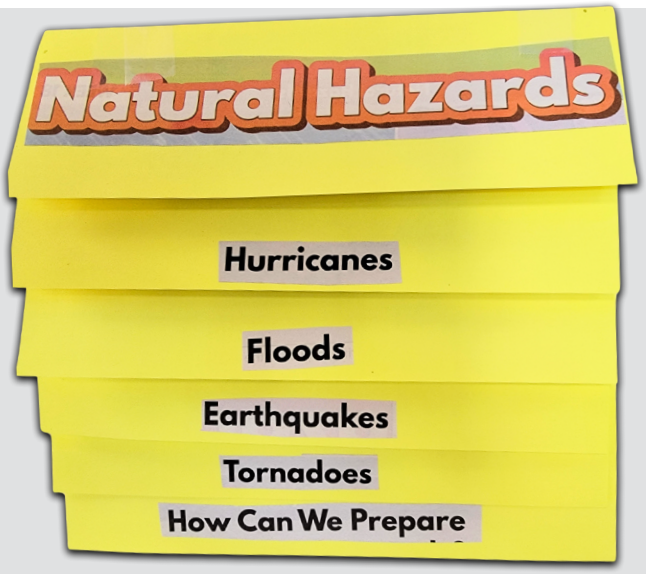
You can replace kit items yearly by ordering refill kits

STUDENT ARTIFACTS

Because Studies Weekly is a consumable program, students can cut out images and information from the print publication to create learning artifacts.




Week 25 of 28 • Page 4
Name
Activity 4 Landforms
SEP Developing and Using Models
CCC Patterns
ELA
Plains
Hills
Canyon
Landforms
Plateau
Desert
Beach
Mountains


Natural Hazards
Hurricanes
Floods
Earthquakes
Tornadoes
How Can We Prepare


Cause → Effect match
Cause and Effect
Understanding Cause and Effect
Cause and effect can help you understand why things happen. Scientists use cause and
their designs.
SE → EFFECT
Winter
Spring
Seasons
Summer
Fall

UNIQUE BENEFITS OF PRINT

While it may take a little time initially to separate the publications, having the ability to file each week separately can actually save time in the long run. Whereas workbook-style curricula offer the risk that students will lose their curriculum, the newspaper format also allows you to give students just one week or unit at a time.

"The most appealing feature is that students have the newspaper format, which they prefer over a textbook. They can interact with it online or on paper. The online features allow students to highlight, underline, and circle which reinforces the information taught in class."

Curriculum Supervisor

"The students absolutely love the newspapers. It takes complicated material and puts it in a way that they can understand and enjoy. They then like to take them home and share them with their family!"

1st Grade Teacher

SORTING STUDENT EDITIONS

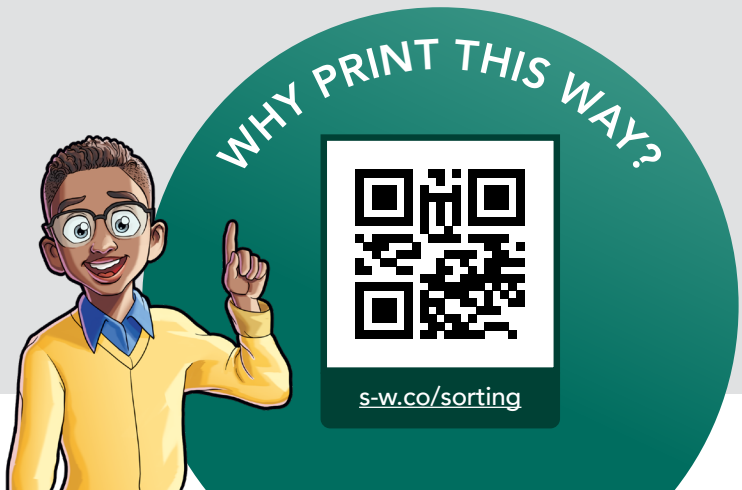
Because the Studies Weekly Student Editions are printed in complete student sets, they come nested together into a student edition with all the weeks together. As you separate publications, you can sort them by themes or units and hand them out individually during instruction, giving you more control over how much curriculum your students receive at one time.

IDEAS FOR SORTING

1. 1. Put your students in a circle
   2. Assign them each a week to find in the SE
   3. One student starts by pulling out Week 1, then passes the rest to the student in charge of Week 2, etc.
   4. Gather papers by weeks, clip together

2. Give older students a service opportunity and ask them to sort

3. Ask a parent helper to sort



EDUCATOR SUPPORT

At Studies Weekly, we believe every educator deserves equitable access to effective, ongoing training and support. Our programs offer student and teacher-friendly resources, Professional Development opportunities, and a partnership with dedicated teams ready to assist you every step of the way.

Our Professional Development and Customer Support teams partner with you to help you reach your professional, classroom, and implementation goals.

Support options include:

- Step-by-step Onboarding Guide available to all educators
- Training resources and videos available in Studies Weekly Online
- Professional Development that can be built around your school or district needs
- One-on-one help from a Teacher Advocate
- Free weekly Teacher Talk Q&A sessions
- A comprehensive Help Center filled with useful articles, videos, and step-by-step guides
- A friendly Customer Support team that can troubleshoot issues with orders, shipping, technical difficulties, rostering, etc.

CUSTOMIZED PD

All sessions can be tailored to fit your needs by:

- Content area
- Grade level
- Instructional focus
- Learning outcomes
- Mode of delivery
- Audience

Onboarding

Receive introductory training in your print publications and online platform

Instructional Modeling

Demonstrate effective teaching strategies in real classroom settings

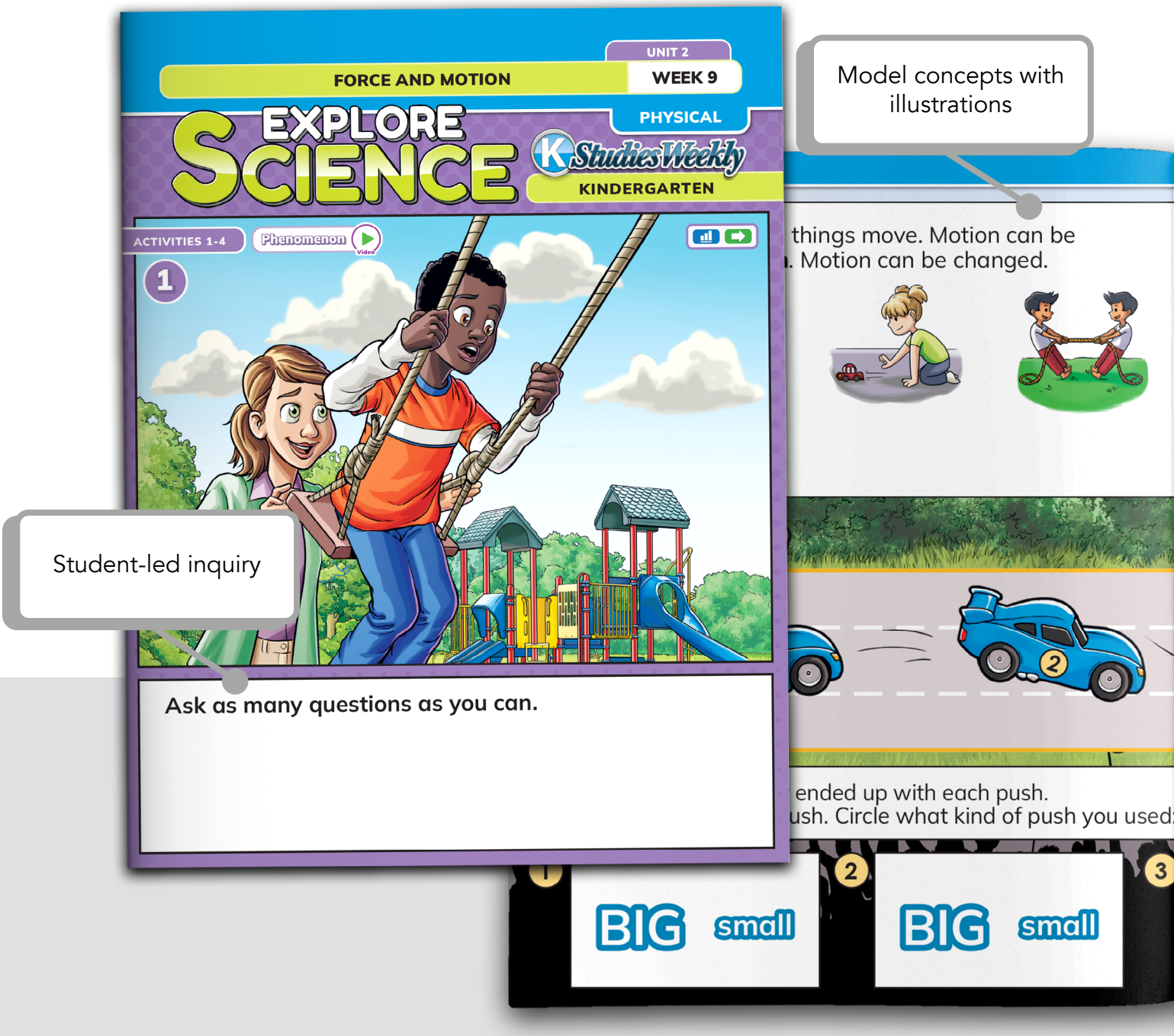
Train the Trainer

Coach leaders in Studies Weekly professional development

Curriculum Coaching

Support for aligning Studies Weekly publications with local curriculum

**Studies Weekly awards PD credits for every completed PD session.*



KINDERGARTEN
STUDENT EDITION

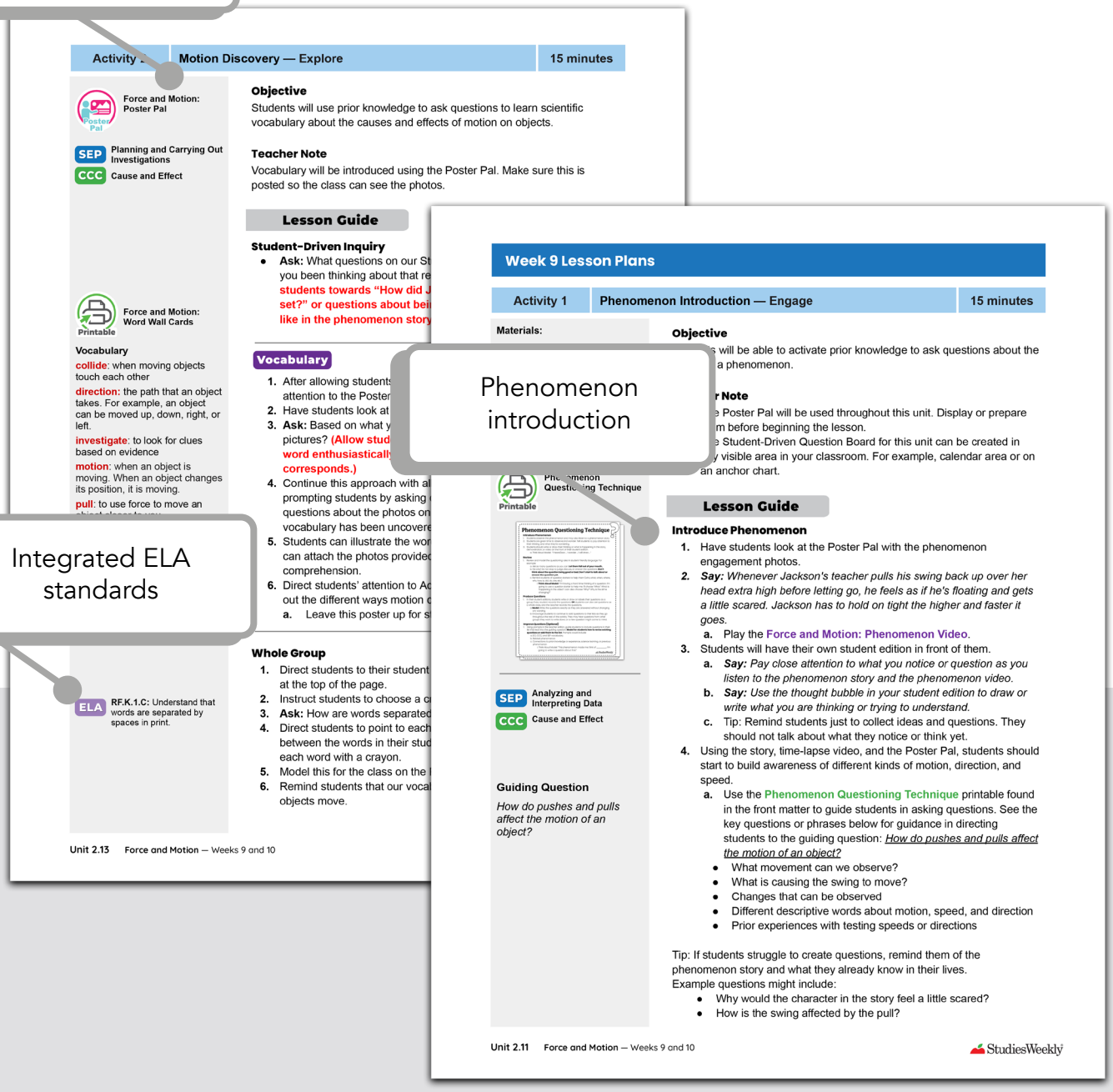
GRADE K


Circle the things that show **pull**. Put an X on the things that show **push**.
How many did you X?
1 2 3
How many did you circle?
1 2 3
GO
BIG small
A bigger push causes a
effect.
Collect, record, and analyze evidence
CHALLENGE
ffort you used for each pull.
. Record the time. Collect Evidence:
2nd Pull
3rd Pull
TIME
TIME
e supports our claim.
Learn cause and effect

Reference lesson materials

Integrated ELA standards

Phenomenon introduction



KINDERGARTEN

TEACHER EDITION

Suggestions for differentiation

Suggested lesson guide

Activity 3 | **Car Race — Explore** | **15 minutes**

Materials:
- masking tape
- toy cars (one per pair)

Printable **Race Cars**

SEP **Planning and Conducting an Investigation**

CCC **Cause and Effect**

MATH **K.MD.A.2:** Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.

