CAROLINA
UNLEASH LEARNING™

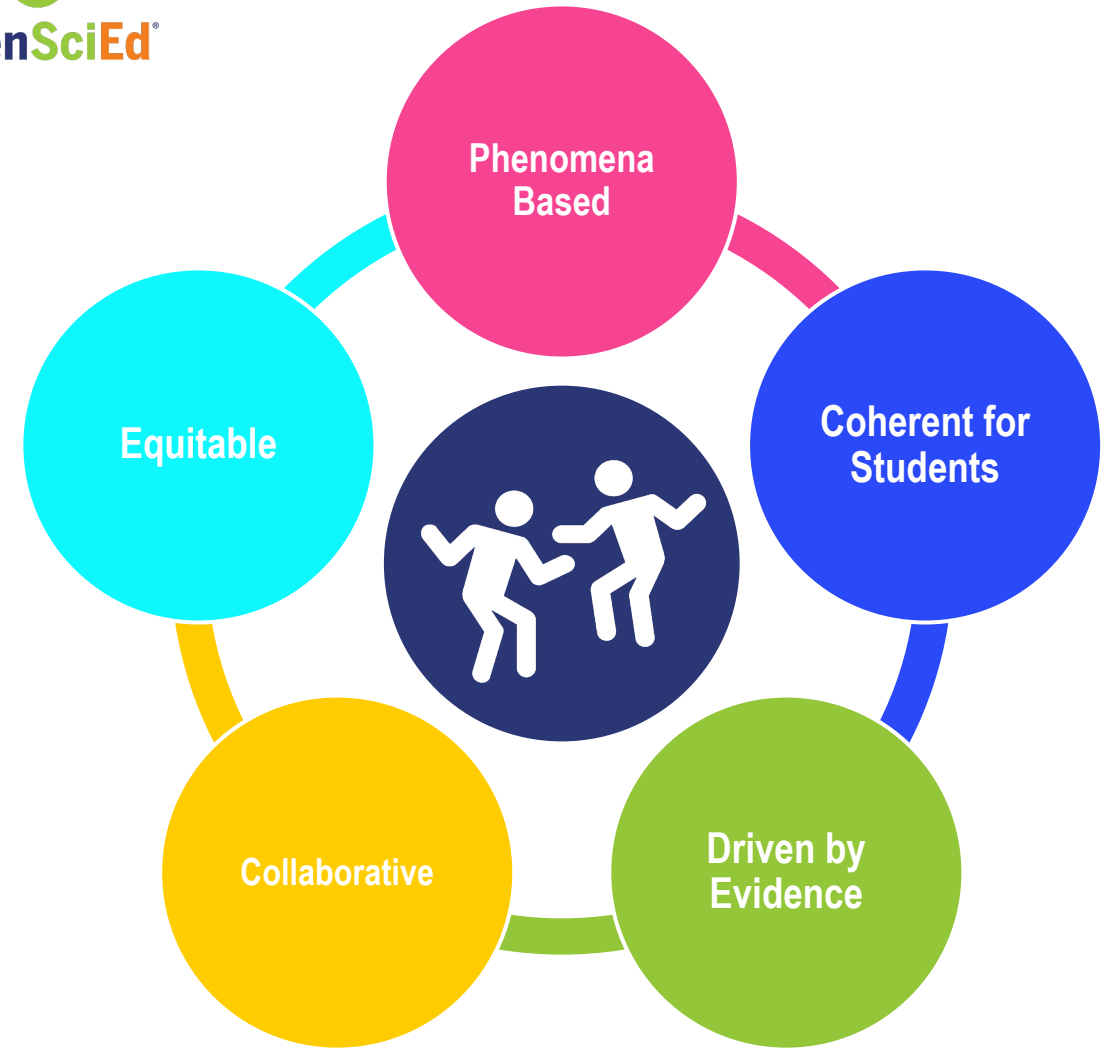
Science in Action: Step Into the Student Experience with Carolina + OpenSciEd Elementary (K-5)



CAROLINA® + OpenSciEd®

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Designed and built with students front and center



- Exploration is driven by **students'** questions and ideas
- Builds on **students'** prior knowledge and experiences
- **Students** use evidence to revise their thinking
- **Students** figure out ideas as a classroom community

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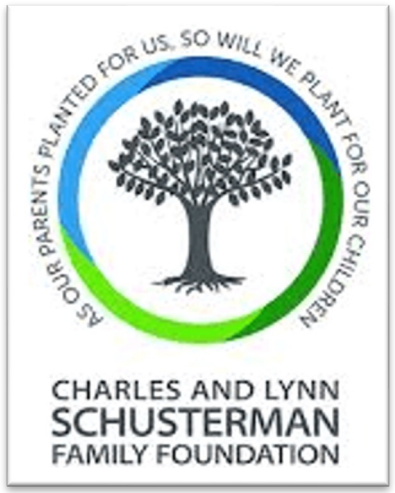
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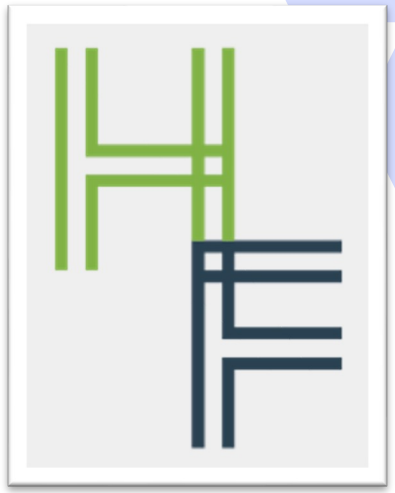
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Developed by leading education and research institutions

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Dana Center Team

Northwestern University Team

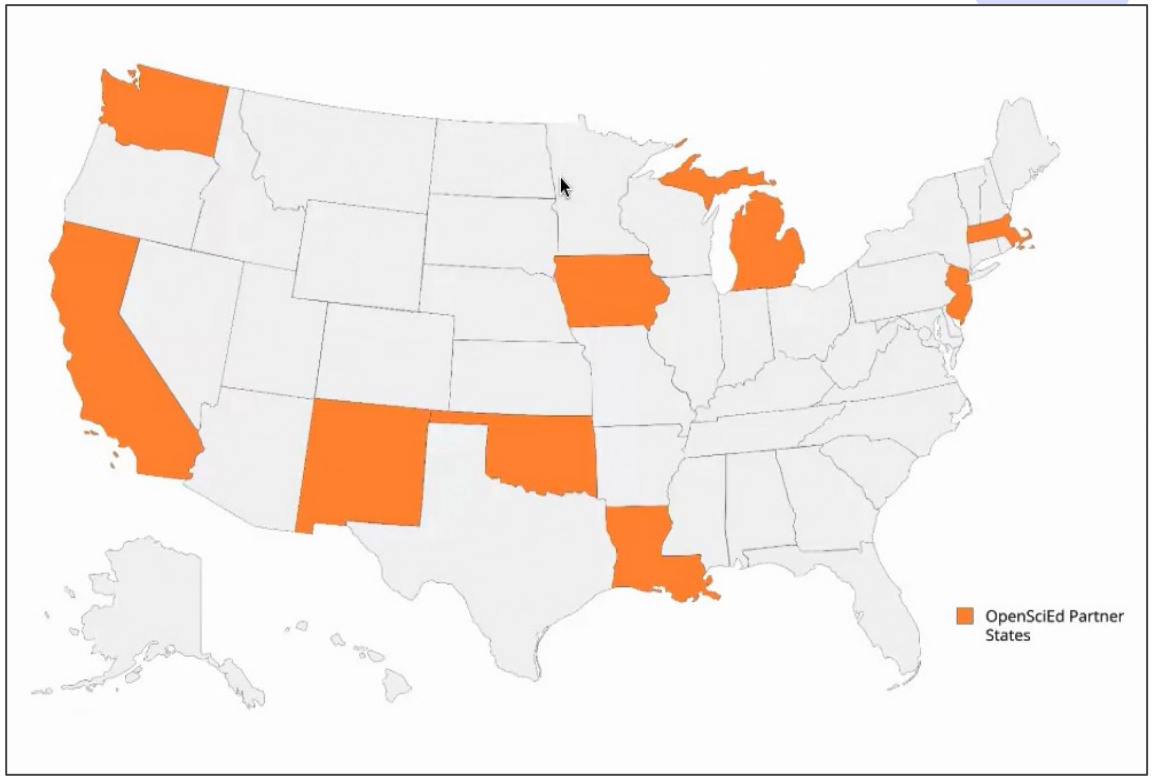
Boston College Team

University of Colorado Boulder Team

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Field Test

- 9 partner states
- Field tested by 450+ teachers and about 10,000 students



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Pathways to Adoption

OPEN EDUCATIONAL RESOURCE (OER)

Download the learning materials freely



OpenSciEd CERTIFIED CAROLINA® VERSION

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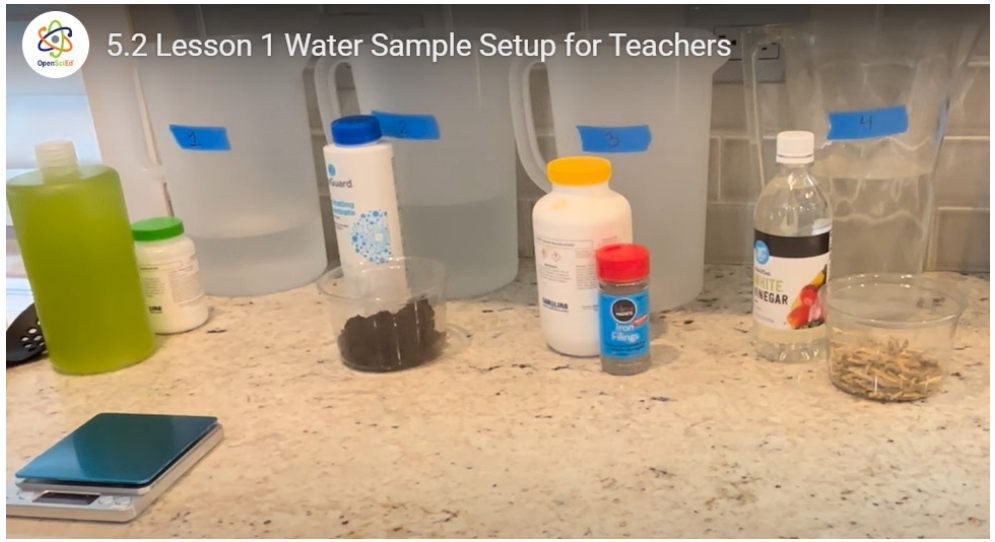
Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
K.1 Energy: Sunlight K-PS3-1, K-PS3-2, K-2-ETS1-1, K-2-ETS1-2	**1.1 Waves: Light** 1-PS4-2, 1-PS4-3	**2.1 Earth: Land Changing Shape** 2-ESS1-1, 2-ESS2-1, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3	**3.1 Forces & Interactions** 3-PS2-1, 3-PS2-2, 3-PS2-3, 3-PS2-4, 3-5-ETS1-1, 3-5-ETS1-3	**4.1 Energy Transfer: Collisions** 4-PS3-1, 4-PS3-3	**5.1 Ecosystems & Matter Cycling** 5-PS1-1, 5-PS3-1, 5-LS1-1, 5-LS2-1
K.2 Weather K-ESS2-1, K-ESS3-2	**1.2 Waves: Sound** 1-PS4-1, 1-PS4-4, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3	**2.2 Structure & Properties of Matter** 2-PS1-1, 2-PS1-2, 2-PS1-3, 2-PS1-4, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3	**3.2 Weather & Hazards** 3-ESS2-1, 3-ESS2-2, 3-ESS3-1, 3-5-ETS1-2	**4.2 Energy Transfer: Electricity** 4-PS3-2, 4-PS3-4, 4-PS4-3, 4-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-3	**5.2 Matter Properties** 5-PS1-2, 5-PS1-3, 5-PS1-4, 3-5-ETS1-1, 3-5-ETS1-3
K.3 Forces & Motion K-PS2-1, K-PS2-2, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3	**1.3 Space: Sky Patterns** 1-ESS1-1, 1-ESS1-2	**2.3 Habitats & Biodiversity** 2-LS4-1, 2-ESS2-2, 2-ESS2-3	**3.3 Trait Variations** 3-LS1-1, 3-LS3-1, 3-LS3-2, 3-LS4-1, 3-LS4-2	**4.3 Earth Processes** 4-PS4-1, 4-ESS1-1, 4-ESS2-1, 4-ESS2-2, 4-ESS3-2, 3-5-ETS1-2	**5.3 Earth Systems** 5-ESS2-1, 5-ESS2-2, 5-ESS3-1, 3-5-ETS1-2
K.4 Ecosystems K-LS1-1, K-ESS2-2, K-ESS3-1, K-ESS3-3	**1.4 Animal & Plant Traits** 1-LS1-1, 1-LS1-2, 1-LS3-1, K-2-ETS1-1, K-2-ETS1-2	**2.4 Plants** 2-LS2-1, 2-LS2-2	**3.4 Ecosystem Change & Survival** 3-LS2-1, 3-LS4-3, 3-LS4-4, 3-5-ETS1-2	**4.4 Structure & Function** 4-LS1-1, 4-LS1-2, 4-PS4-2	**5.4 Earth in the Universe** 5-ESS1-1, 5-ESS1-2, 5-PS2-1