Objective

Students will be able to collect evidence to determine the effect of different pushes on an object's distance and speed. Data will be collected as evidence to support their understanding.

Teacher Note

To prepare for this activ
1. Clear several spa
three feet wide.
2. Using masking ta
3. To measure the d
race car pictures
starting line.
   a. Suggestion: Tape
starting line, the second two paces, and the third three paces from the starting line.

Lesson Guide

Student-Driven Inquiry

1. **Ask:** Based on what you know, can you share with a partner and use a vocabulary word to describe one way an object can move? **(Students should share one or more vocabulary words with their partner.)**
2. Pick up a toy car.
   a. **Ask:** How do you think you could make the car travel the furthest distance? **(to push it really hard)**
3. **Ask:** Does pushing something hard make you think of something we've seen this week? **(the phenomenon)**
4. **Ask:** Are there any questions on our Student-Driven Question Board related to our guiding question: *How do pushes and pulls affect the motion of an object?*
   - Guide students towards questions relating to pushes, speed, or strength of pushes.

Collaborative Learning

1. Direct students' attention to one of the racetracks taped on the floor.
2. Tell students that they will have three tries. Their goal is to push their car hard enough to reach each target.
3. Point out the numbered race cars on the track and describe how they will be used to measure how far their car can travel.
   a. Discuss procedural rules:
      - The car must stay on the ground at all times.
      - Take turns.
      - Follow the science rules for precise testing.
4. Choose two students to model a small push and big push with the toy cars at the starting line.
5. Direct students to their student editions and explain that they will perform three pushes, trying to reach target 1, target 2, and target 3.

   a. Students will draw in their student edition how close each car got to the target during each push.
   b. They will circle what kind of push they used on each attempt in their student editions.
6. Dismiss teams to several locations around the room and monitor students' learning.

Debrief

1. Gather the class. Direct their attention to the student edition.
2. **Ask:** Who can explain, using evidence, what the results were of our test of different strengths of pushes? **(The bigger push made the cars go f drawings**
3. Read the bigger pus
4. **Ask:** Wha
5. Write the demonstra word with
6. Tell students to turn to a partner and tell them how their evidence supports this. **(The car with the bigger push went farther than the car with the small push, or similar claims.)**

eloping

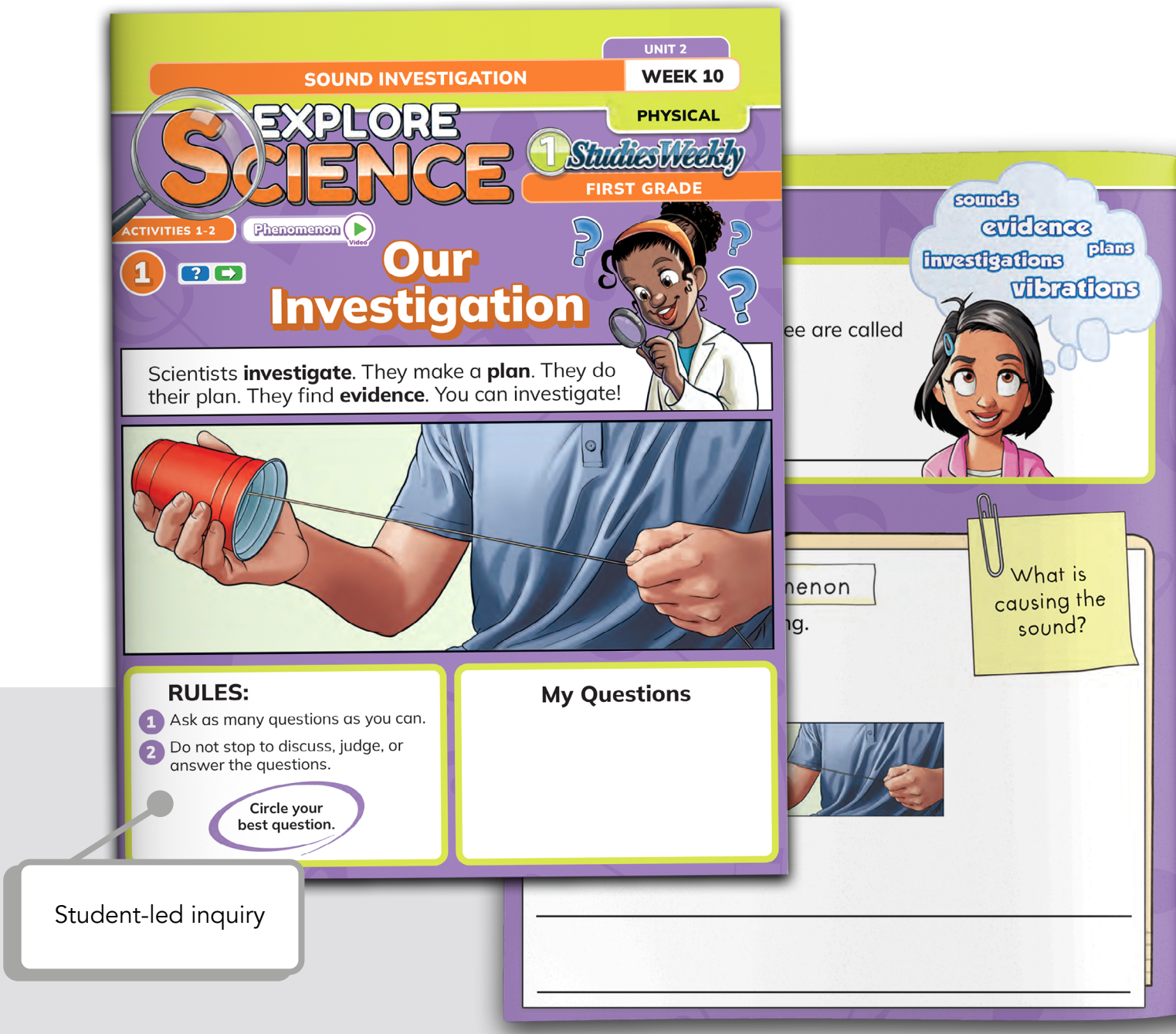
egically partner students who need more support with students who can a leadership role. For those who need extra help with fine motor skills, them to participate by watching.

anced

students to think of three other items that could be used to test the same ntific idea of big pushes and pulls. Challenge them to perform these tests report back the results to you.

idence	Student Edition Response

e whole lesson and answers in the student edition to ensure correct etion and understanding.



GRADE 1
STUDENT EDITION

GRADE 1

STUDENT EDITION

Write directly on the print publication

Investigation Purpose

We want to find out

_____

OUR INVESTIGATION

Write or draw the steps of what you will do in the investigation.

1

2

3

4

5

Learn and plan investigations

e what happened in your investigation.

ct

cup make **sound**?

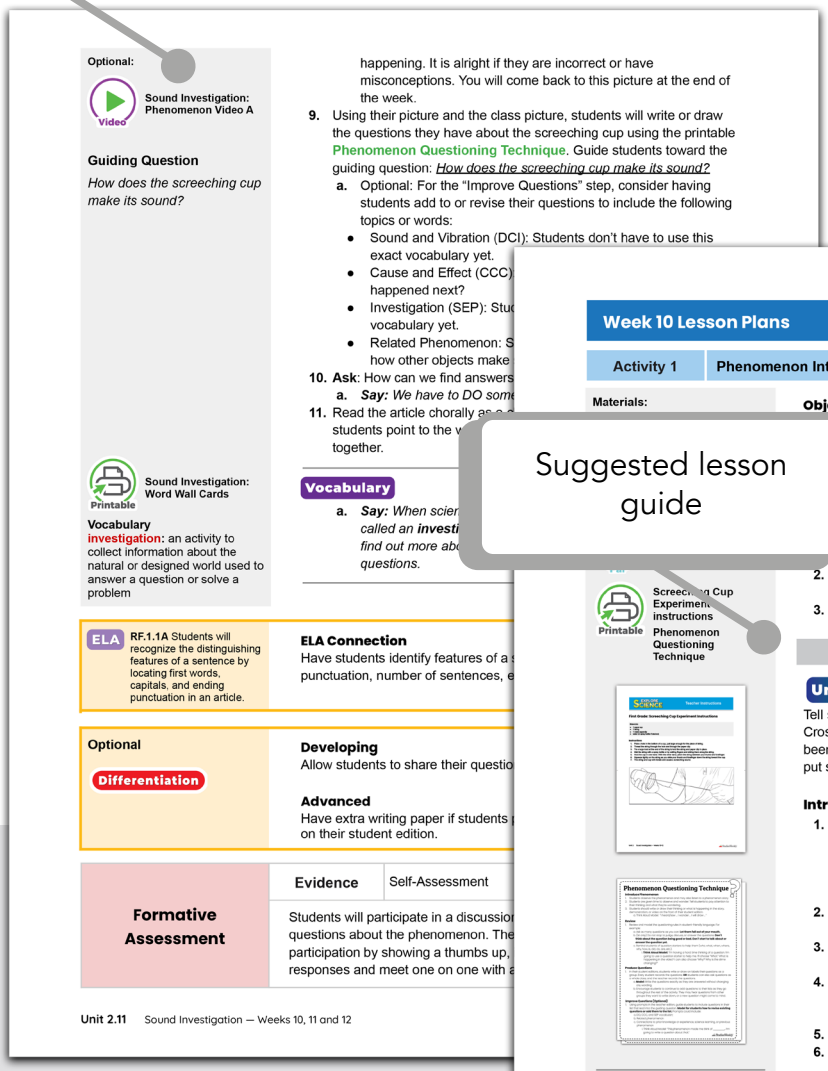
ng evidence from the

icture to help you.

_____ can cause _____.

Learn cause and effect

Reference media in the online platform



Optional:

Sound Investigation: Phenomenon Video A

Guiding Question

How does the screeching cup make its sound?

Sound Investigation: Word Wall Cards

Vocabulary

investigation: an activity to collect information about the natural or designed world used to answer a question or solve a problem

happening. It is alright if they are incorrect or have misconceptions. You will come back to this picture at the end of the week.

9. Using their picture and the class picture, students will write or draw the questions they have about the screeching cup using the printable Phenomenon Questioning Technique. Guide students toward the guiding question: *How does the screeching cup make its sound?*
   a. Optional: For the "Improve Questions" step, consider having students add to or revise their questions to include the following topics or words:
      - Sound and Vibration (DCI): Students don't have to use this exact vocabulary yet.
      - Cause and Effect (CCC)
      - Investigation (SEP): Stu
      - Related Phenomenon: S
10. **Ask**: How can we find answers
    a. ***Say:*** *We have to DO som*
11. Read the article chorally as a
    students point to the w
    together.

Vocabulary

a. ***Say:*** *When scien*
called an ***investi***
find out more abo
questions.

ELA RF.1.1A Students will recognize the distinguishing features of a sentence by locating first words, capitals, and ending punctuation in an article.

ELA Connection
Have students identify features of a
punctuation, number of sentences, e

Optional

Differentiation

Developing
Allow students to share their questio

Advanced
Have extra writing paper if students
on their student edition.

Formative Assessment

Evidence | Self-Assessment

Students will participate in a discussio
questions about the phenomenon. The
participation by showing a thumbs up,
responses and meet one on one with a

Unit 2.11 Sound Investigation — Weeks 10, 11 and 12

Suggested lesson guide

Week 10 Lesson Plans

Activity 1	Phenomenon Introduction: Part One — Engage	20 minutes

Materials:

Screech Cup Experiment instructions
Phenomenon Questioning Technique

SEP Asking Questions

CCC Cause and Effect

Objective

s will be able to ask questions about the cause of the phenomenon.

r Note

ior to the lesson, create the screeching cup using the printable creeching Cup Experiment Instructions. Practice using the reeching cup several times so you can figure out how it works. You ay wish to create a screeching cup for each student or pair of tudents.

2. If, for some reason, your screeching cup isn't working, you can show Sound Investigation: Phenomenon Video A.
3. The Poster Pal will be used in all activities this week.

Lesson Guide

Unit Transition

Tell students that in the last unit, they learned about many different Crosscutting Concepts and Science and Engineering Practices. They have been taught about what scientists do in real life, and in this unit, they get to put some of that knowledge to work as they do their own investigating.