Updated 7/29/2024

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5.2 Matter Properties



- Requires teachers to prepare exact measurements
- Teacher prep ~20 minutes per group (2.5-3 hours total)



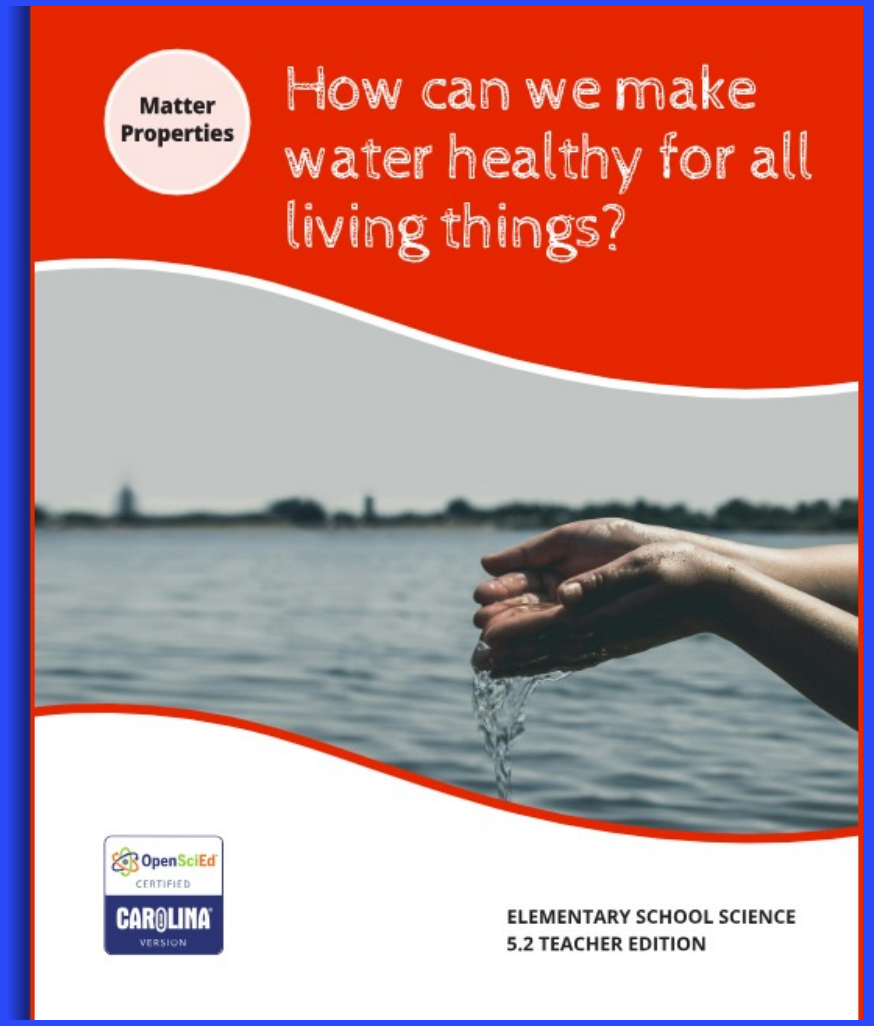
- Water Sample Kit
- Pre-measured amounts
- 1-minute prep time

✓ Fewer materials
✓ Cuts prep time
✓ Better storage option

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Grade 5

5.2 How can we make water healthy for all living things?



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Connect to Our Experiences

Floods Prompt Warnings About Contaminated River Water

Officials Recommend Boiling Water Before Drinking It Until Tests Can be Ordered

Residents Warned to Not Let Their Pets Drink the Water in Area Pond

Beaches Closed Another Day Due to the Presence of Harmful Bacteria

Strange Smell Reported in the Area After Rainfall

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Make Observations

Work with a small group to sort pictures of water as healthy or unhealthy.



Sulfur by CC BY SA 3.0



Francesco Ungaro



Elycefelize by CC BY 2.0



KoolShooters



Daria Klet

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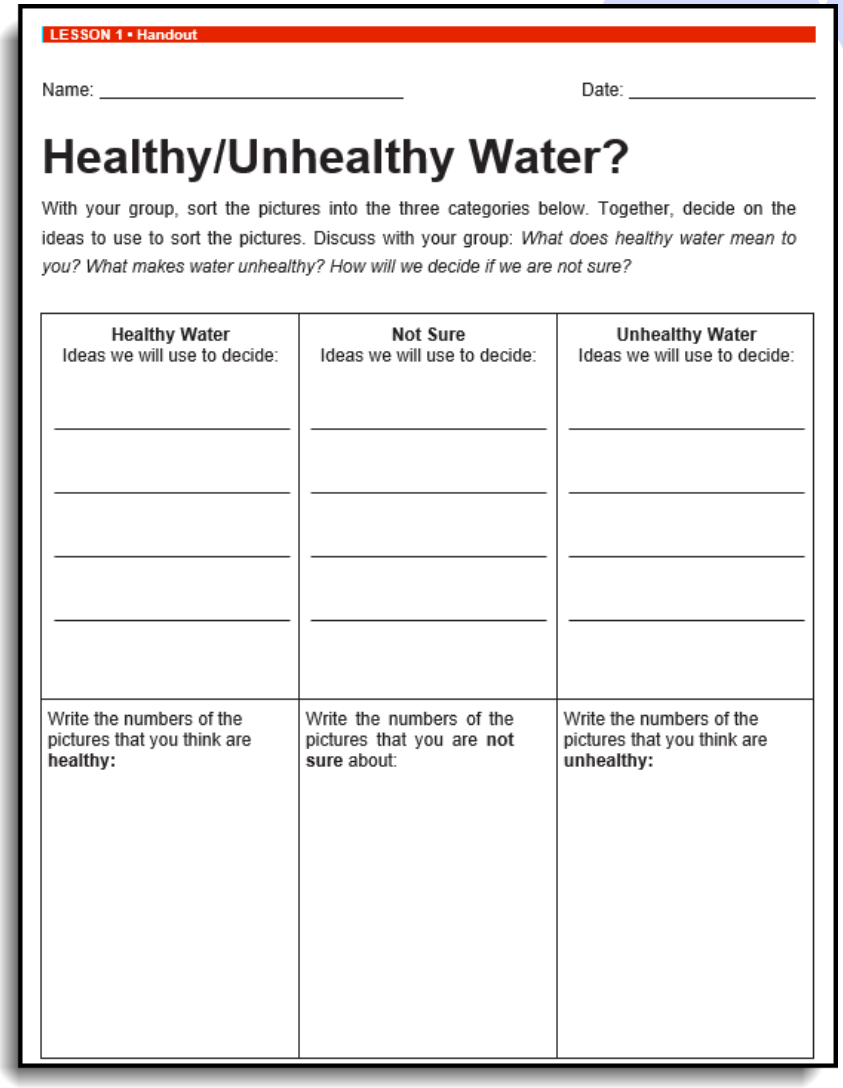
Make Observations



Work with a small group to sort pictures of water as healthy or unhealthy.

Be ready to share:

- How you decided if the water was healthy, unhealthy, or you're not sure.
- What other evidence would you like to have to help you decide?
- How could you get that evidence?



LESSON 1 • Handout

Name: _____ Date: _____

Healthy/Unhealthy Water?

With your group, sort the pictures into the three categories below. Together, decide on the ideas to use to sort the pictures. Discuss with your group: *What does healthy water mean to you? What makes water unhealthy? How will we decide if we are not sure?*

Healthy Water Ideas we will use to decide:	**Not Sure** Ideas we will use to decide:	**Unhealthy Water** Ideas we will use to decide:
Write the numbers of the pictures that you think are **healthy:**	Write the numbers of the pictures that you are **not sure** about:	Write the numbers of the pictures that you think are **unhealthy:**

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Compare Our Ideas

Let's tally up our different ideas about the health of the water in each picture.

What other evidence would help us decide on the health of the water?

Health of the Water

	Healthy	Not Sure	Unhealthy
1			
2			
3			
4			
5			

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Make Observations

Take a closer look at the water samples and discuss initial ideas.

- For whom or for what would each water sample be healthy or unhealthy?
- Which sample does your group think is the least healthy? The most healthy?
- How could the unhealthy water become healthy again?



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Develop an Initial Model

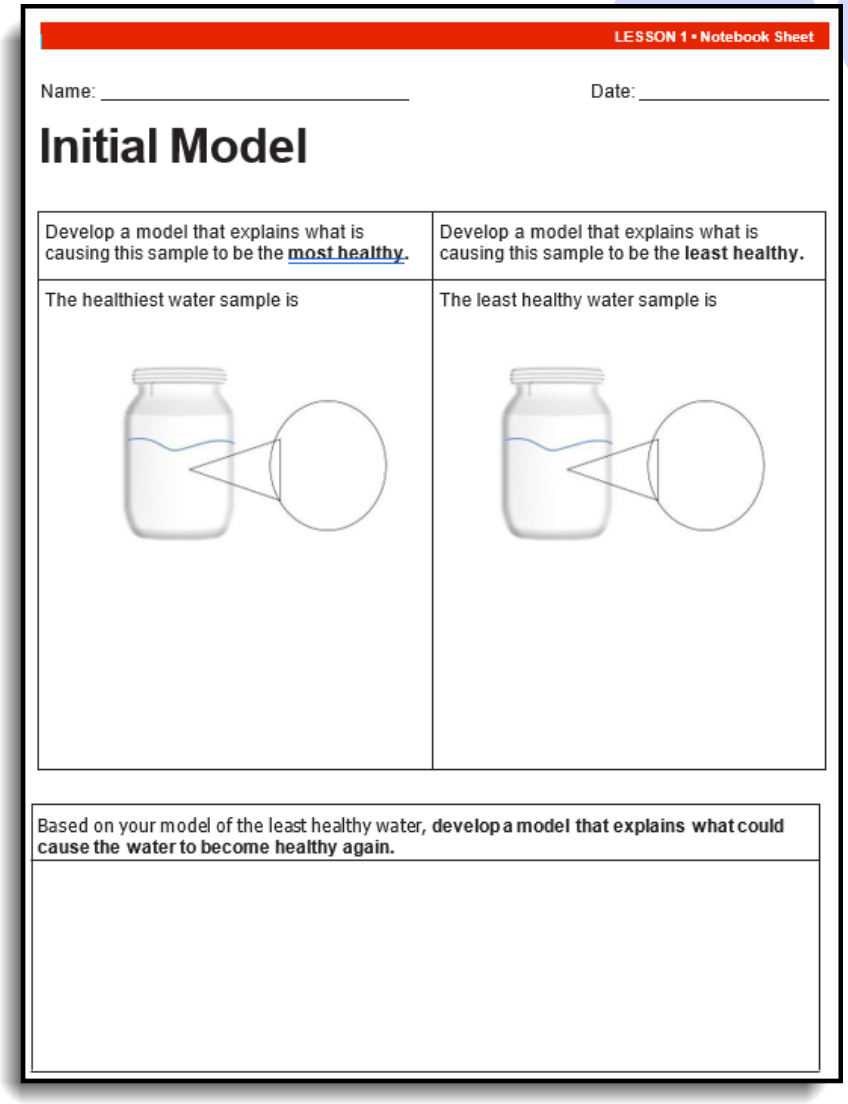
Develop a model to explain:

What is causing the water sample to be the **healthiest**?

What is causing the water sample to be the **least healthy**?

For the least healthy water:

- What could cause the water to become healthy again?