Introduce Phenomenon

1. Activate students' background knowledge:
   a. ***Say:*** *Today, we're going to investigate an object that makes an interesting sound.*
   b. **Ask:** Have you ever experienced something that made an interesting sound? What was it? What was the sound like?
2. Present students with the screeching cup. Tell students that you are going to slide your fingers down the string to make a sound.
3. **Ask**: What do you think it will sound like? Have students share their sound ideas with a peer.
4. Tell students that as you make the sound for them, they should think of what they are wondering about. They should look closely at all the parts of the screeching cup as they listen.
5. Demonstrate the screeching cup several times for students.
6. **Ask:** What was the sound like? Was it what you expected? What would you call the sound?
   a. If students come up with a different idea than "screeching cup" to call this phenomenon, you can use the term that students come up with.
7. Have students draw in their student editions the screeching cup and what happens when you slide your fingers down the string.
8. Tell students that together, you will draw what you observed while listening to the screeching cup and what you think is happening.
   a. On the Poster Pal, add to the picture of the screeching cup with more drawings and labels from what students suggest is

Unit 2.10 Sound Investigation — Weeks 10, 11 and 12 StudiesWeekly

GRADE 1
TEACHER EDITION

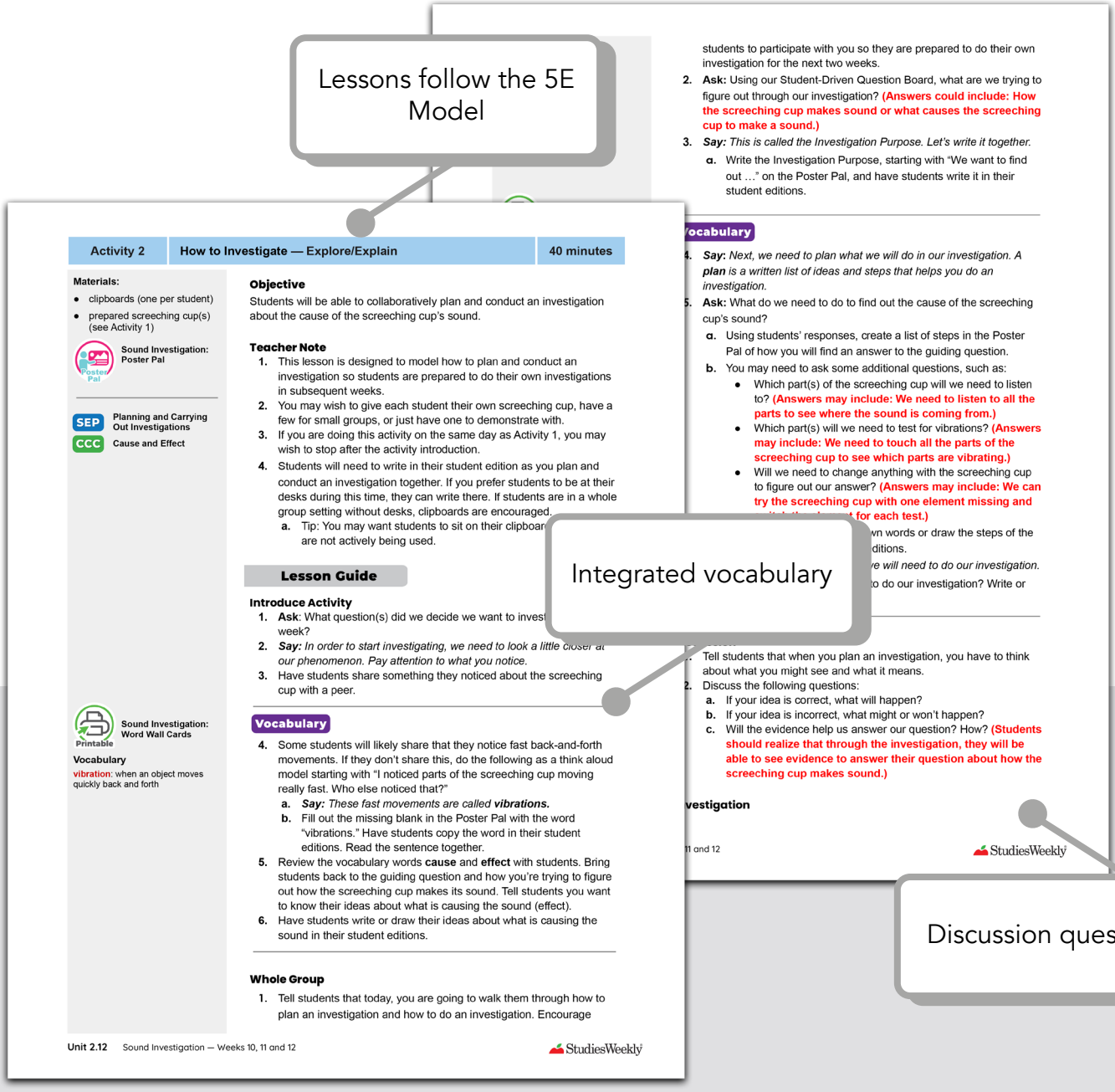
TEACHER EDITION

GRADE 1

Lessons follow the 5E Model

Integrated vocabulary

Discussion questions



Activity 2	How to Investigate — Explore/Explain	40 minutes

Materials:
- clipboards (one per student)
- prepared screeching cup(s) (see Activity 1)

Sound Investigation: Poster Pal

SEP Planning and Carrying Out Investigations

CCC Cause and Effect

Sound Investigation: Word Wall Cards

Vocabulary

vibration: when an object moves quickly back and forth

Objective

Students will be able to collaboratively plan and conduct an investigation about the cause of the screeching cup's sound.

Teacher Note

1. This lesson is designed to model how to plan and conduct an investigation so students are prepared to do their own investigations in subsequent weeks.
2. You may wish to give each student their own screeching cup, have a few for small groups, or just have one to demonstrate with.
3. If you are doing this activity on the same day as Activity 1, you may wish to stop after the activity introduction.
4. Students will need to write in their student edition as you plan and conduct an investigation together. If you prefer students to be at their desks during this time, they can write there. If students are in a whole group setting without desks, clipboards are encouraged.
   a. Tip: You may want students to sit on their clipboar… are not actively being used.

Lesson Guide

Introduce Activity

1. **Ask**: What question(s) did we decide we want to inves… week?
2. ***Say:*** *In order to start investigating, we need to look a little closer at our phenomenon. Pay attention to what you notice.*
3. Have students share something they noticed about the screeching cup with a peer.

Vocabulary

4. Some students will likely share that they notice fast back-and-forth movements. If they don't share this, do the following as a think aloud model starting with "I noticed parts of the screeching cup moving really fast. Who else noticed that?"
   a. ***Say:*** *These fast movements are called* ***vibrations.***
   b. Fill out the missing blank in the Poster Pal with the word "vibrations." Have students copy the word in their student editions. Read the sentence together.
5. Review the vocabulary words **cause** and **effect** with students. Bring students back to the guiding question and how you're trying to figure out how the screeching cup makes its sound. Tell students you want to know their ideas about what is causing the sound (effect).
6. Have students write or draw their ideas about what is causing the sound in their student editions.

Whole Group

1. Tell students that today, you are going to walk them through how to plan an investigation and how to do an investigation. Encourage students to participate with you so they are prepared to do their own investigation for the next two weeks.
2. **Ask:** Using our Student-Driven Question Board, what are we trying to figure out through our investigation? **(Answers could include: How the screeching cup makes sound or what causes the screeching cup to make a sound.)**
3. ***Say:*** *This is called the Investigation Purpose. Let's write it together.*
   a. Write the Investigation Purpose, starting with "We want to find out …" on the Poster Pal, and have students write it in their student editions.

Vocabulary

4. ***Say:*** *Next, we need to plan what we will do in our investigation. A* ***plan*** *is a written list of ideas and steps that helps you do an investigation.*
5. **Ask:** What do we need to do to find out the cause of the screeching cup's sound?
   a. Using students' responses, create a list of steps in the Poster Pal of how you will find an answer to the guiding question.
   b. You may need to ask some additional questions, such as:
      - Which part(s) of the screeching cup will we need to listen to? **(Answers may include: We need to listen to all the parts to see where the sound is coming from.)**
      - Which part(s) will we need to test for vibrations? **(Answers may include: We need to touch all the parts of the screeching cup to see which parts are vibrating.)**
      - Will we need to change anything with the screeching cup to figure out our answer? **(Answers may include: We can try the screeching cup with one element missing and … for each test.)**

…wn words or draw the steps of the …ditions.

…e will need to do our investigation.

…o do our investigation? Write or …

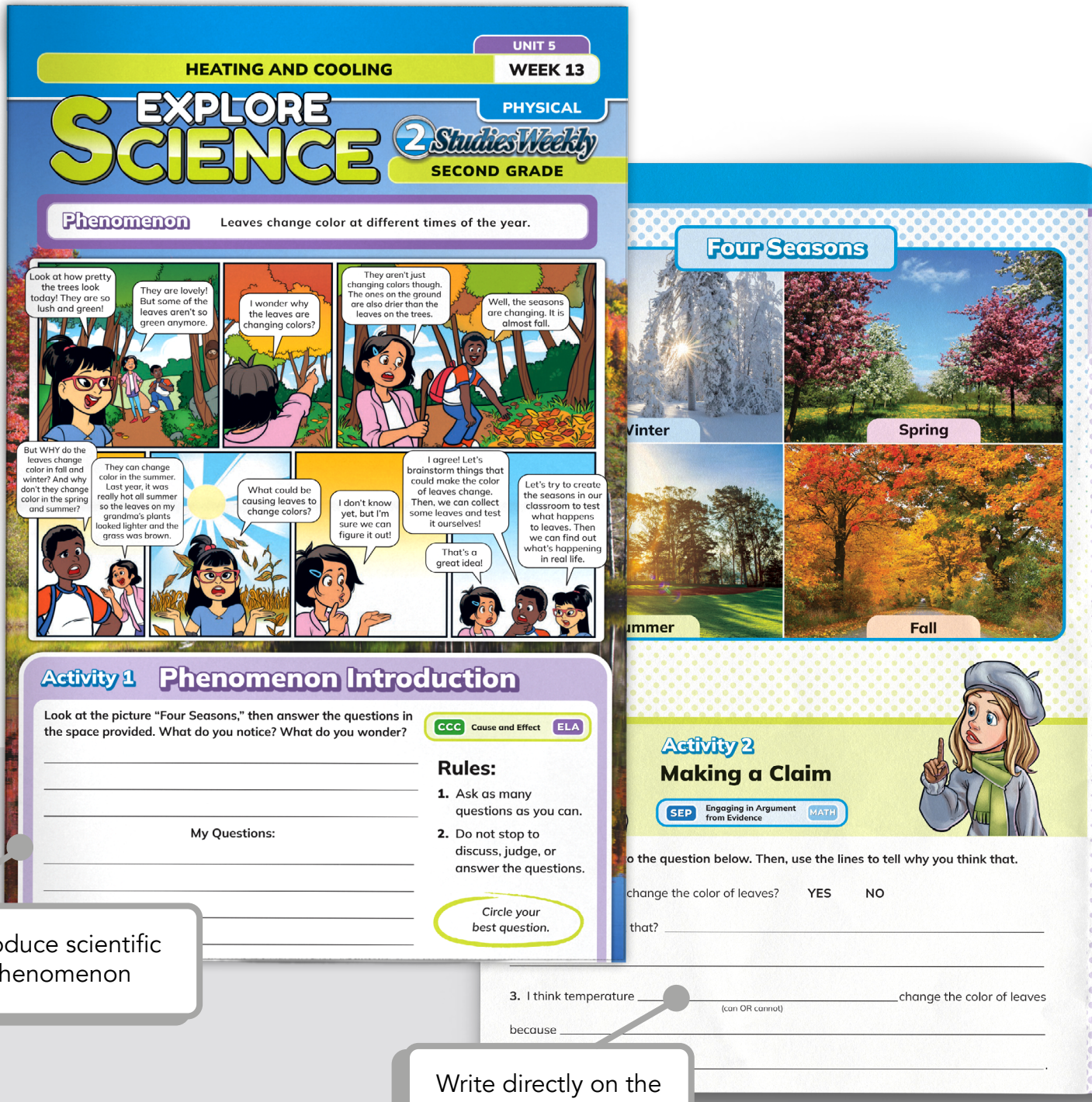
1. Tell students that when you plan an investigation, you have to think about what you might see and what it means.
2. Discuss the following questions:
   a. If your idea is correct, what will happen?
   b. If your idea is incorrect, what might or won't happen?
   c. Will the evidence help us answer our question? How? **(Students should realize that through the investigation, they will be able to see evidence to answer their question about how the screeching cup makes sound.)**