LESSON 1 • Notebook Sheet

Name: _____ Date: _____

Initial Model

Develop a model that explains what is causing this sample to be the **most healthy**.	Develop a model that explains what is causing this sample to be the **least healthy.**
The healthiest water sample is	The least healthy water sample is

Based on your model of the least healthy water, **develop a model that explains what could cause the water to become healthy again.**

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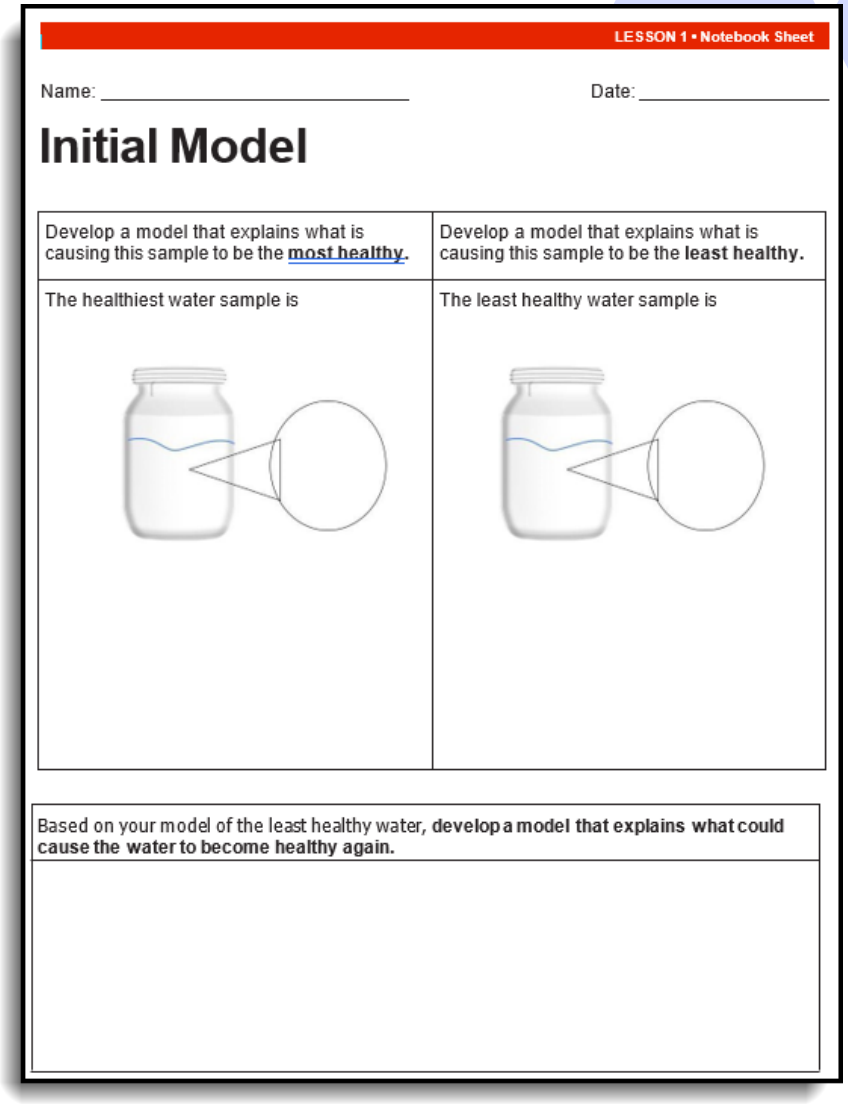
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Share Models

Show and tell a partner about your model.

Listen and observe while they tell you about theirs.

Identify at least two ways your models are the same, and at least two ways they are different.



LESSON 1 • Notebook Sheet

Name: _____ Date: _____

Initial Model

Develop a model that explains what is causing this sample to be the **most healthy**.	Develop a model that explains what is causing this sample to be the **least healthy.**
The healthiest water sample is	The least healthy water sample is

Based on your model of the least healthy water, **develop a model that explains what could cause the water to become healthy again.**

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Carry Out an Investigation

What more do we want to know about the water samples?

How could we further investigate the water samples?



Lake Water | **Pool Water** | **Metallic Water** | **Rain Water** | **Drinking Water**

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Participate in a Discussion



Based on the properties that were observed and measured, can we confirm any of the materials we thought might be in our water samples?

Healthy/Unhealthy Water Chart

Water Sample Materials

Water Samples	We think it might be....	We have evidence that it is...	In what ways is it healthy?	In what ways is it unhealthy?	How did we make this water sample healthier?
#1 Lake Water					
#2 Pool Water					
#3 Metallic Water					
#4 Rain Water					
#5 Drinking Water					

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Connect to Our Experiences



Talk with one partner.

When have you…

- removed materials from water?
- observed materials removed from water by others or in nature?

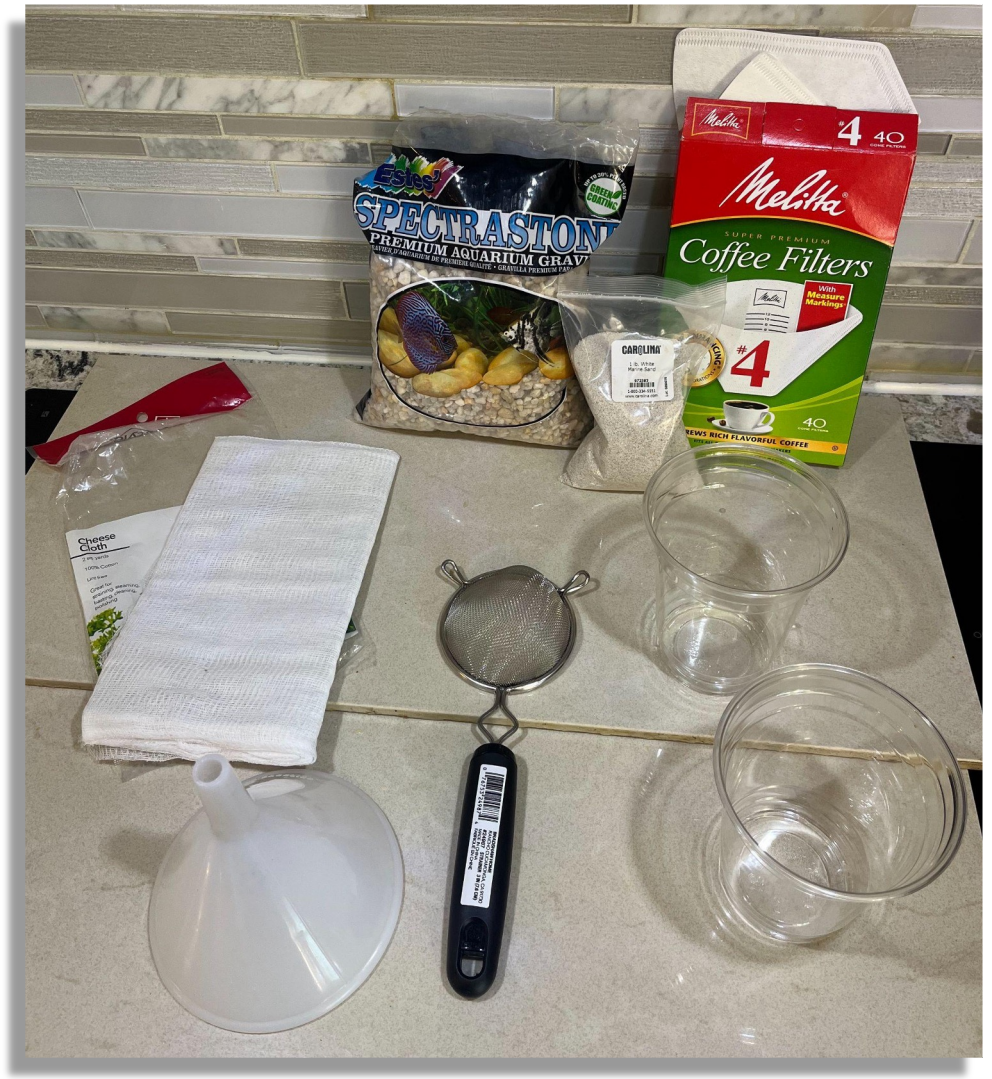
Discuss your ideas with another partner group. How are your ideas the same or different?

How can we remove materials that we can see from the water samples?

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Consider Supplies

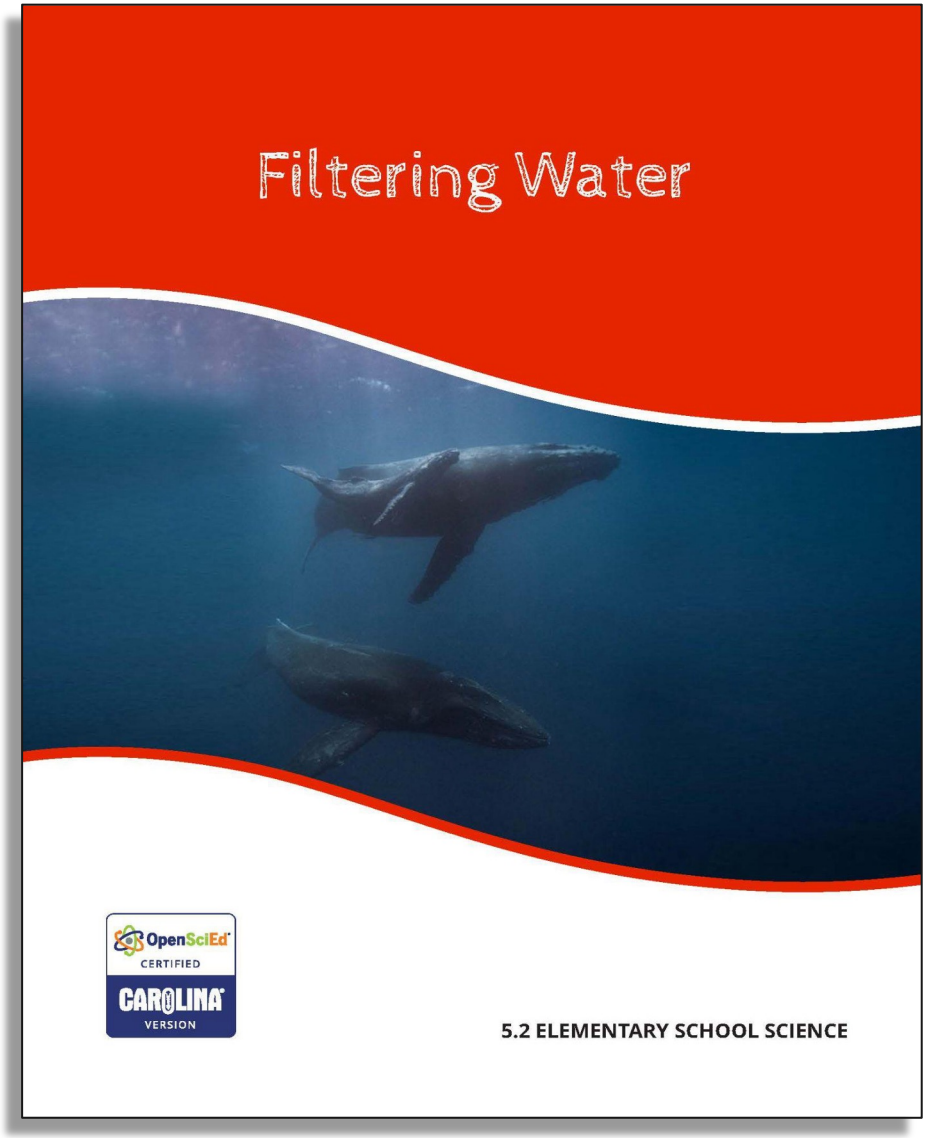
How might we use available supplies to filter our water samples?



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Read a Book

Let’s learn more about filter design to figure out what will work best for our water samples.