…vestigation

…11 and 12

Unit 2.12 Sound Investigation — Weeks 10, 11 and 12

StudiesWeekly



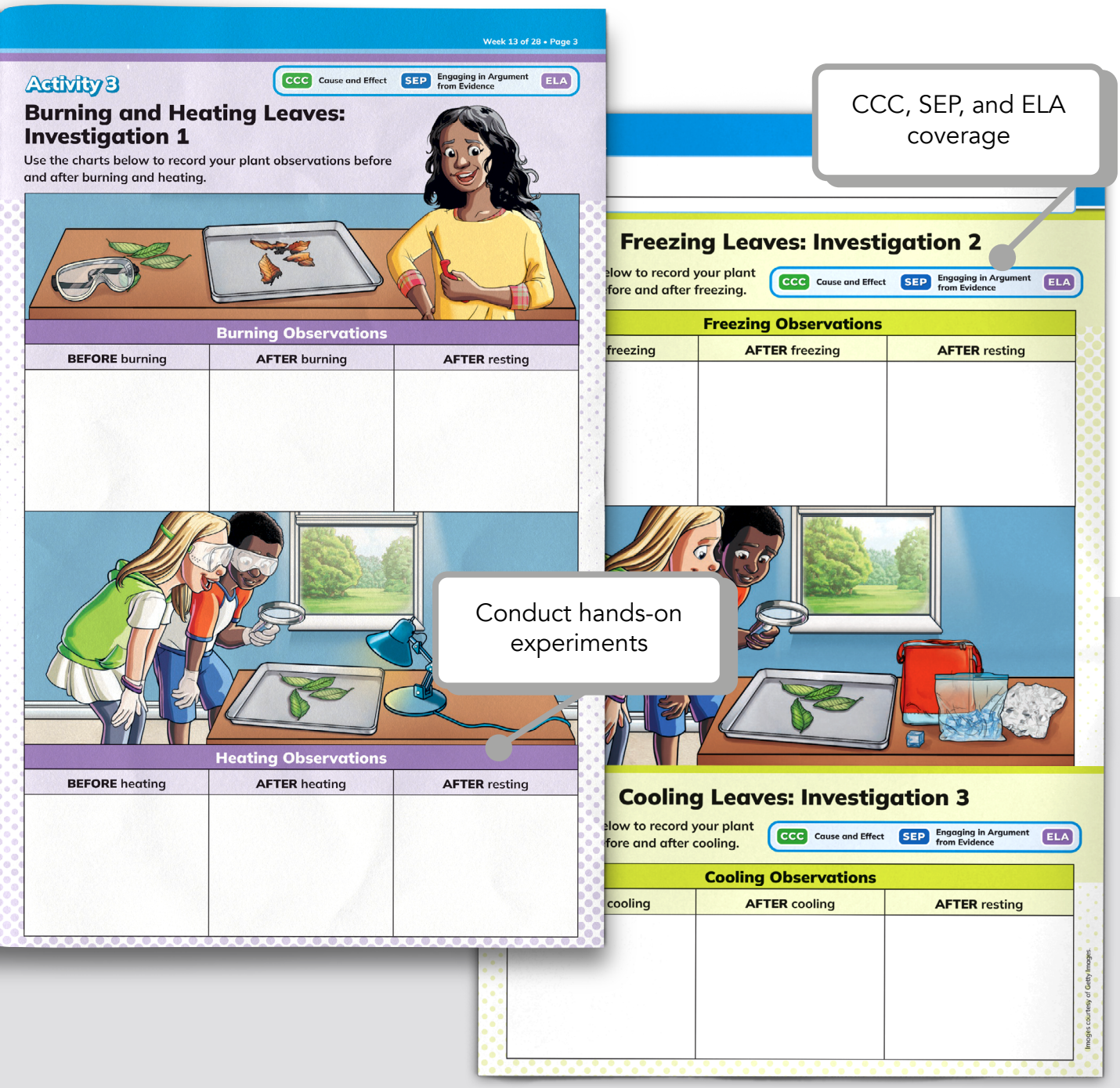
Introduce scientific phenomenon

Write directly on the print publication

GRADE 2
STUDENT EDITION

GRADE 2

STUDENT EDITION

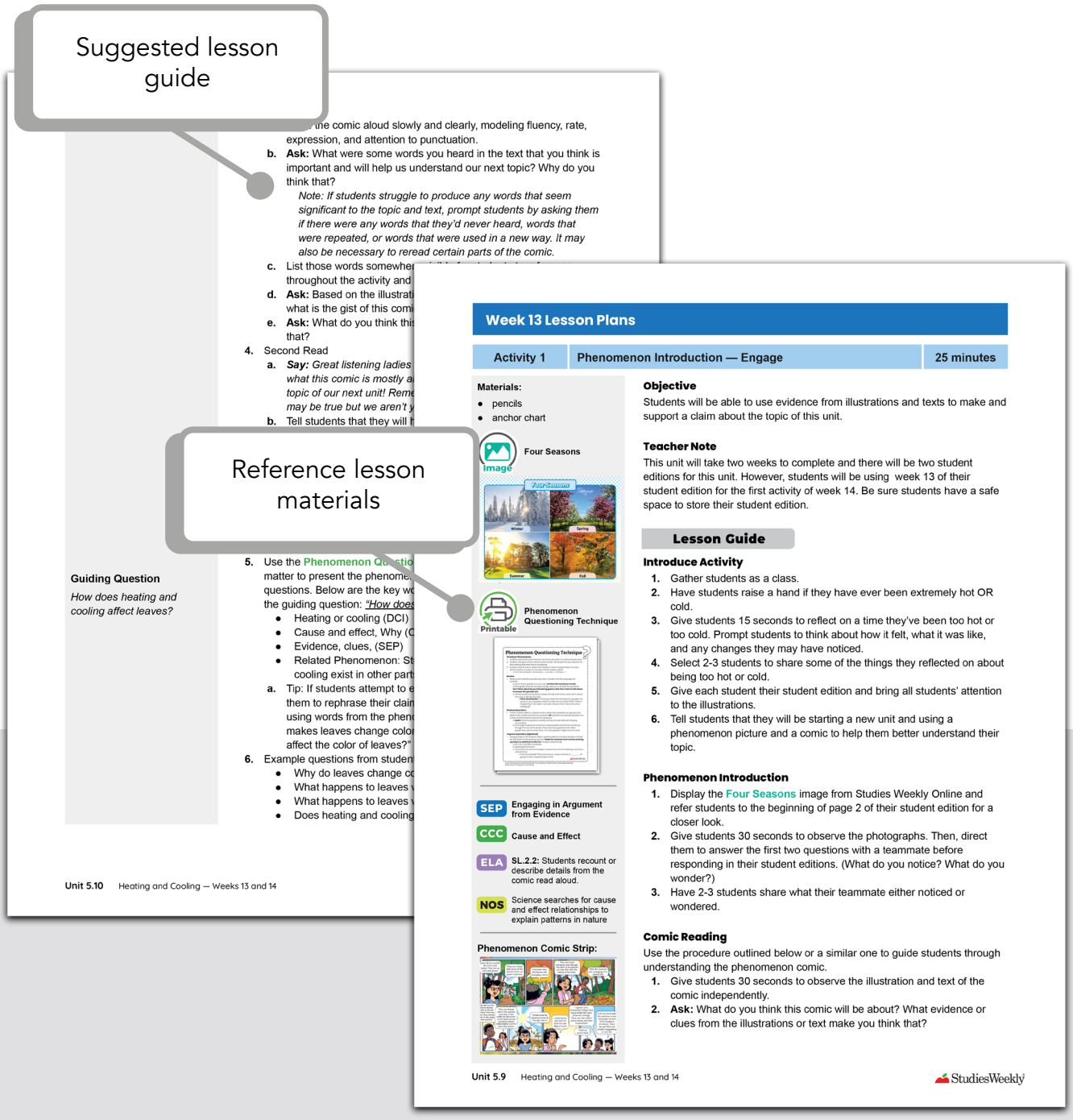


CCC, SEP, and ELA coverage

Conduct hands-on experiments

Suggested lesson guide

Reference lesson materials



the comic aloud slowly and clearly, modeling fluency, rate, expression, and attention to punctuation.

b. **Ask:** What were some words you heard in the text that you think is important and will help us understand our next topic? Why do you think that?

Note: If students struggle to produce any words that seem significant to the topic and text, prompt students by asking them if there were any words that they'd never heard, words that were repeated, or words that were used in a new way. It may also be necessary to reread certain parts of the comic.

c. List those words somewher… throughout the activity and …

d. **Ask:** Based on the illustrati… what is the gist of this comi…

e. **Ask:** What do you think thi… that?

4. Second Read

a. ***Say:*** *Great listening ladies … what this comic is mostly a… topic of our next unit! Reme… may be true but we aren't y…*

b. Tell students that they will …

Guiding Question

How does heating and cooling affect leaves?

5. Use the Phenomenon Questio… matter to present the phenome… questions. Below are the key wo… the guiding question: *"How does…*

- Heating or cooling (DCI)
- Cause and effect, Why (C…
- Evidence, clues, (SEP)
- Related Phenomenon: St… cooling exist in other part…

a. Tip: If students attempt to e… them to rephrase their claim… using words from the phen… makes leaves change color… affect the color of leaves?"

6. Example questions from studen…

- Why do leaves change co…
- What happens to leaves …
- What happens to leaves …
- Does heating and cooling…

Unit 5.10 Heating and Cooling — Weeks 13 and 14

Week 13 Lesson Plans

Activity 1	Phenomenon Introduction — Engage	25 minutes

Materials:

- pencils
- anchor chart

Image **Four Seasons**

Printable **Phenomenon Questioning Technique**

SEP Engaging in Argument from Evidence

CCC Cause and Effect

ELA **SL.2.2:** Students recount or describe details from the comic read aloud.

NOS Science searches for cause and effect relationships to explain patterns in nature

Phenomenon Comic Strip:

Objective

Students will be able to use evidence from illustrations and texts to make and support a claim about the topic of this unit.

Teacher Note

This unit will take two weeks to complete and there will be two student editions for this unit. However, students will be using week 13 of their student edition for the first activity of week 14. Be sure students have a safe space to store their student edition.

Lesson Guide

Introduce Activity

1. Gather students as a class.
2. Have students raise a hand if they have ever been extremely hot OR cold.
3. Give students 15 seconds to reflect on a time they've been too hot or too cold. Prompt students to think about how it felt, what it was like, and any changes they may have noticed.
4. Select 2-3 students to share some of the things they reflected on about being too hot or cold.
5. Give each student their student edition and bring all students' attention to the illustrations.
6. Tell students that they will be starting a new unit and using a phenomenon picture and a comic to help them better understand their topic.

Phenomenon Introduction

1. Display the Four Seasons image from Studies Weekly Online and refer students to the beginning of page 2 of their student edition for a closer look.
2. Give students 30 seconds to observe the photographs. Then, direct them to answer the first two questions with a teammate before responding in their student editions. (What do you notice? What do you wonder?)
3. Have 2-3 students share what their teammate either noticed or wondered.

Comic Reading

Use the procedure outlined below or a similar one to guide students through understanding the phenomenon comic.

1. Give students 30 seconds to observe the illustration and text of the comic independently.
2. **Ask:** What do you think this comic will be about? What evidence or clues from the illustrations or text make you think that?

Unit 5.9 Heating and Cooling — Weeks 13 and 14 StudiesWeekly

GRADE 2
TEACHER EDITION

Lessons follow the 5E Model

TEACHER EDITION

GRADE 2

Differentiation ideas

Activity 2 | **Making a Claim — Engage** | **5 minutes**

Materials:
- pencils (one per student)

Printable Self-Assessment

Objective
Students will be able to use evidence from the phenomenon activity to make a claim that they will spend the unit investigating.

Lesson Guide

Collaborative Learning

1. Tell students that they have done a great job identifying the topic of their next unit. Inform students that they will be experimenting to gather evidence to learn if changes in temperature can change the color of leaves.
Tell students that before they get started, they first need to decide if they believe heating and cooling will change a plant, and then they need to determine how to test out their claim.
Have students raise their hand if they think changes in temperature can change the color of leaves. Count the number of students who raised their hand. Record that number somewhere all students can see it.
Have students raise their hand if they think changes in temperature can NOT change the color of leaves. Count the number of students who raised their hand. Record that number beside the first number.
Math Integration:
…h number is larger?
…number is smaller?
… the words greater than OR less than, compare these two
…ers from left two right.
…Do more students believe that temperature CAN or can NOT
…e the color of leaves? Use evidence from the graph to support
…esponse.
…nts two minutes to complete the "Making a Claim" section in their
…dition.

…rief
What is this unit's topic?
What do you think we can do to figure out if temperature changes the color of leaves?
How do we see heating and cooling of plants in the real world/ the world around us?
Self-Assessment: Have students think back to the questioning exercise at the beginning of the lesson. Ask students the following questions, and have them use their thumbs to indicate how they did. Thumbs up will indicate they are doing a great job, thumbs sideways will indicate they are doing a good job but have some work to do, and thumbs down will indicate that part is really hard for them, but they are trying. Explain these three responses for asking the three questions.
   a. Did you ask as many questions as you could?
   b. Did you not stop to discuss, judge, or answer the questions?
   c. Did you improve your questions when it was time?

Ask: Have any more questions come up since we began our discussion? Record any new questions.

…idence	Student Edition Response
…nts use the space provided in their student edition to make a claim as to …her they think heating and cooling can cause changes to plants.	

…and 14 StudiesWeekly

Optional

Printable Creating a Solar Oven

Creating a Solar Oven
This unit requires students and teachers to have access to spaces that can keep a substance warm for a prolonged period of time. Coming across enough of these materials can be difficult or costly. Teachers can use this optional extension activity to guide students through making their own homemade solar oven to keep their leaves at a high temperature longer.

Optional

Printable Creating a Classroom Language

Creating a Classroom Langua…
This unit requires students to make… understanding of a scientific princip… it could be useful to give the class … exchange their thoughts with. Teach… activity to determine how to support natural language developmen… that keeps student language at the forefront of instruction.

Optional

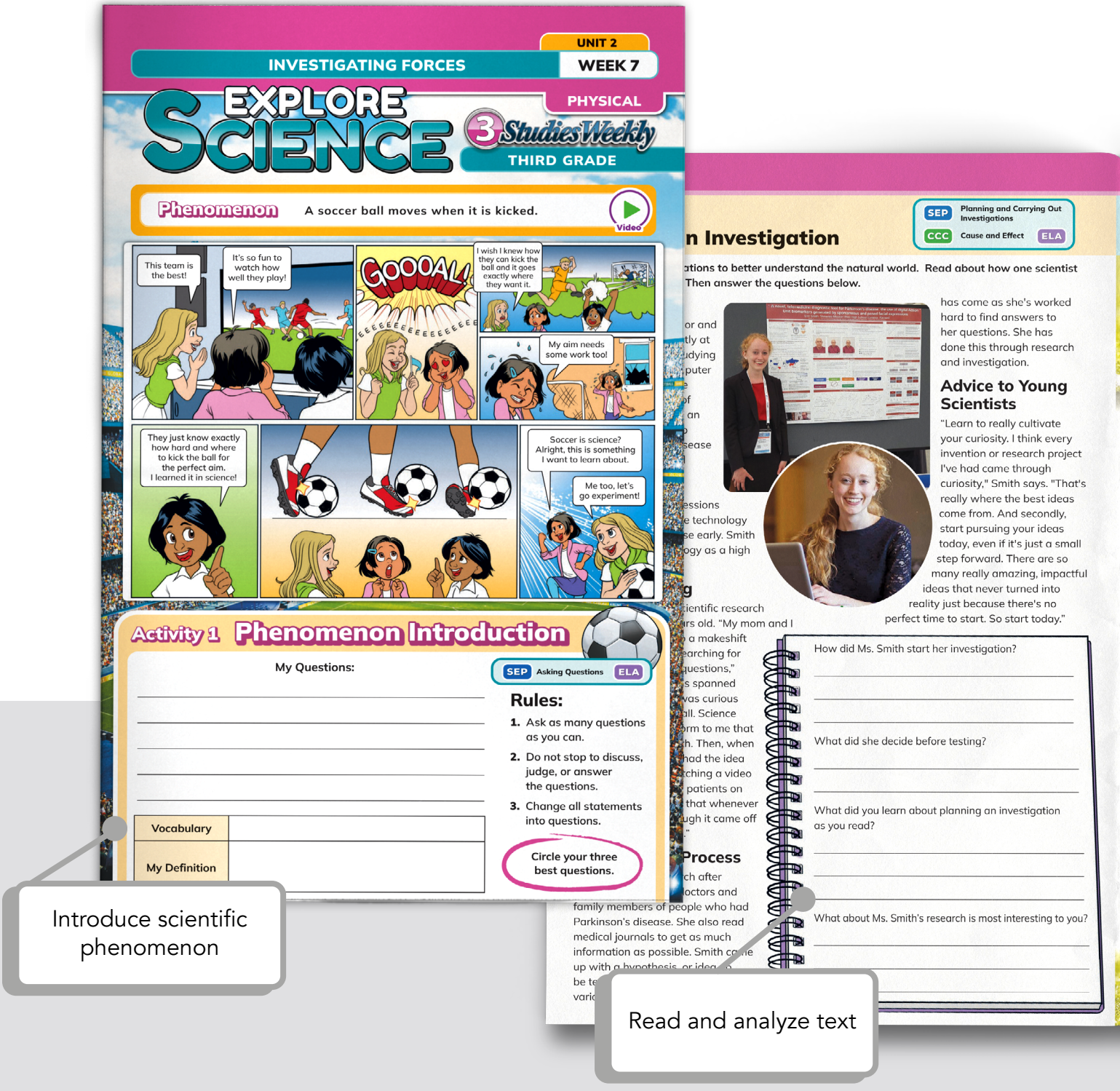
Differentiation

Developing
- If students struggle with speaking in complete sentences or providing responses to questions, provide students with sentence starters to help them produce a response to questions.
- If students have a hard time responding to the questions during the first comic reading, reread the pertinent information and stop after reading all information that can help students answer the question.