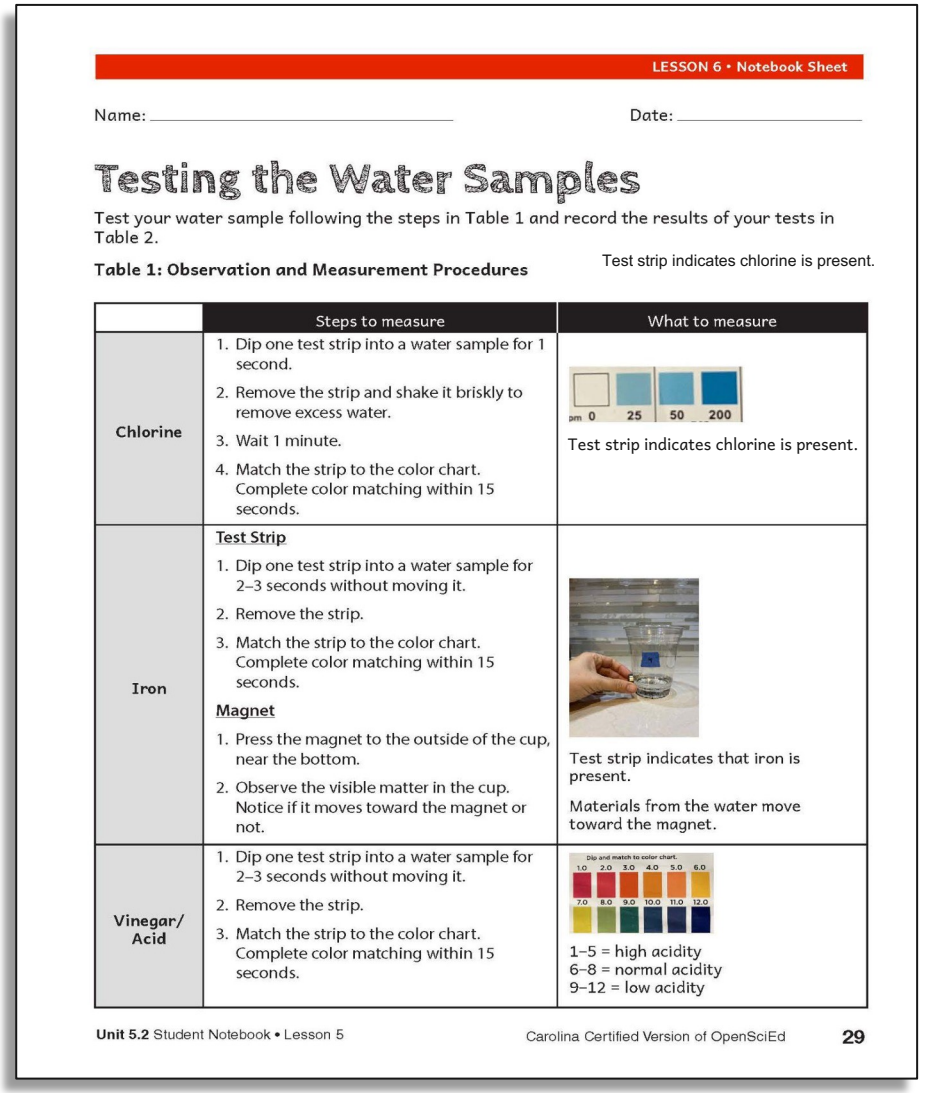
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Carry Out an Investigation

Let's review the procedure for testing the water samples!



LESSON 6 • Notebook Sheet

Name: _____ Date: _____

Testing the Water Samples

Test your water sample following the steps in Table 1 and record the results of your tests in Table 2.

Table 1: Observation and Measurement Procedures

	Steps to measure	What to measure
Chlorine	1. Dip one test strip into a water sample for 1 second. 2. Remove the strip and shake it briskly to remove excess water. 3. Wait 1 minute. 4. Match the strip to the color chart. Complete color matching within 15 seconds.	 Test strip indicates chlorine is present.
Iron	**Test Strip** 1. Dip one test strip into a water sample for 2–3 seconds without moving it. 2. Remove the strip. 3. Match the strip to the color chart. Complete color matching within 15 seconds. **Magnet** 1. Press the magnet to the outside of the cup, near the bottom. 2. Observe the visible matter in the cup. Notice if it moves toward the magnet or not.	 Test strip indicates that iron is present. Materials from the water move toward the magnet.
Vinegar/ Acid	1. Dip one test strip into a water sample for 2–3 seconds without moving it. 2. Remove the strip. 3. Match the strip to the color chart. Complete color matching within 15 seconds.	 1–5 = high acidity 6–8 = normal acidity 9–12 = low acidity

Test strip indicates chlorine is present.

Unit 5.2 Student Notebook • Lesson 5 Carolina Certified Version of OpenSciEd **29**

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Carry Out an Investigation



Use Table 2 to record which types of matter were detected in the water samples.

LESSON 6 • Notebook Sheet

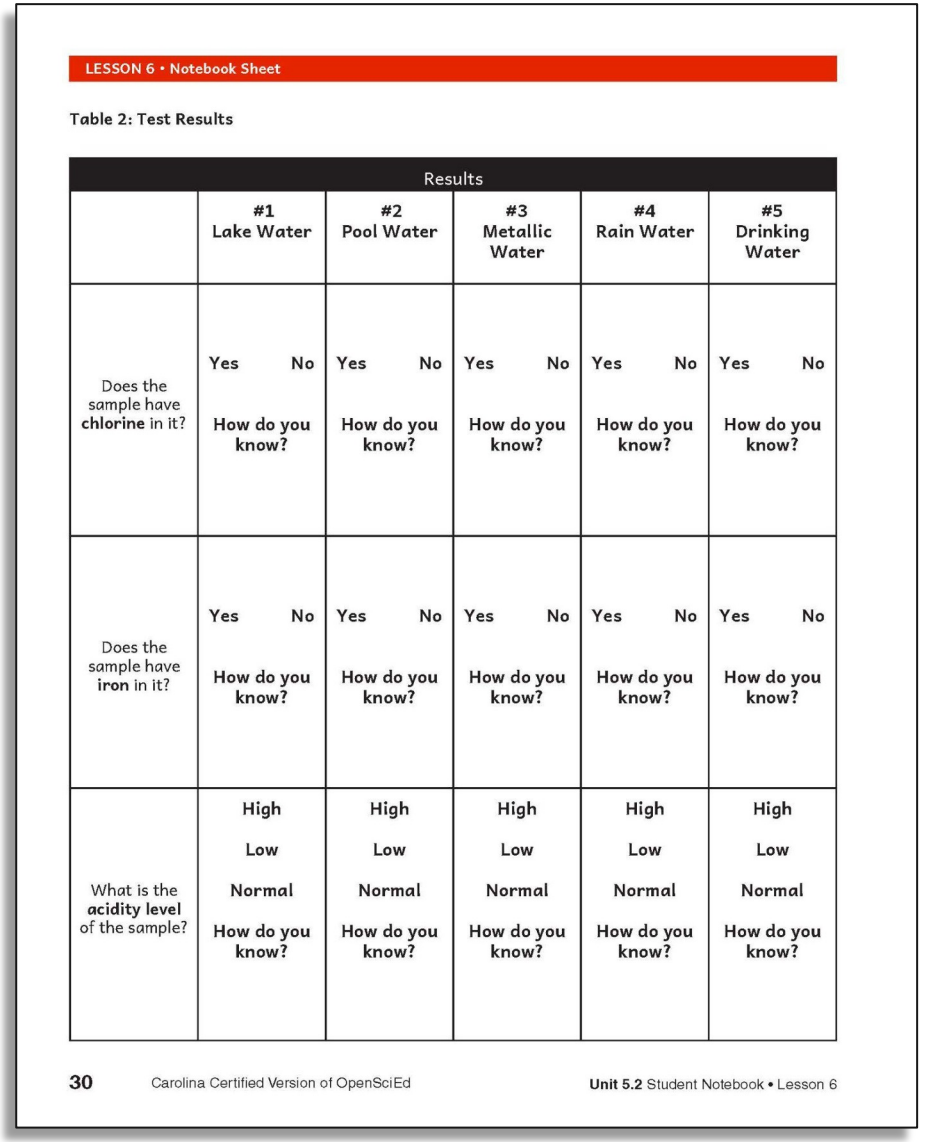
Table 2: Test Results

	Results				
	#1 Lake Water	#2 Pool Water	#3 Metallic Water	#4 Rain Water	#5 Drinking Water
Does the sample have **chlorine** in it?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?
Does the sample have **iron** in it?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?
What is the **acidity level** of the sample?	High Low Normal How do you know?	High Low Normal How do you know?	High Low Normal How do you know?	High Low Normal How do you know?	High Low Normal How do you know?

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Carry Out an Investigation

What types of matter do we now have evidence to support are in the water samples?



LESSON 6 • Notebook Sheet

Table 2: Test Results

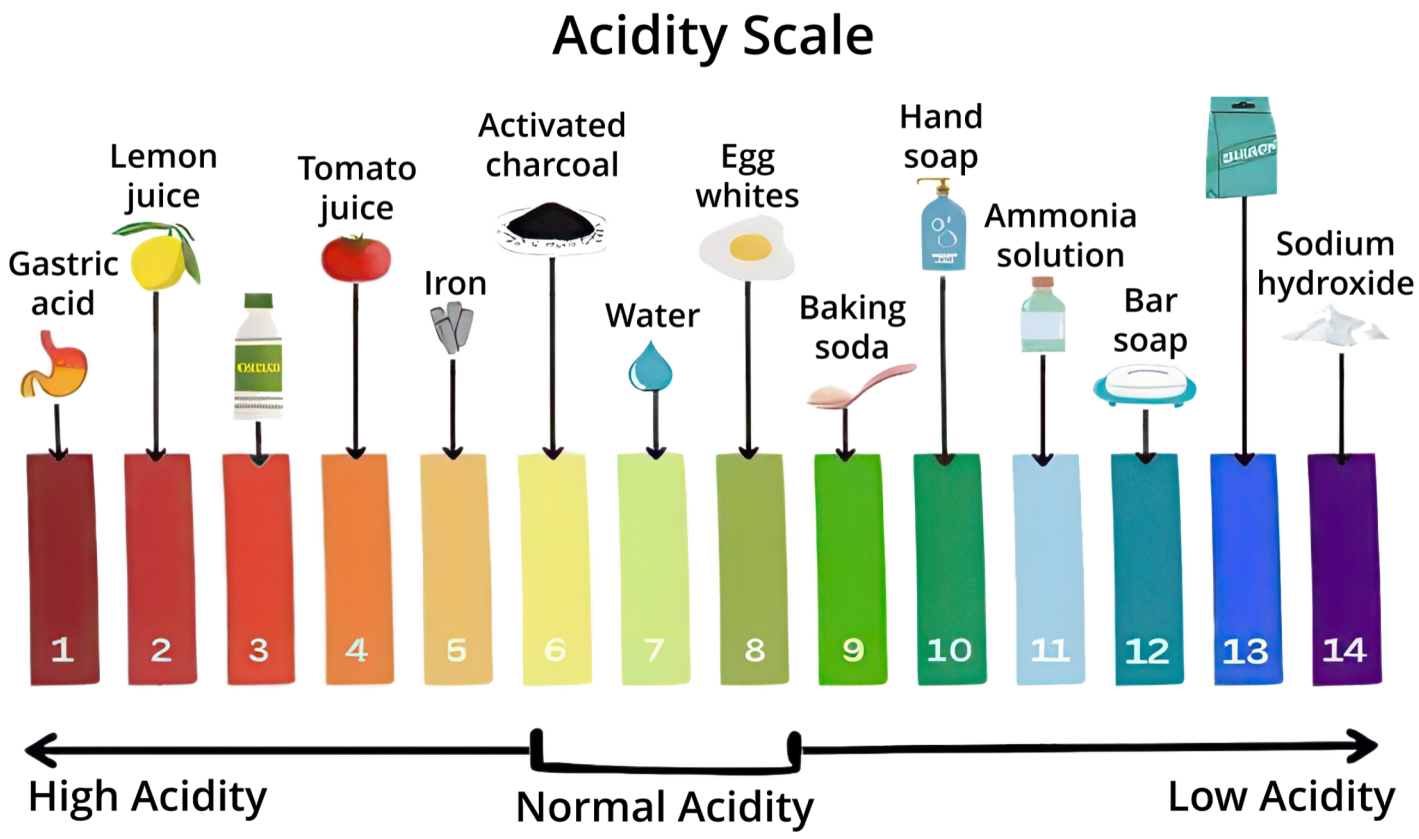
	Results				
	#1 Lake Water	#2 Pool Water	#3 Metallic Water	#4 Rain Water	#5 Drinking Water
Does the sample have **chlorine** in it?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?
Does the sample have **iron** in it?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?	Yes No How do you know?
What is the **acidity level** of the sample?	High Low Normal How do you know?	High Low Normal How do you know?	High Low Normal How do you know?	High Low Normal How do you know?	High Low Normal How do you know?

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Make Sense of Data

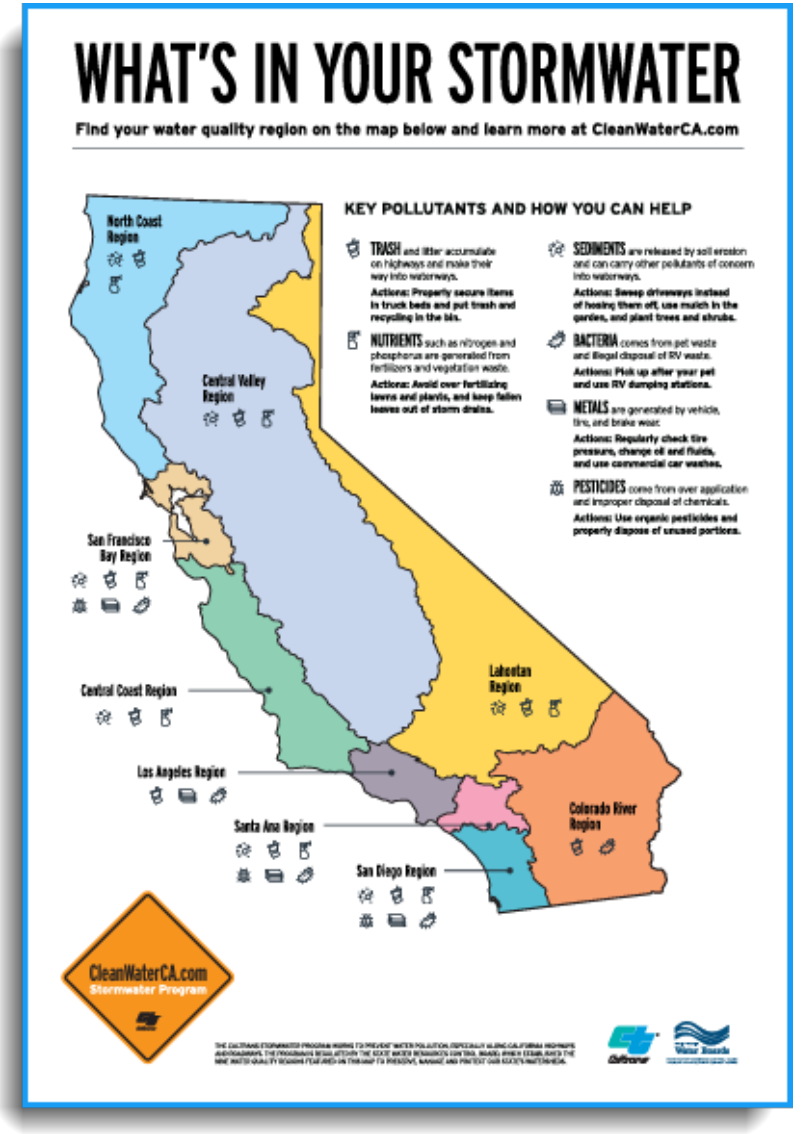
What do you notice about this acidity scale that can help you figure out what types of matter might be in our water samples?



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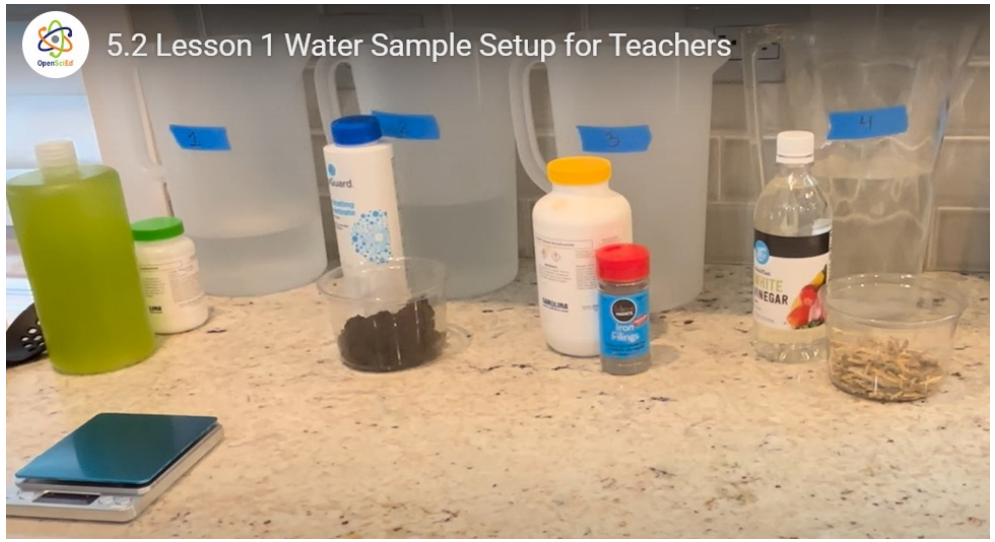
Connect to Our Communities

When have you heard about people testing water in your community for unhealthy things?



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5.2 Matter Properties



- Requires teachers to prepare exact measurements
- Teacher prep ~20 minutes per group (2.5-3 hours total)

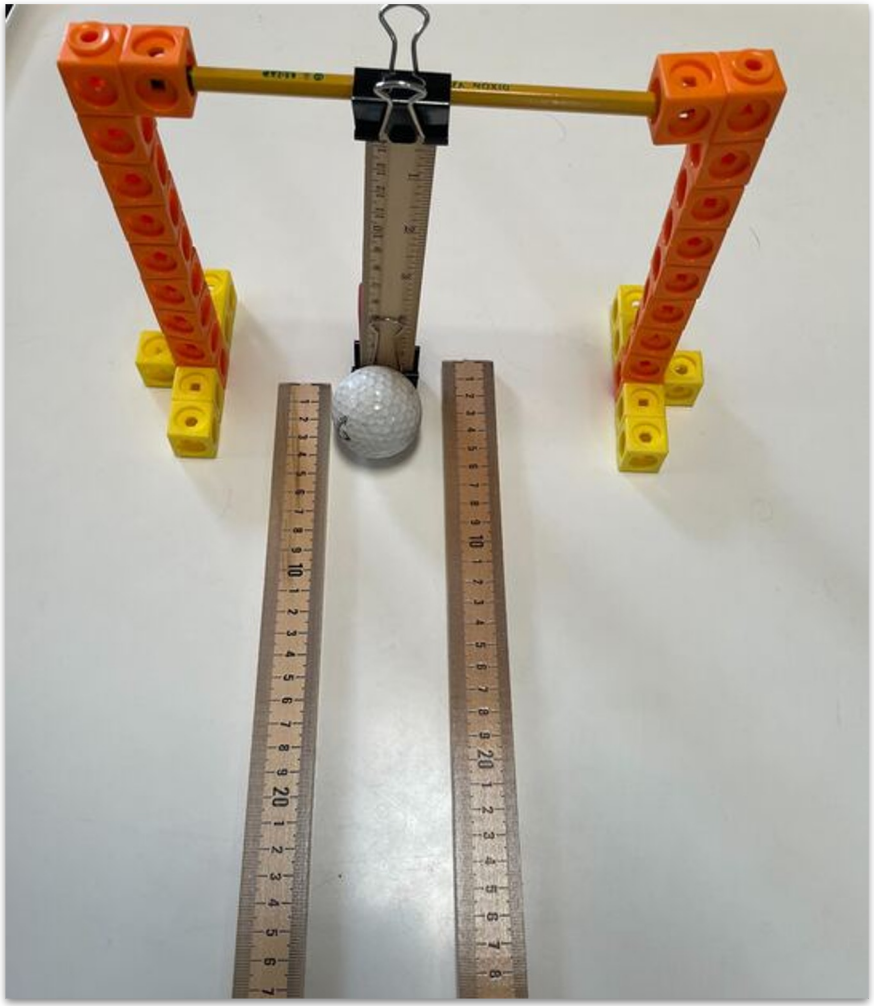


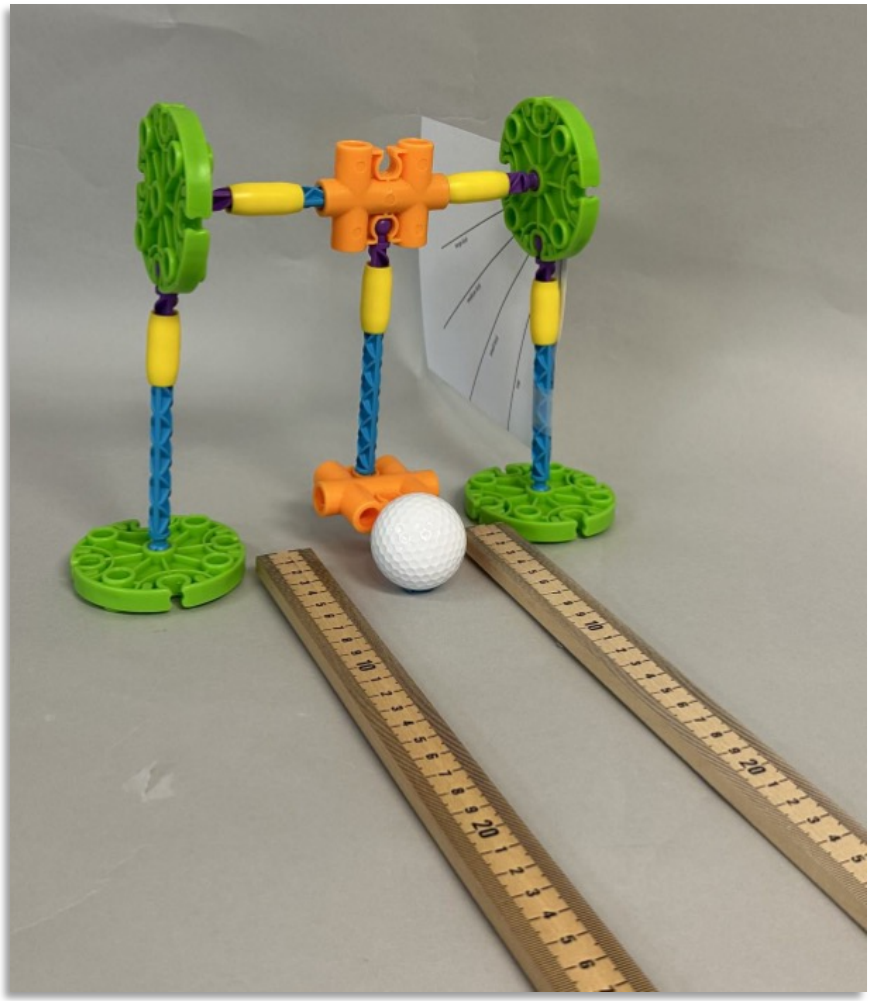
- Water Sample Kit
- Pre-measured amounts
- 1-minute prep time

✓ Fewer materials
✓ Cuts prep time
✓ Better storage option

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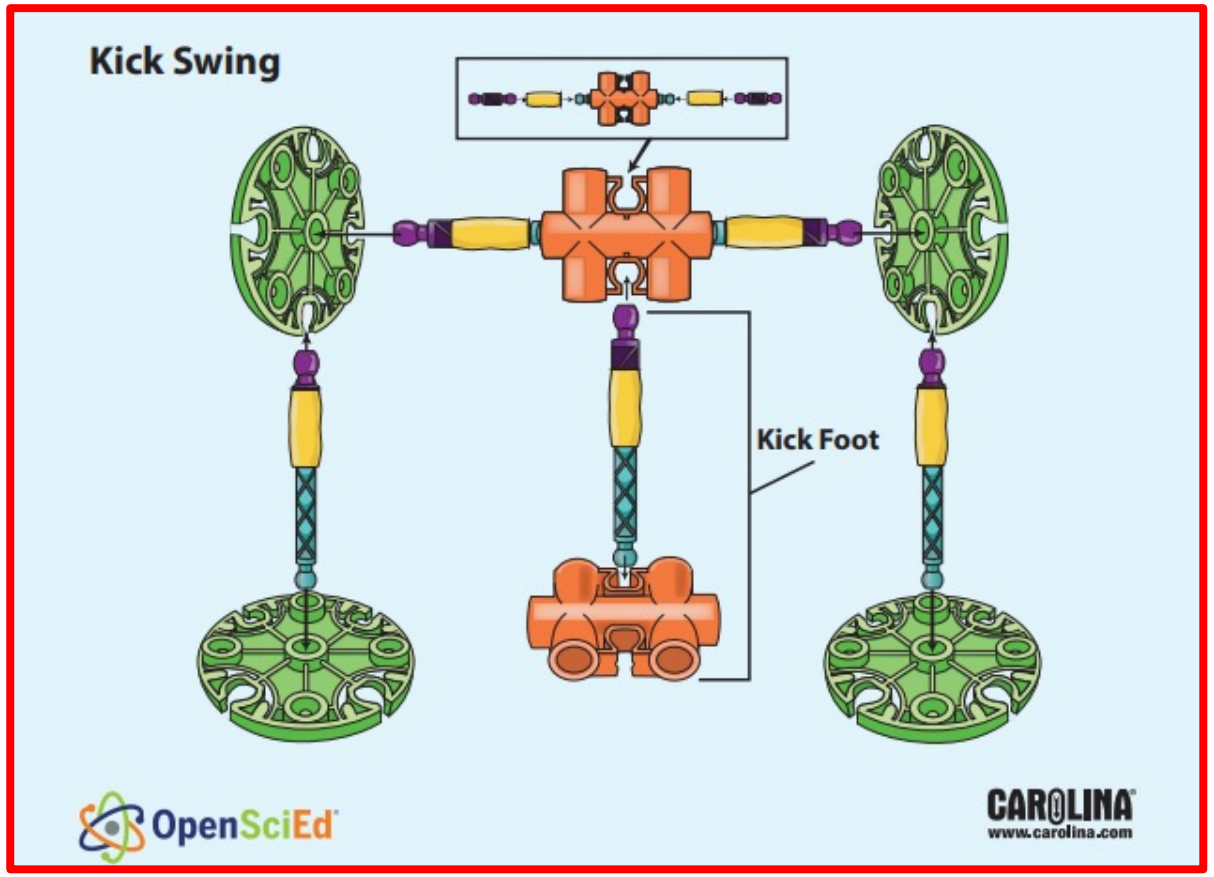
4.1 Energy Transfer: Collisions