Advanced
- Have students read the comic independently.
- Have students write their responses regarding the gist of the comic. In their writing, students state a claim about what the comic is about and use evidence from the text to support their claim.
- Have students write their predictions and write whether they were right or wrong using evidence from the text.

Formative Assessment	Evidence	Self-Assessment
Printable Self-Assessment		Students respond to questions designed to get them to think critically about the phenomenon and unit topic. Then, students assess themselves on their engagement with the questioning strategy.

Unit 5.11 Heating and Cooling — Weeks 13 and 14 StudiesWeekly



Introduce scientific phenomenon

Read and analyze text

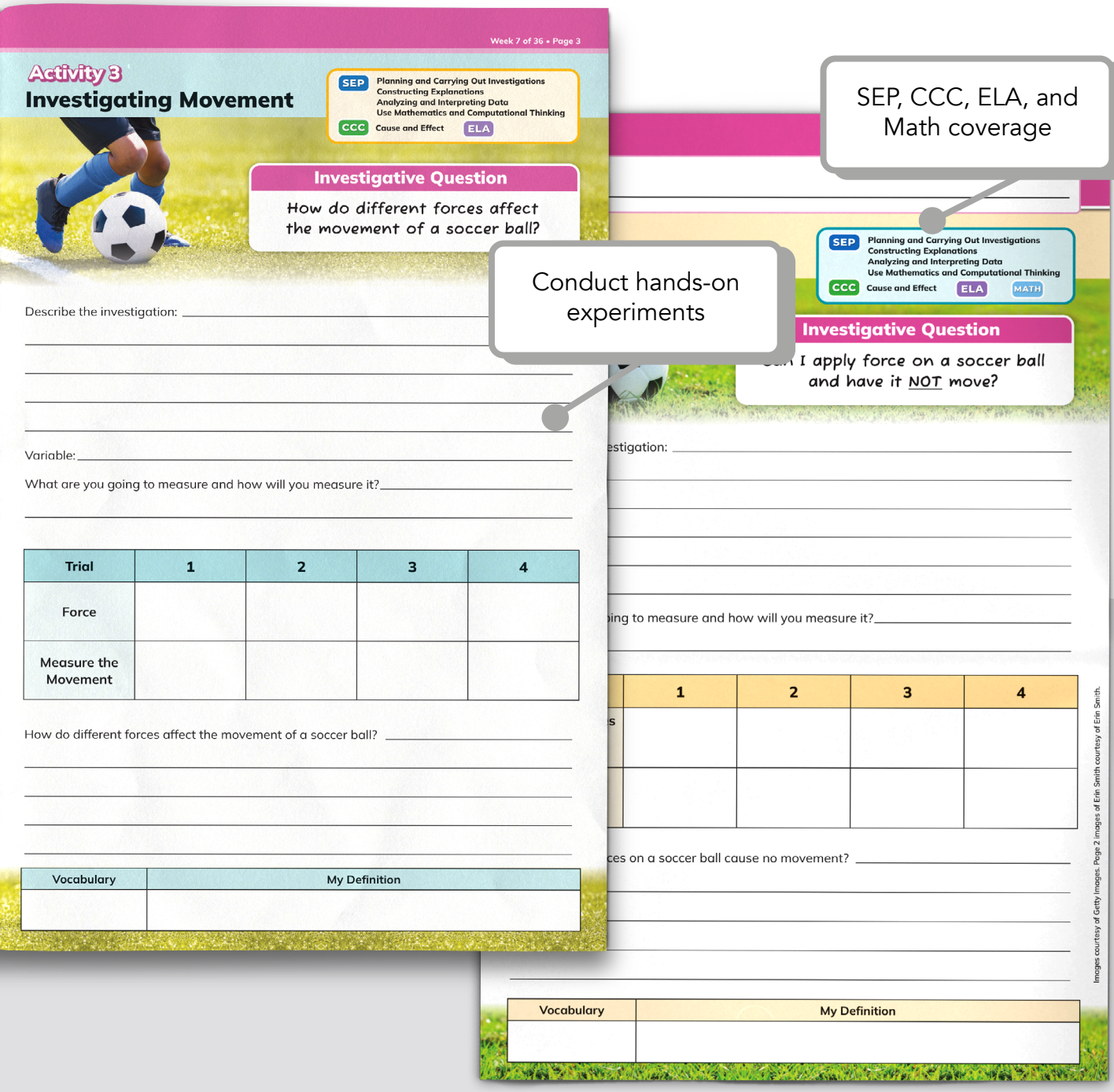
GRADE 3
STUDENT EDITION

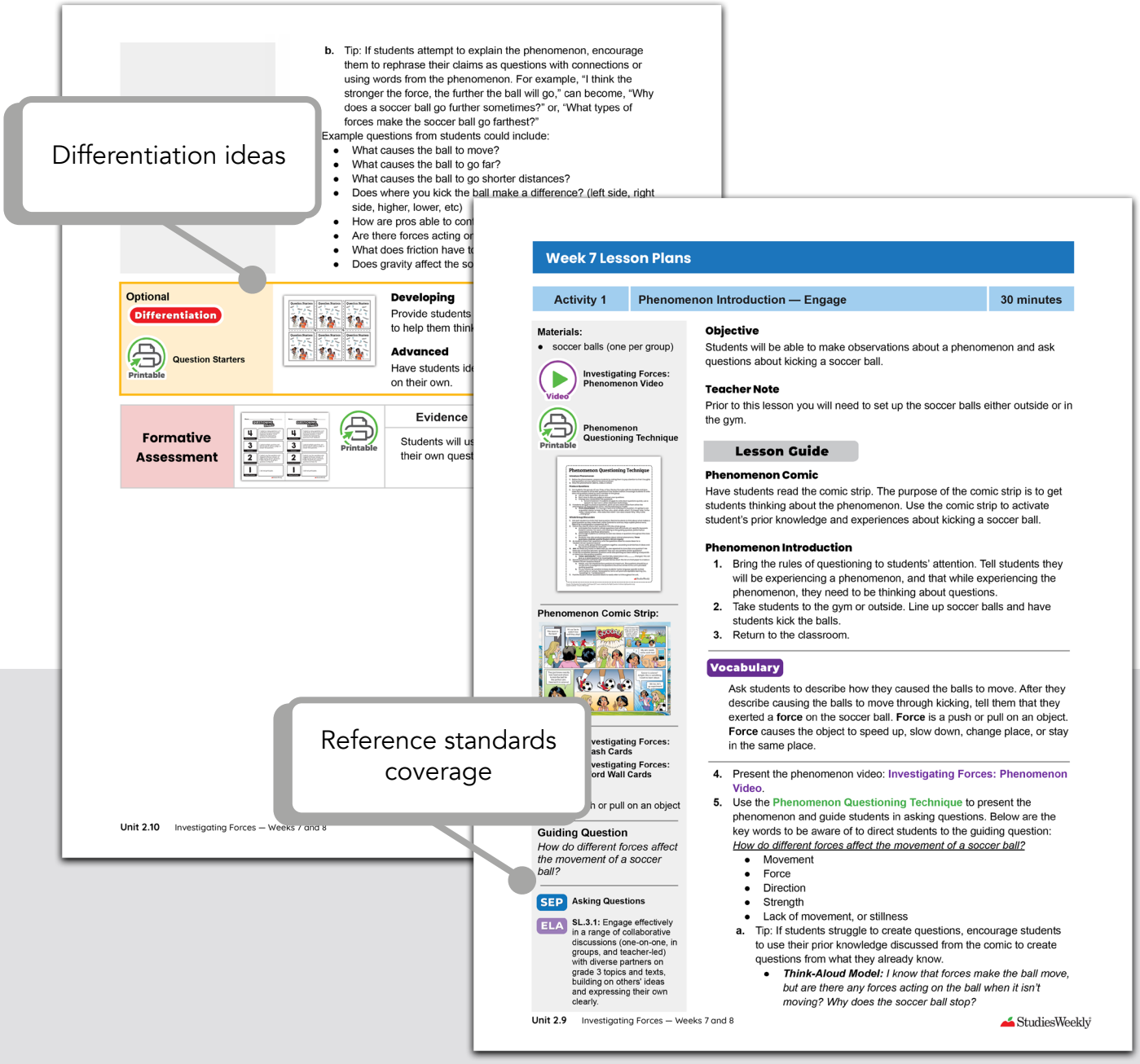
GRADE 3

STUDENT EDITION

SEP, CCC, ELA, and Math coverage

Conduct hands-on experiments

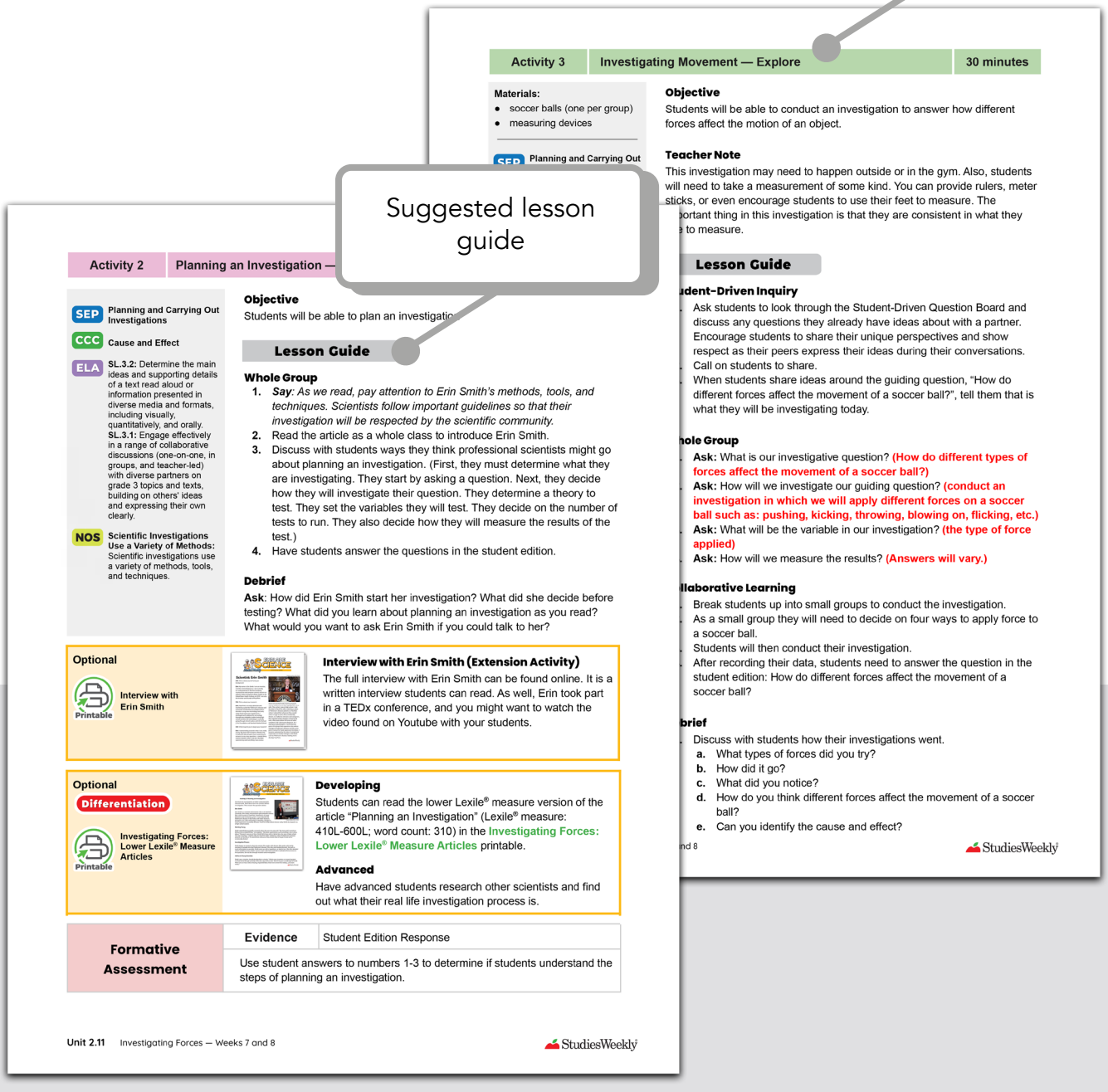




GRADE 3
TEACHER EDITION

Lessons follow the 5E Model

Suggested lesson guide



Activity 3 | Investigating Movement — Explore | 30 minutes

Materials:
- soccer balls (one per group)
- measuring devices

SEP Planning and Carrying Out

Objective
Students will be able to conduct an investigation to answer how different forces affect the motion of an object.