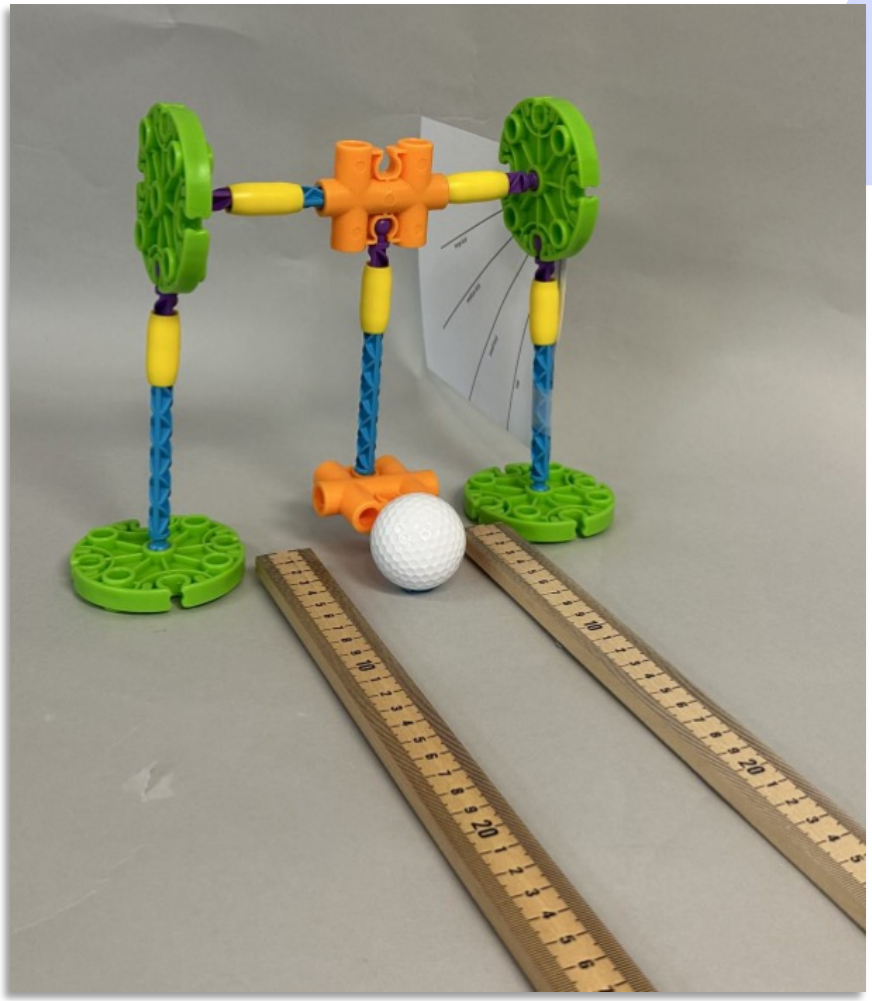




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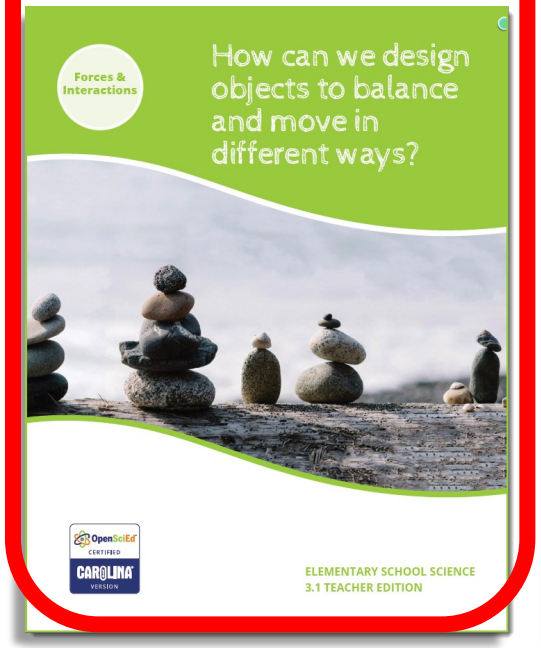
4.1 Energy Transfer: Collisions



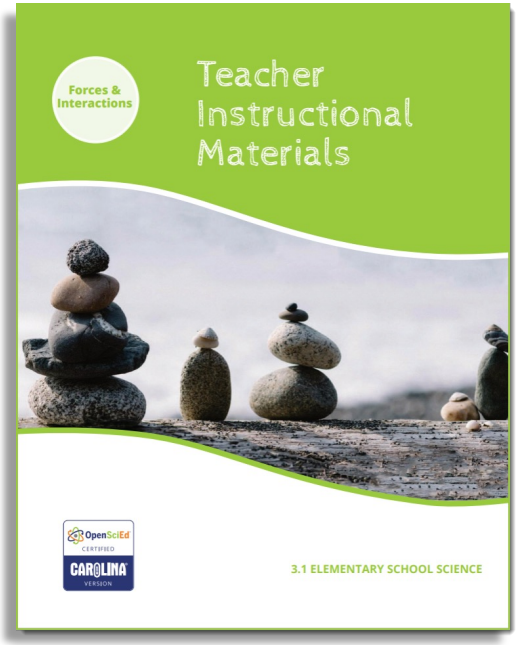


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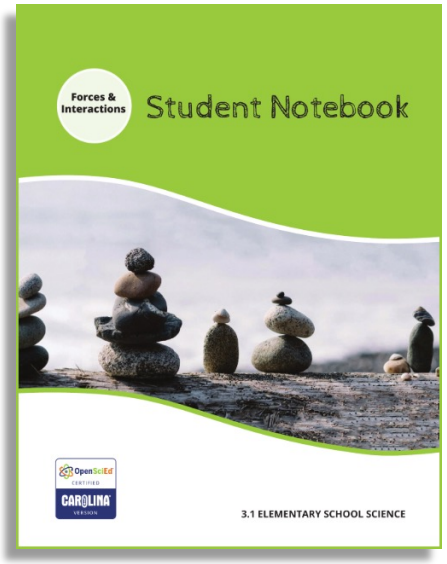
Teacher Edition



Teacher Instructional Manual



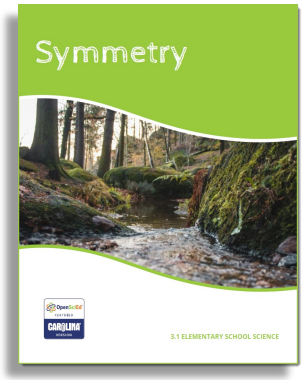
Student Notebook

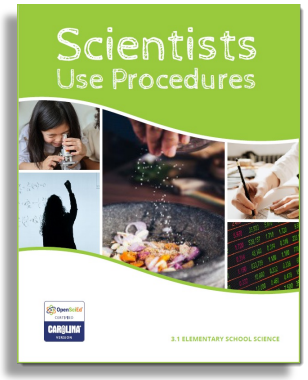


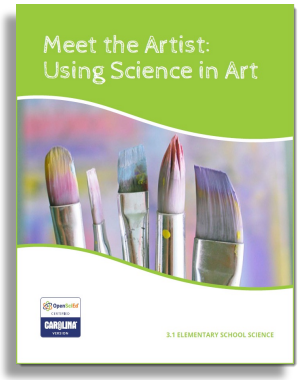
Science Kits

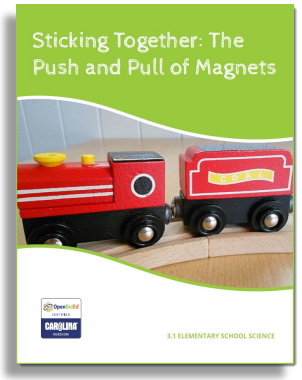


Student Readers

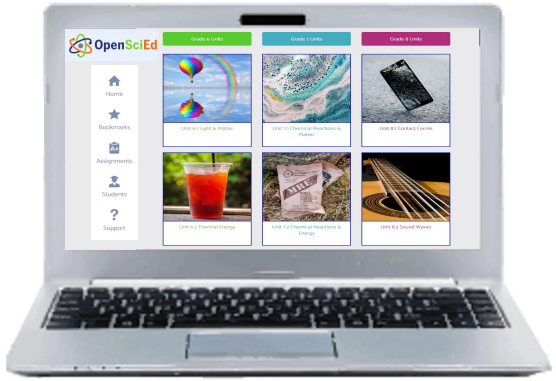








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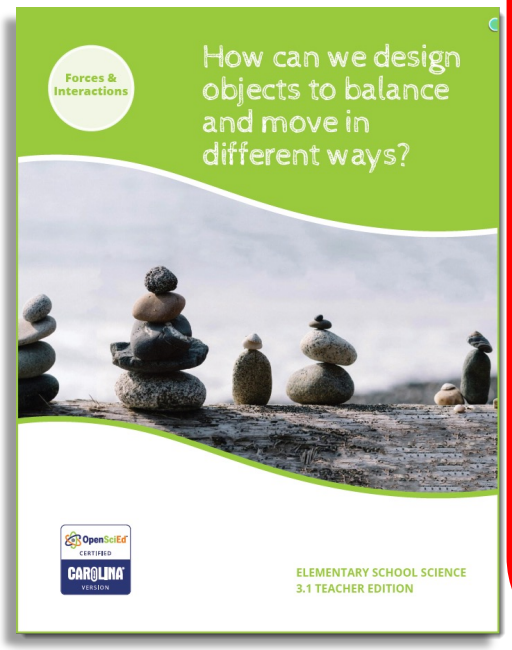


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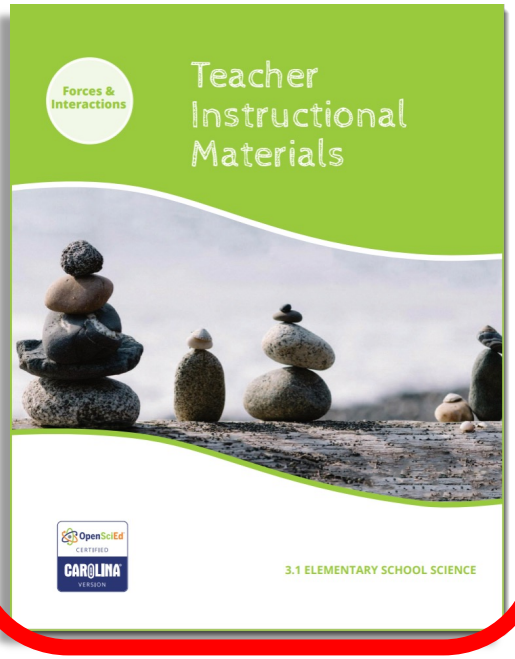
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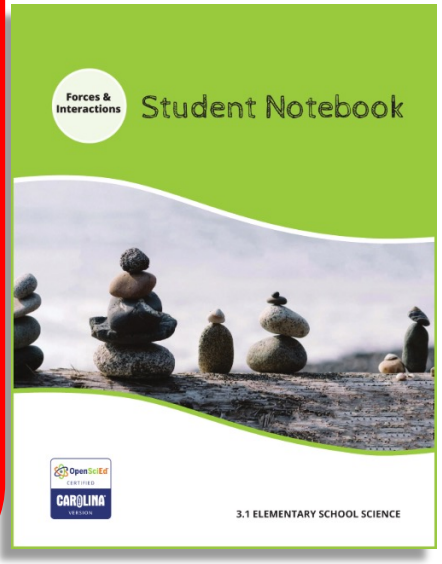
Teacher Edition