Teacher Note
This investigation may need to happen outside or in the gym. Also, students will need to take a measurement of some kind. You can provide rulers, meter sticks, or even encourage students to use their feet to measure. The portant thing in this investigation is that they are consistent in what they to measure.

Activity 2 | Planning an Investigation —

SEP Planning and Carrying Out Investigations

CCC Cause and Effect

ELA SL.3.2: Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. SL.3.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

NOS Scientific Investigations Use a Variety of Methods: Scientific investigations use a variety of methods, tools, and techniques.

Objective
Students will be able to plan an investigatio

Lesson Guide

Whole Group
1. ***Say**: As we read, pay attention to Erin Smith's methods, tools, and techniques. Scientists follow important guidelines so that their investigation will be respected by the scientific community.*
2. Read the article as a whole class to introduce Erin Smith.
3. Discuss with students ways they think professional scientists might go about planning an investigation. (First, they must determine what they are investigating. They start by asking a question. Next, they decide how they will investigate their question. They determine a theory to test. They set the variables they will test. They decide on the number of tests to run. They also decide how they will measure the results of the test.)
4. Have students answer the questions in the student edition.

Debrief
Ask: How did Erin Smith start her investigation? What did she decide before testing? What did you learn about planning an investigation as you read? What would you want to ask Erin Smith if you could talk to her?

Optional
Printable Interview with Erin Smith

Interview with Erin Smith (Extension Activity)
The full interview with Erin Smith can be found online. It is a written interview students can read. As well, Erin took part in a TEDx conference, and you might want to watch the video found on Youtube with your students.

Optional
Differentiation
Printable Investigating Forces: Lower Lexile® Measure Articles

Developing
Students can read the lower Lexile® measure version of the article "Planning an Investigation" (Lexile® measure: 410L-600L; word count: 310) in the Investigating Forces: Lower Lexile® Measure Articles printable.

Advanced
Have advanced students research other scientists and find out what their real life investigation process is.

Formative Assessment	Evidence	Student Edition Response
	Use student answers to numbers 1-3 to determine if students understand the steps of planning an investigation.	

Unit 2.11 Investigating Forces — Weeks 7 and 8 StudiesWeekly

Lesson Guide

dent-Driven Inquiry
- Ask students to look through the Student-Driven Question Board and discuss any questions they already have ideas about with a partner. Encourage students to share their unique perspectives and show respect as their peers express their ideas during their conversations.
- Call on students to share.
- When students share ideas around the guiding question, "How do different forces affect the movement of a soccer ball?", tell them that is what they will be investigating today.

hole Group
- **Ask:** What is our investigative question? **(How do different types of forces affect the movement of a soccer ball?)**
- **Ask:** How will we investigate our guiding question? **(conduct an investigation in which we will apply different forces on a soccer ball such as: pushing, kicking, throwing, blowing on, flicking, etc.)**
- **Ask:** What will be the variable in our investigation? **(the type of force applied)**
- **Ask:** How will we measure the results? **(Answers will vary.)**

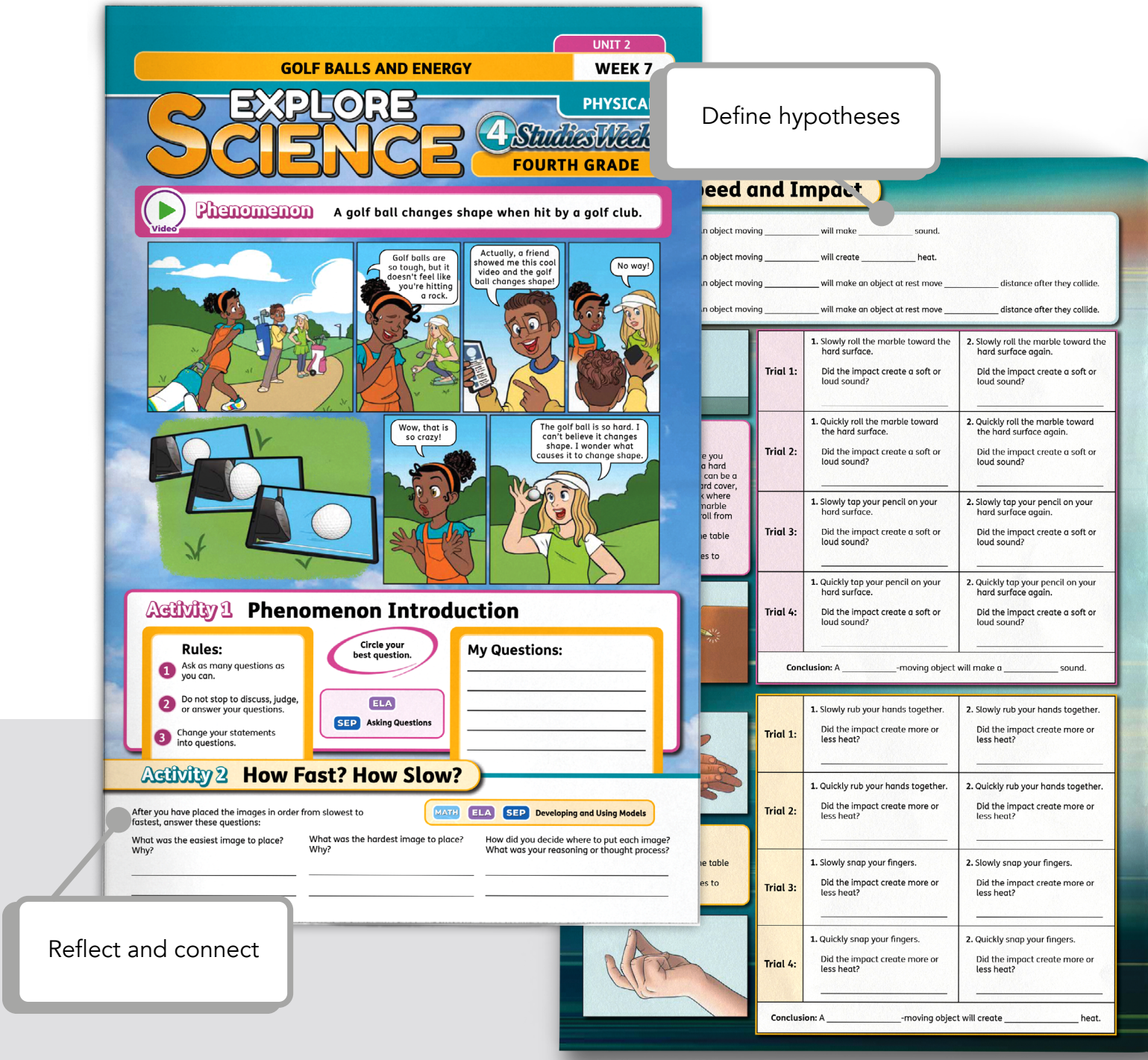
llaborative Learning
- Break students up into small groups to conduct the investigation.
- As a small group they will need to decide on four ways to apply force to a soccer ball.
- Students will then conduct their investigation.
- After recording their data, students need to answer the question in the student edition: How do different forces affect the movement of a soccer ball?

brief
- Discuss with students how their investigations went.
  - **a.** What types of forces did you try?
  - **b.** How did it go?
  - **c.** What did you notice?
  - **d.** How do you think different forces affect the movement of a soccer ball?
  - **e.** Can you identify the cause and effect?

nd 8 StudiesWeekly

TEACHER EDITION

GRADE 3



GRADE 4
STUDENT EDITION

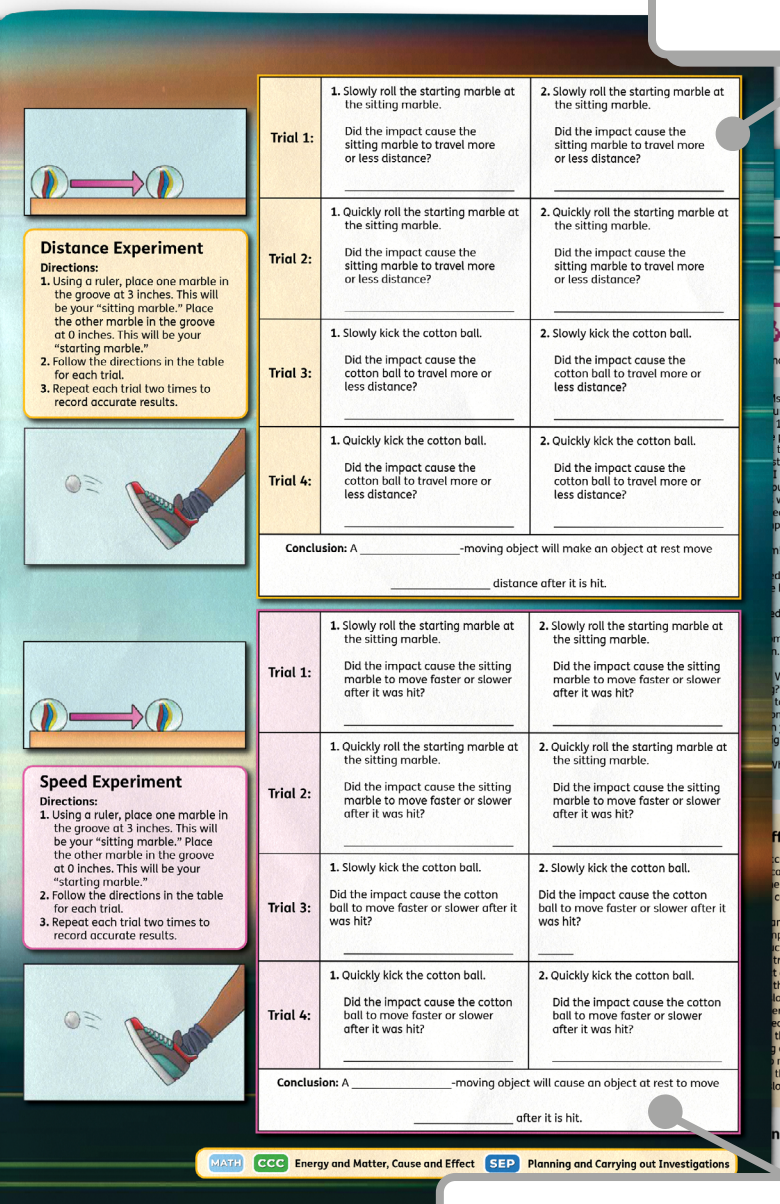
GRADE 4

Conduct experiments

Grade-level reading practice

Draw conclusions

STUDENT EDITION



Distance Experiment

Directions:
1. Using a ruler, place one marble in the groove at 3 inches. This will be your "sitting marble." Place the other marble in the groove at 0 inches. This will be your "starting marble."
2. Follow the directions in the table for each trial.
3. Repeat each trial two times to record accurate results.

Trial 1:	**1.** Slowly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to travel more or less distance? _____	**2.** Slowly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to travel more or less distance? _____
Trial 2:	**1.** Quickly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to travel more or less distance? _____	**2.** Quickly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to travel more or less distance? _____
Trial 3:	**1.** Slowly kick the cotton ball. Did the impact cause the cotton ball to travel more or less distance? _____	**2.** Slowly kick the cotton ball. Did the impact cause the cotton ball to travel more or less distance? _____
Trial 4:	**1.** Quickly kick the cotton ball. Did the impact cause the cotton ball to travel more or less distance? _____	**2.** Quickly kick the cotton ball. Did the impact cause the cotton ball to travel more or less distance? _____

Conclusion: A _____-moving object will make an object at rest move _____ distance after it is hit.

Speed Experiment

Directions:
1. Using a ruler, place one marble in the groove at 3 inches. This will be your "sitting marble." Place the other marble in the groove at 0 inches. This will be your "starting marble."
2. Follow the directions in the table for each trial.
3. Repeat each trial two times to record accurate results.

Trial 1:	**1.** Slowly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to move faster or slower after it was hit? _____	**2.** Slowly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to move faster or slower after it was hit? _____
Trial 2:	**1.** Quickly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to move faster or slower after it was hit? _____	**2.** Quickly roll the starting marble at the sitting marble. Did the impact cause the sitting marble to move faster or slower after it was hit? _____
Trial 3:	**1.** Slowly kick the cotton ball. Did the impact cause the cotton ball to move faster or slower after it was hit? _____	**2.** Slowly kick the cotton ball. Did the impact cause the cotton ball to move faster or slower after it was hit? _____
Trial 4:	**1.** Quickly kick the cotton ball. Did the impact cause the cotton ball to move faster or slower after it was hit? _____	**2.** Quickly kick the cotton ball. Did the impact cause the cotton ball to move faster or slower after it was hit? _____

Conclusion: A _____-moving object will cause an object at rest to move _____ after it is hit.

MATH CCC Energy and Matter, Cause and Effect SEP Planning and Carrying out Investigations

The Impact

...nd the article. Use the text from both readings as evidence to answer the comprehension questions.

...s. Anderson was ...ur grades for our math ... 12:00. ... posting the grades late ... to myself. I had studied ...t and I really wanted ... I pressed the refresh ...puter screen and waited ... were updated. ...ed, when they loaded. ...ped up and pushed my ...

...n!" I yelled as I ran out ...

...d into a chair that was ...e hall. The chair went ...

...d, and grabbed my toe. ...

...m said, coming out ...n. "You were going ...

... What does that have ...?" I said as I hopped ... toe.

...m said as she picked ...n you collided with the ...g impact because you ...

...What does that mean?"

"An impact is the moment two things collide, or crash into each other. Like you and that chair," Mom said, pointing to my toe and the chair.

"But how do you know it had a big impact? It's my toe that is hurting right now," I said.

"I know it was a big impact because I heard a loud noise, and I saw the chair quickly fly down the hallway," Mom said. "Just like it said in your science homework the other night. There are a few things we can observe in an impact to tell us how much speed the original object had."

I laughed as I sat down on the chair to rub my toe. "That's right," I said. "How much sound, heat, distance, and speed are produced are all indicators."

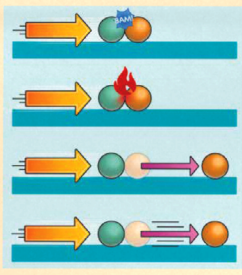
"Exactly," Mom said, tapping my nose. "And the faster you go, the more sound, heat, distance, and speed are produced. So when you collided with that chair and made a lot of noise, and the chair went flying and fell over, I knew you had been going fast."

"Good job, Mom," I said.

...ffects Impact

...curs, there are ...an observe to ...e original object ... collided with the ...

...n observe is ...pact occurs and a ...ced, it means the ...traveling at a faster ...t occurs and a quiet ...the original object ...lower speed. ...erve temperature. ...eat produced when ...then the original ...g at a faster speed. ...o heat produced ...the original object ...lower speed.



Distance is another factor we can observe. If two objects collide and the second object moves a great distance, that tells us the original object was traveling at a faster speed. If the two objects collide, but the second object doesn't move very far or stays in the same position, the original object was traveling at a slower speed.

The final factor we can observe is the speed at which the second object moves after the impact. If two objects collide and the second object starts moving at a fast speed, then we know the original object had a faster speed. If two objects collide and the second object starts moving very slowly, or not at all, then we know the original object was traveling at a slower speed.

An object that travels at a high speed will produce a greater observable impact than if the object were to travel at a low speed.

...n Questions

How did Gina's mom know she was running?

How does speed affect impact?

...n observe in ...iginal object

How would the impact have been different if Gina was walking?

ELA CCC Energy and Matter
SEP Obtaining, Evaluating, and Communicating Information

Background image courtesy of Getty Images.

Lessons follow the 5E Model

Standards coverage

Activity 2	How Fast? How Slow? — Explore	30 minutes

Materials:
- scissors (one per student)
- glue

Movement and Speed How Fast? How Slow? Printable

ELA **SL.4.1.C:** Pose and respond to specific questions to clarify or follo up on information, and ma comments that contribute the discussion and link to the remarks of others.

MATH **MP2:** Reason abstractly a quantitatively.

SEP **Developing and Using Models**

Objective
Students will be able to order the relative speed of objects.

Lesson Guide

Student-Driven Inquiry
1. Display the printable **Movement and Speed**. Have students observe the pictures and discuss the questions with a partner.
2. Call on students to share their th
   a. As students share ideas fo movement?" Clarify the co Movement is a change in p
   b. As students share ideas fo speed?" Clarify the concep or slow an object moves.
3. After students have shared thei Student-Driven Question Board that were most important to inve "Why does the golf ball change
   - Guide students to move to How can we compare spee
4. To further investigate these que in terms of their relative speed u printable.

Collaborative Learning
1. Introduce the activity "How Fast
2. While students work, circulate t
1. Review the discussio question Slow?"
2. Call on students to share thei
3. Tell students to think about a tim a bike or scooter, or simply runn moment and imagine being in th
4. Ask students to think about how slow:
   - What did your surroundin **students should sugge surroundings are blurry slower, surroundings a easier to see, etc.)**

Unit 2.11 Golf Balls and Energy — Weeks 7 and 8

Week 7 Lesson Plans

Activity 1	Phenomenon Introduction — Engage	30 minutes

Materials:
- golf balls (one per group)

Golf Balls and Energy: Phenomenon Video

Phenomenon Questioning Technique Printable

SEP **Asking Questions**

ELA **SL.4.1.C:** Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.

Phenomenon Comic Strip:

Guiding Question

Why does the golf ball change shape?

Objective
Students will be able to make observations and ask questions about why the golf ball changed shape.

Teacher Note
The students' initial ideas and understanding may include some misconceptions. However, at this point, do not correct any false assumptions. Rather, let students discuss, and encourage them to revise their initial ideas throughout the unit as new evidence builds on their prior knowledge.

Lesson Guide

Phenomenon Comic
Have students read the phenomenon comic strip in the student edition. The purpose of the comic strip is to get students thinking about what caused the golf ball to change shape. Use the comic strip to activate students' prior knowledge and experience around hitting, kicking, or striking sports balls.

Collaborative Learning
1. When students finish, place them in small groups. Give each small group one golf ball to observe.
2. Post these questions in a place where all students can see them:
   a. How would you describe a golf ball? Is it soft, hard, big, small, etc.?
   b. What experiences have you had with golf balls?

Discussion
1. Invite the students to share their own experiences with golf balls.
2. Allow all possible answers to be shared.
   a. Tip: Just collect ideas. Don't correct, confirm, or teach anything at this point.

Introduce Phenomenon
1. Present the **Golf Balls and Energy: Phenomenon Video**.
2. Use the **Phenomenon Questioning Technique** printable to present the phenomenon and guide students in asking questions. Below are key words to be aware of when directing students toward the guiding question: *Why does the golf ball change shape?*
   - golf ball, golf club, driver
   - motion, movement, speed
   - force, impact, collide
   - shape, hard, soft, squish, compact

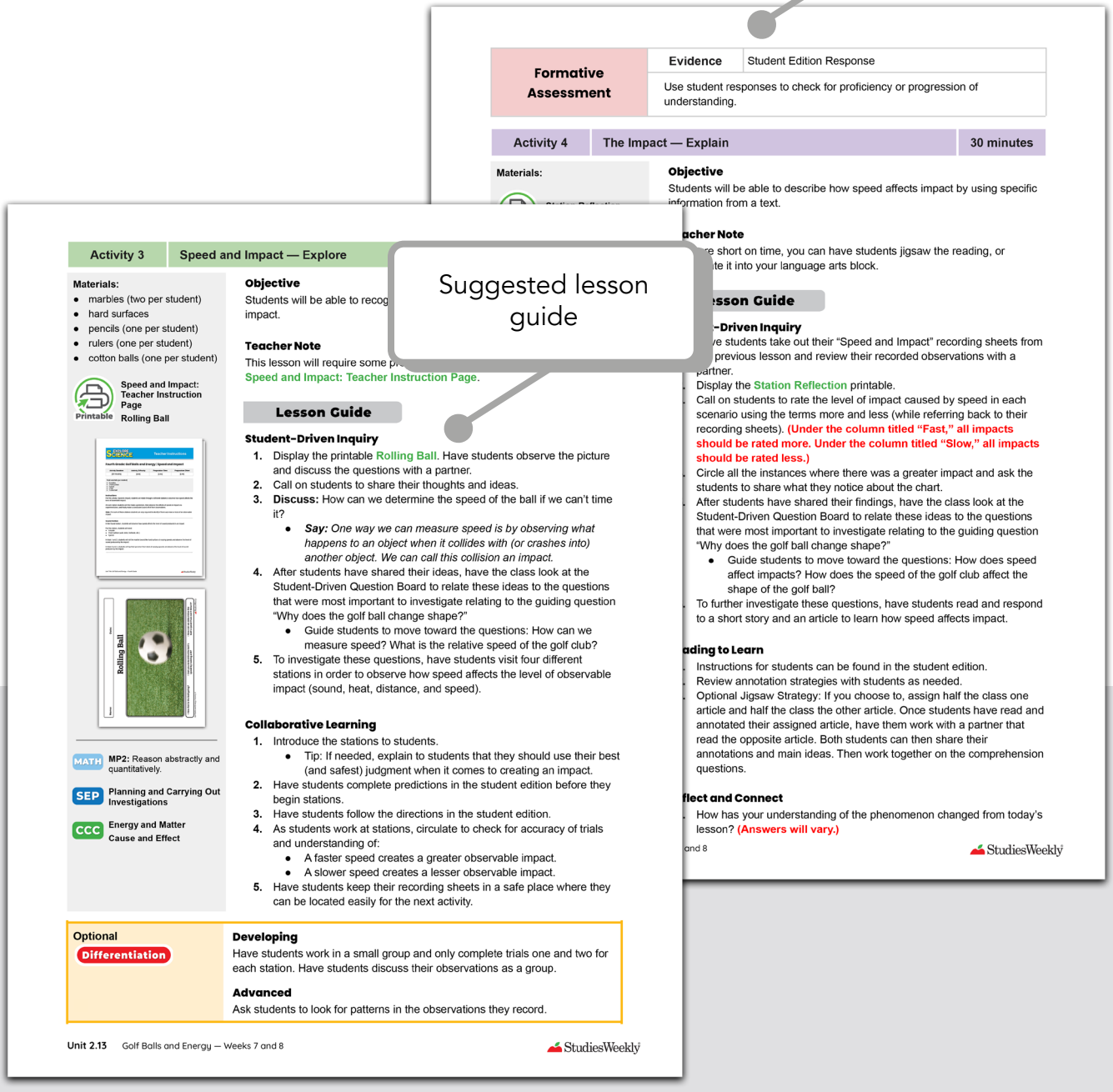
   Example questions from students could include:
   - What is speed?
   - How can we compare speeds of different objects?
   - How can we measure speed?
   - What is the relative speed of the golf club?

Unit 2.9 Golf Balls and Energy — Weeks 7 and 8 StudiesWeekly

GRADE 4
TEACHER EDITION

Ready-made assessments

Suggested lesson guide



Formative Assessment	Evidence	Student Edition Response
	Use student responses to check for proficiency or progression of understanding.	

Activity 4	The Impact — Explain	30 minutes

Materials:

Objective
Students will be able to describe how speed affects impact by using specific information from a text.

acher Note
re short on time, you can have students jigsaw the reading, or te it into your language arts block.

esson Guide

-Driven Inquiry
ve students take out their "Speed and Impact" recording sheets from previous lesson and review their recorded observations with a partner.
Display the Station Reflection printable.
Call on students to rate the level of impact caused by speed in each scenario using the terms more and less (while referring back to their recording sheets). **(Under the column titled "Fast," all impacts should be rated more. Under the column titled "Slow," all impacts should be rated less.)**
Circle all the instances where there was a greater impact and ask the students to share what they notice about the chart.
After students have shared their findings, have the class look at the Student-Driven Question Board to relate these ideas to the questions that were most important to investigate relating to the guiding question "Why does the golf ball change shape?"
- Guide students to move toward the questions: How does speed affect impacts? How does the speed of the golf club affect the shape of the golf ball?

To further investigate these questions, have students read and respond to a short story and an article to learn how speed affects impact.

ading to Learn
Instructions for students can be found in the student edition.
Review annotation strategies with students as needed.
Optional Jigsaw Strategy: If you choose to, assign half the class one article and half the class the other article. Once students have read and annotated their assigned article, have them work with a partner that read the opposite article. Both students can then share their annotations and main ideas. Then work together on the comprehension questions.

flect and Connect
How has your understanding of the phenomenon changed from today's lesson? **(Answers will vary.)**

and 8 StudiesWeekly

Activity 3	Speed and Impact — Explore

Materials:
- marbles (two per student)
- hard surfaces
- pencils (one per student)
- rulers (one per student)
- cotton balls (one per student)

Printable **Speed and Impact: Teacher Instruction Page**
Rolling Ball

MATH **MP2:** Reason abstractly and quantitatively.

SEP **Planning and Carrying Out Investigations**

CCC **Energy and Matter**
Cause and Effect

Objective
Students will be able to recog
impact.

Teacher Note
This lesson will require some pr
Speed and Impact: Teacher Instruction Page.

Lesson Guide

Student-Driven Inquiry
1. Display the printable Rolling Ball. Have students observe the picture and discuss the questions with a partner.
2. Call on students to share their thoughts and ideas.
3. **Discuss:** How can we determine the speed of the ball if we can't time it?
   - ***Say:*** *One way we can measure speed is by observing what happens to an object when it collides with (or crashes into) another object. We can call this collision an impact.*
4. After students have shared their ideas, have the class look at the Student-Driven Question Board to relate these ideas to the questions that were most important to investigate relating to the guiding question "Why does the golf ball change shape?"
   - Guide students to move toward the questions: How can we measure speed? What is the relative speed of the golf club?
5. To investigate these questions, have students visit four different stations in order to observe how speed affects the level of observable impact (sound, heat, distance, and speed).

Collaborative Learning
1. Introduce the stations to students.
   - Tip: If needed, explain to students that they should use their best (and safest) judgment when it comes to creating an impact.
2. Have students complete predictions in the student edition before they begin stations.
3. Have students follow the directions in the student edition.
4. As students work at stations, circulate to check for accuracy of trials and understanding of:
   - A faster speed creates a greater observable impact.
   - A slower speed creates a lesser observable impact.
5. Have students keep their recording sheets in a safe place where they can be located easily for the next activity.