Teacher Instructional Manual



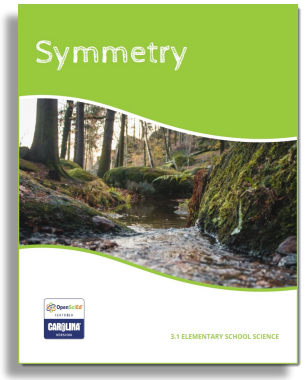
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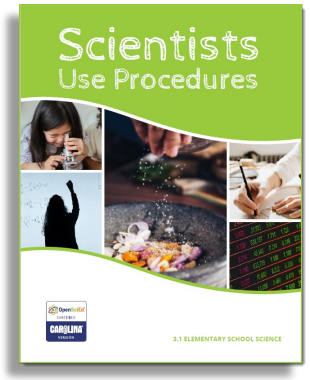


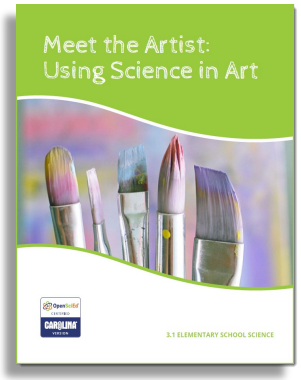
Science Kits

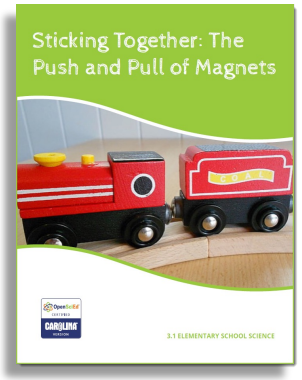


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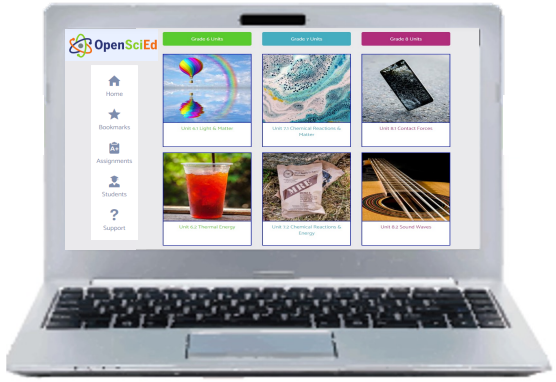








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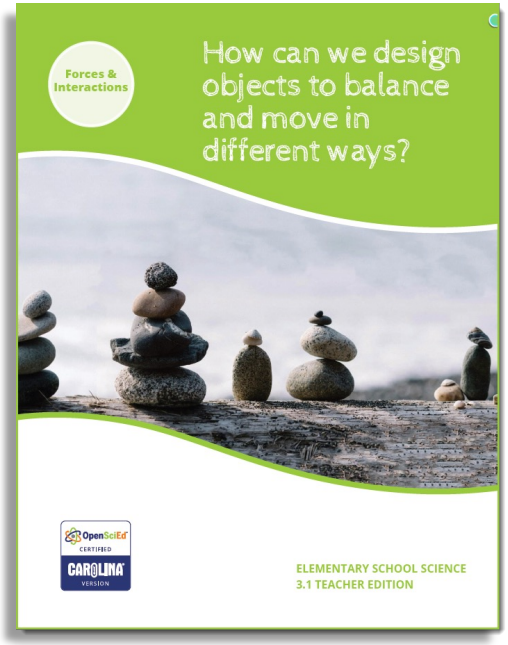


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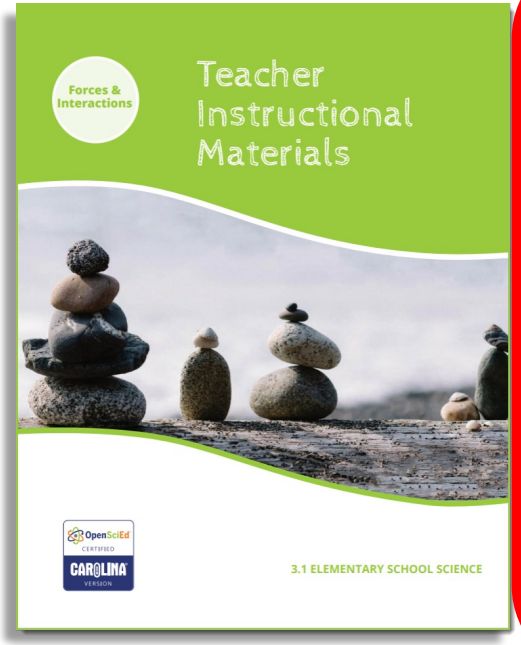
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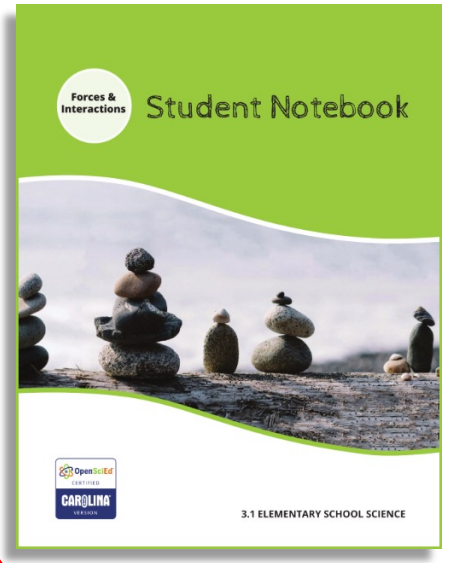
Teacher Edition



Teacher Instructional Manual



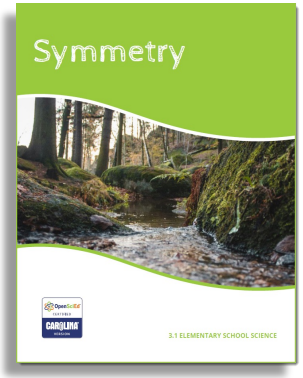
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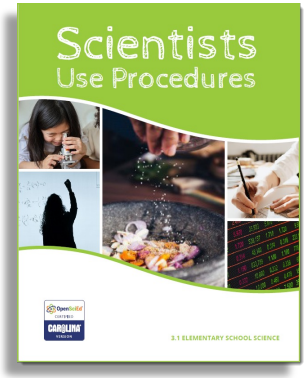


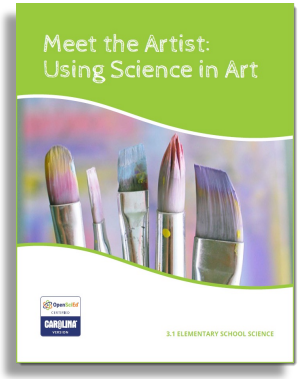
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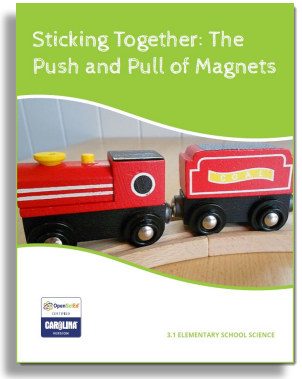


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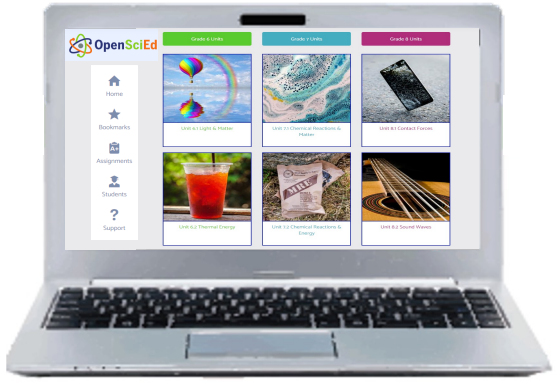








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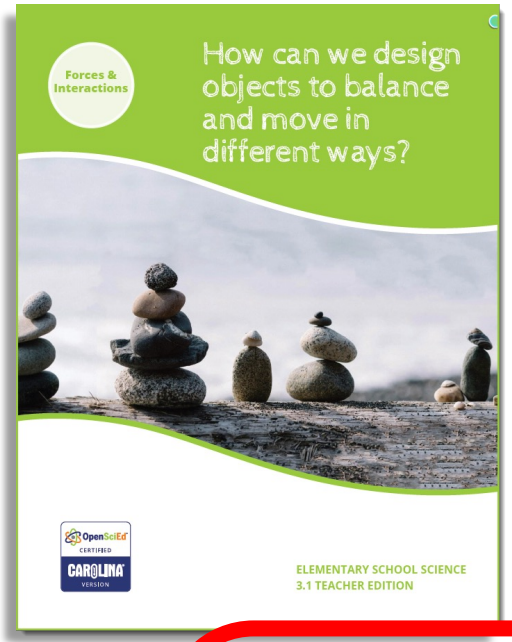


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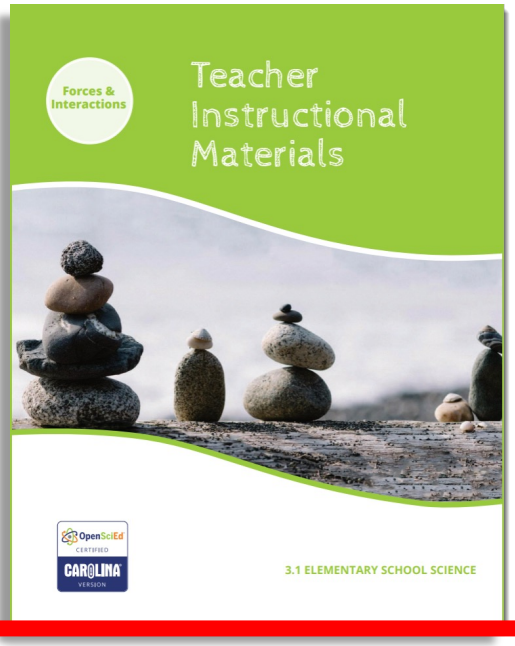
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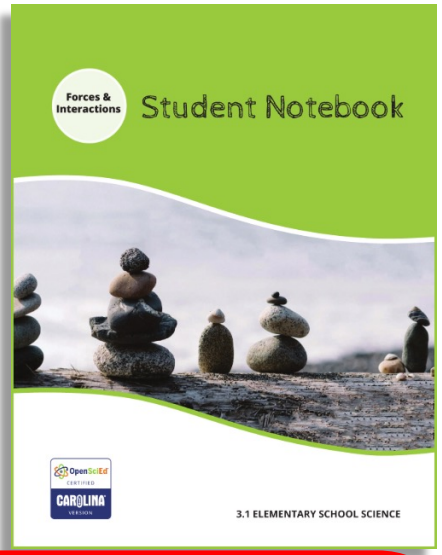
Teacher Edition



Teacher Instructional Manual



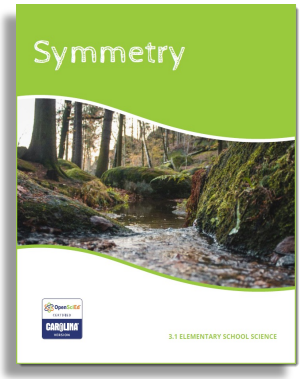
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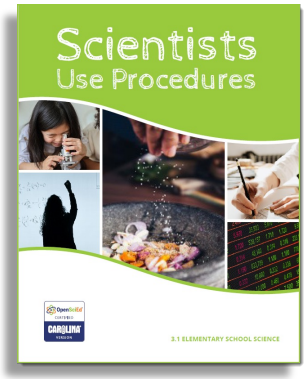