Optional **Differentiation**

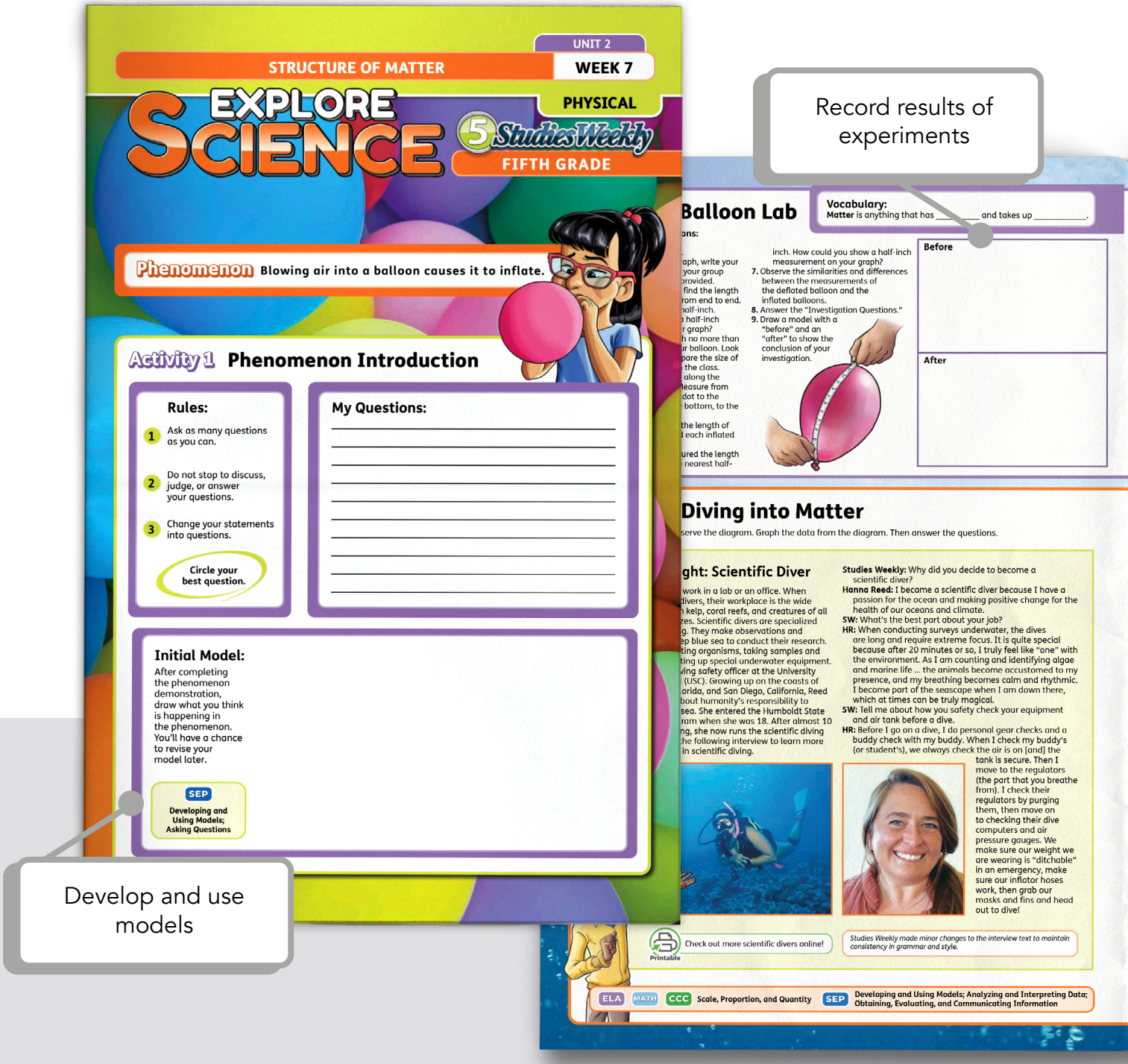
Developing
Have students work in a small group and only complete trials one and two for each station. Have students discuss their observations as a group.

Advanced
Ask students to look for patterns in the observations they record.

Unit 2.13 Golf Balls and Energy — Weeks 7 and 8 StudiesWeekly

TEACHER EDITION

GRADE 4



Record results of experiments

Develop and use models

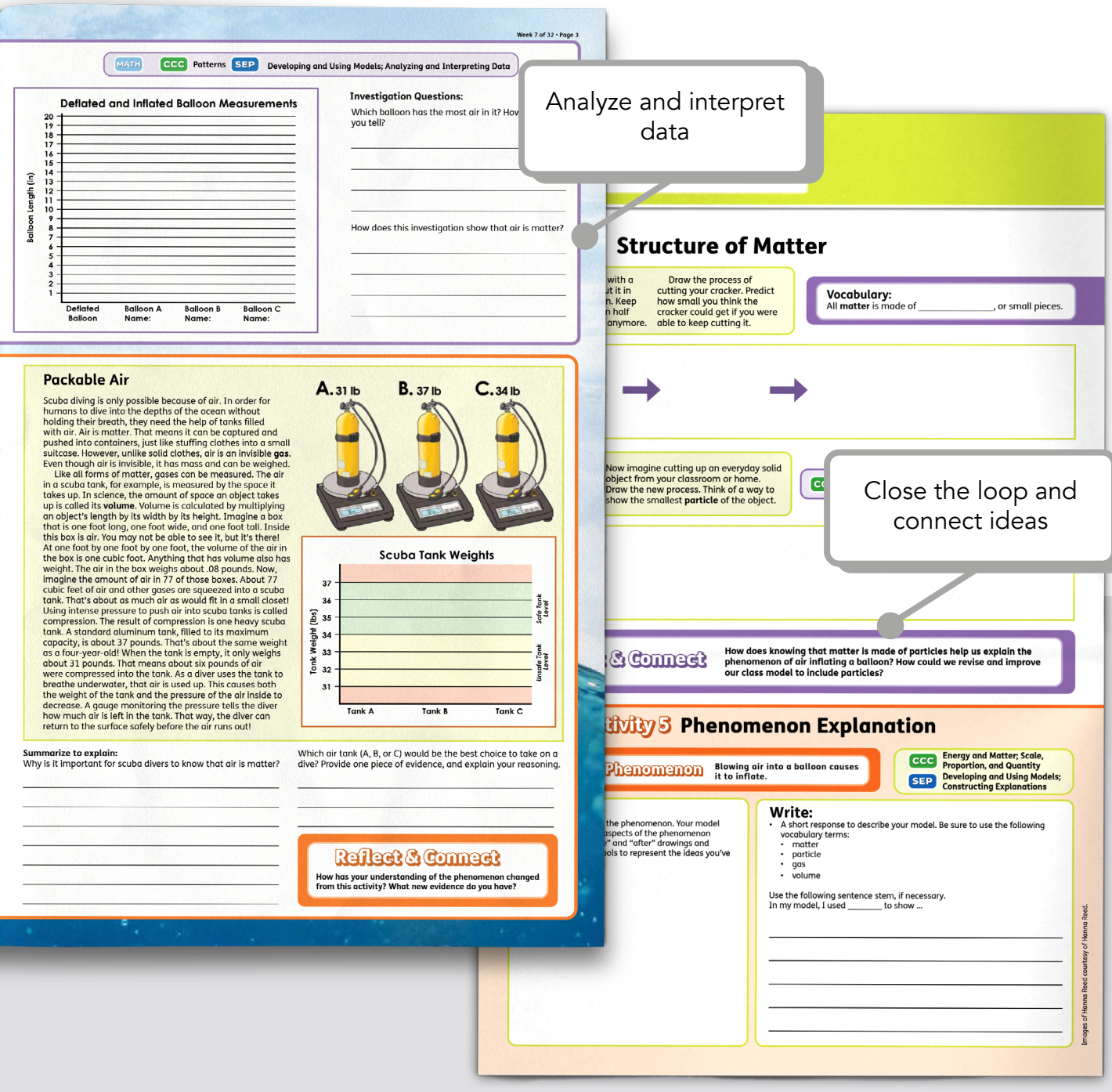
GRADE 5
STUDENT EDITION

GRADE 5

Analyze and interpret data

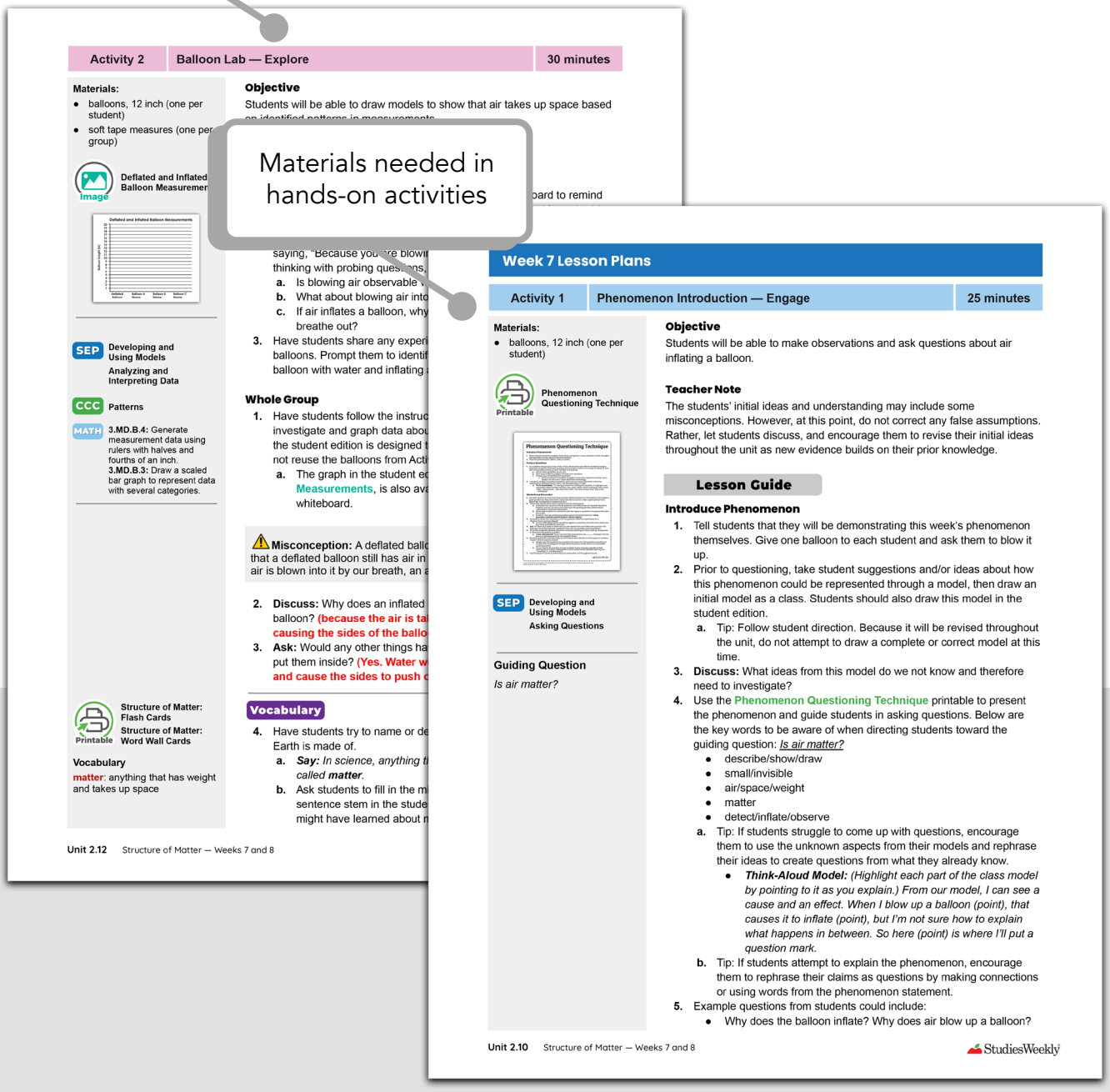
Close the loop and connect ideas

STUDENT EDITION



Lessons follow the 5E Model

Materials needed in hands-on activities



Activity 2 | Balloon Lab — Explore | 30 minutes

Materials:
- balloons, 12 inch (one per student)
- soft tape measures (one per group)

Image: Deflated and Inflated Balloon Measuremer

SEP Developing and Using Models
Analyzing and Interpreting Data

CCC Patterns

MATH **3.MD.B.4:** Generate measurement data using rulers with halves and fourths of an inch.
3.MD.B.3: Draw a scaled bar graph to represent data with several categories.

Printable: Structure of Matter: Flash Cards
Structure of Matter: Word Wall Cards

Vocabulary
matter: anything that has weight and takes up space

Objective
Students will be able to draw models to show that air takes up space based

Whole Group
1. Have students follow the instruc
   a. The graph in the student ed Measurements, is also ava whiteboard.
2. **Discuss:** Why does an inflated balloon? (because the air is ta causing the sides of the ballo
3. **Ask:** Would any other things ha put them inside? (Yes. Water w and cause the sides to push o
4. Have students try to name or de Earth is made of.
   a. ***Say:*** *In science, anything t called* ***matter****.*
   b. Ask students to fill in the m sentence stem in the stude might have learned about n

Misconception: A deflated ballo that a deflated balloon still has air in air is blown into it by our breath, an a

Vocabulary

Unit 2.12 Structure of Matter — Weeks 7 and 8

Week 7 Lesson Plans

Activity 1 | Phenomenon Introduction — Engage | 25 minutes

Materials:
- balloons, 12 inch (one per student)

Printable: Phenomenon Questioning Technique

SEP Developing and Using Models
Asking Questions

Guiding Question
Is air matter?

Objective
Students will be able to make observations and ask questions about air inflating a balloon.

Teacher Note
The students' initial ideas and understanding may include some misconceptions. However, at this point, do not correct any false assumptions. Rather, let students discuss, and encourage them to revise their initial ideas throughout the unit as new evidence builds on their prior knowledge.

Lesson Guide

Introduce Phenomenon
1. Tell students that they will be demonstrating this week's phenomenon themselves. Give one balloon to each student and ask them to blow it up.
2. Prior to questioning, take student suggestions and/or ideas about how this phenomenon could be represented through a model, then draw an initial model as a class. Students should also draw this model in the student edition.
   a. Tip: Follow student direction. Because it will be revised throughout the unit, do not attempt to draw a complete or correct model at this time.
3. **Discuss:** What ideas from this model do we not know and therefore need to investigate?
4. Use the Phenomenon Questioning Technique printable to present the phenomenon and guide students in asking questions. Below are the key words to be aware of when directing students toward the guiding question: *Is air matter?*
   - describe/show/draw
   - small/invisible
   - air/space/weight
   - matter
   - detect/inflate/observe
   a. Tip: If students struggle to come up with questions, encourage them to use the unknown aspects from their models and rephrase their ideas to create questions from what they already know.
      - ***Think-Aloud Model:*** *(Highlight each part of the class model by pointing to it as you explain.) From our model, I can see a cause and an effect. When I blow up a balloon (point), that causes it to inflate (point), but I'm not sure how to explain what happens in between. So here (point) is where I'll put a question mark.*
   b. Tip: If students attempt to explain the phenomenon, encourage them to rephrase their claims as questions by making connections or using words from the phenomenon statement.
5. Example questions from students could include:
   - Why does the balloon inflate? Why does air blow up a balloon?

Unit 2.10 Structure of Matter — Weeks 7 and 8 StudiesWeekly

GRADE 5
TEACHER EDITION

Suggested lesson guide

Differentiation strategies

TEACHER EDITION

GRADE 5

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