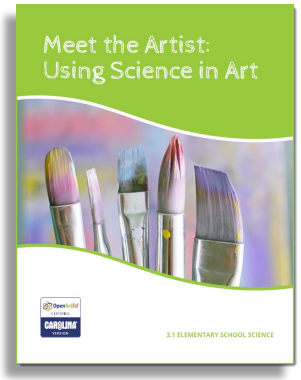
Science Kits

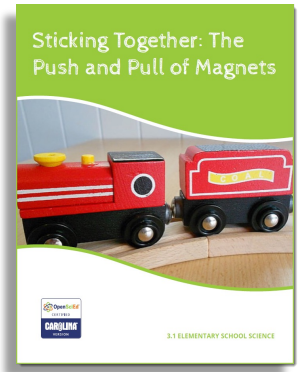


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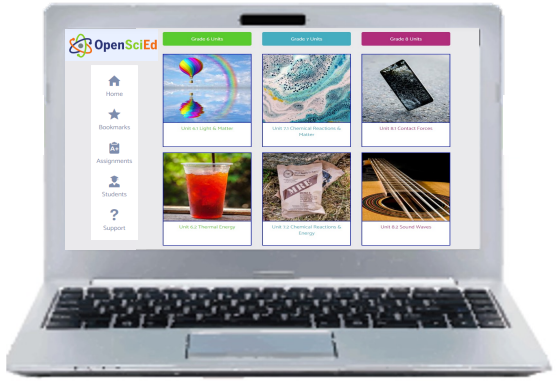








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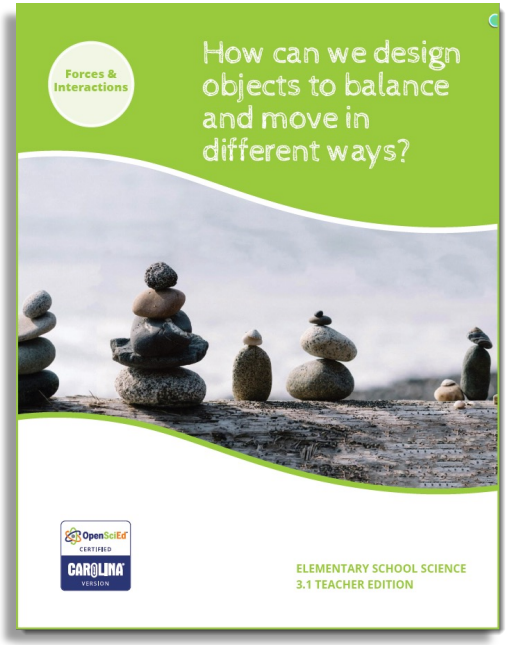


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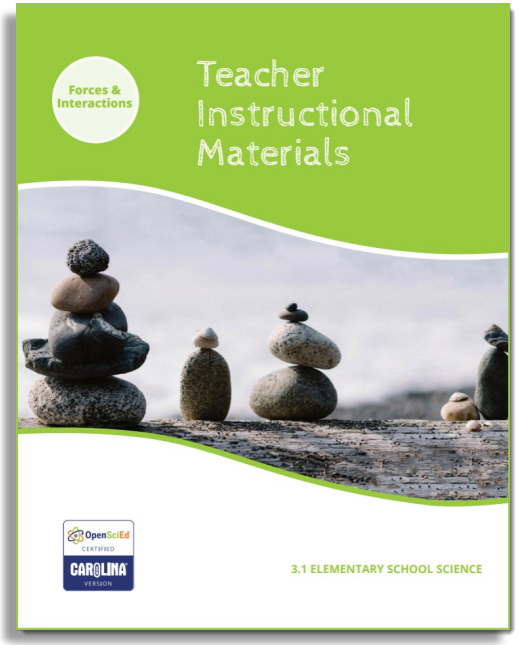
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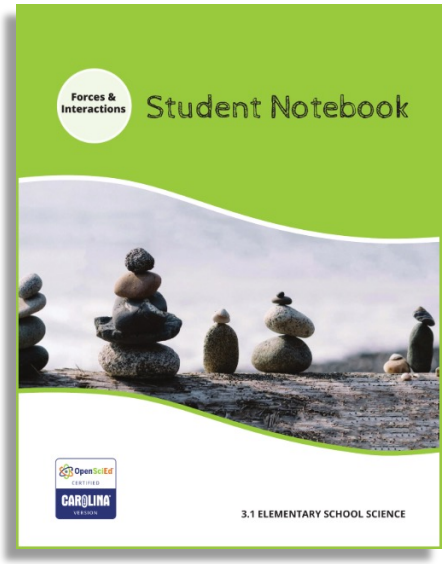
Teacher Edition



Teacher Instructional Manual



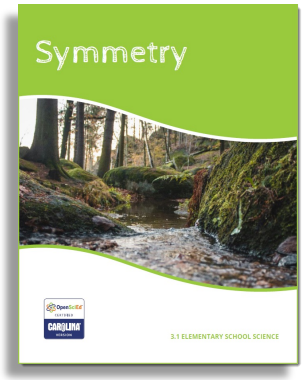
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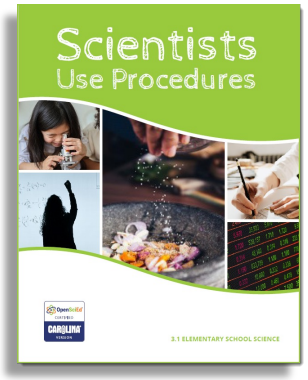


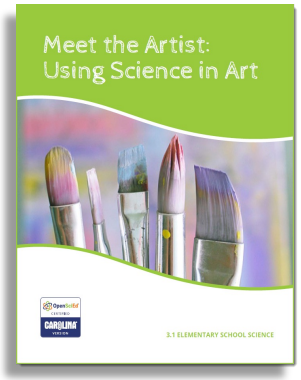
Science Kits

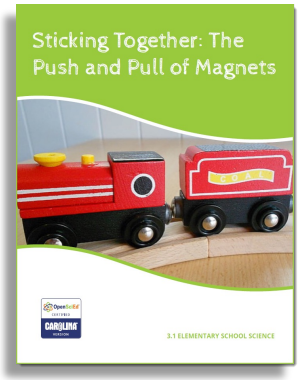


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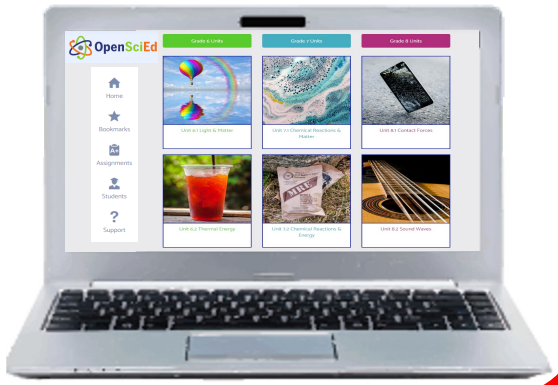








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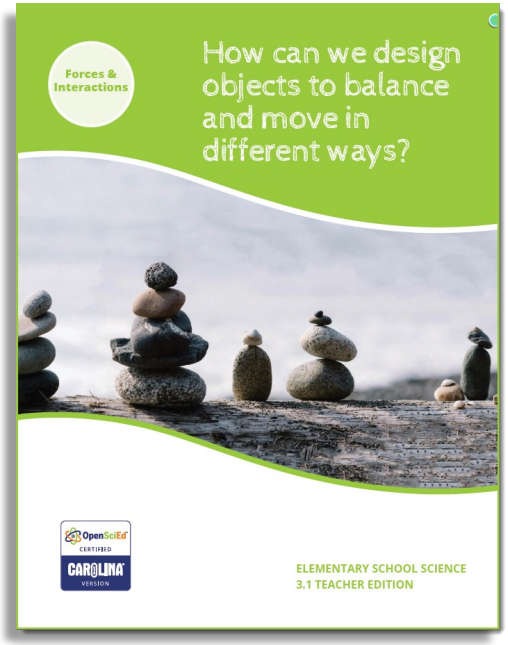


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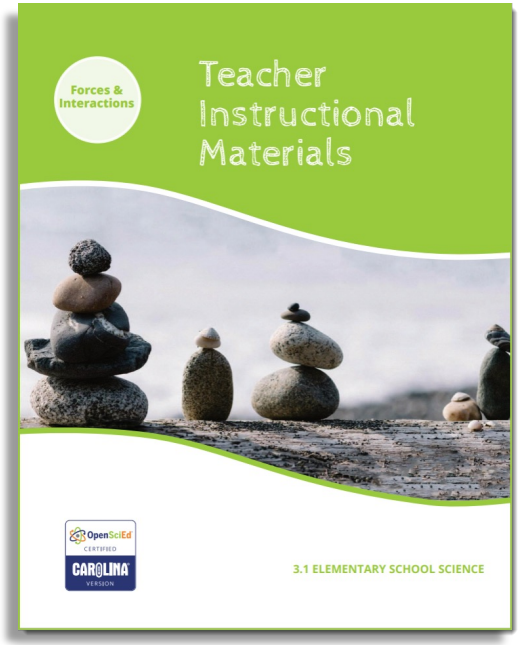
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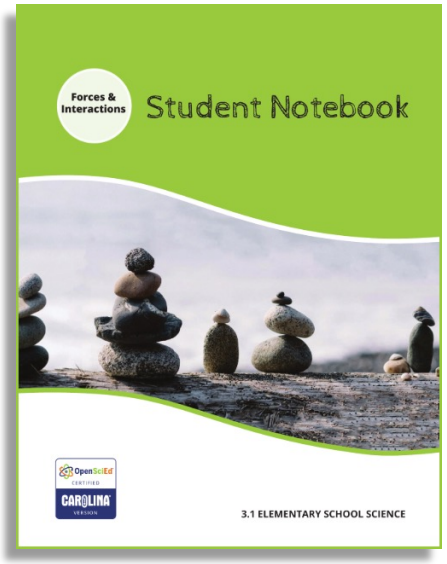
Teacher Edition



Teacher Instructional Manual



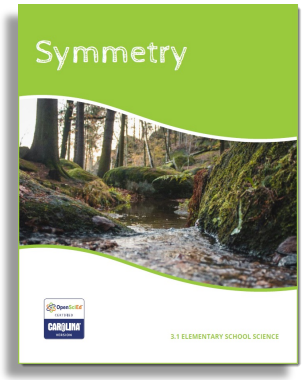
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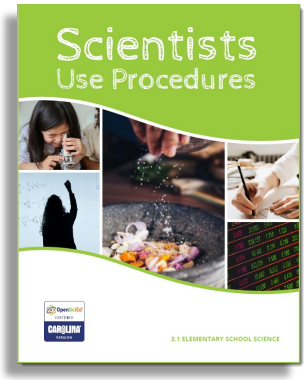


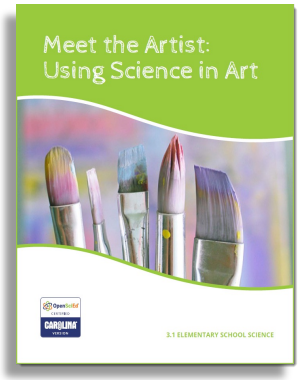
Science Kits

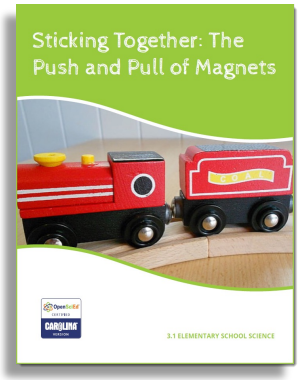


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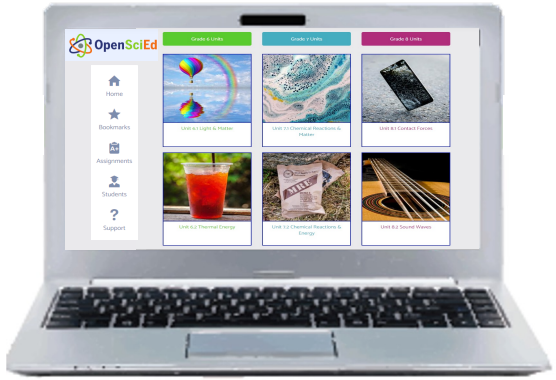








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Enhanced Kits and Materials

Equipment Kits

- Kits include all **consumable and non-consumable** materials for **8 lab groups** per class to allow for maximum student participation
- Kits are available in a **1-class** configuration for up to 32 students
- Kits are easily refurbished with 1-class refurbishment sets
  - Prepaid vouchers are available for future refurbishments



Kits are packed and shipped in durable, stackable totes and cardboard boxes.

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Instructional Elements

Phenomena-Based

Centered around figuring out phenomena or solving problems

Coherent for Students

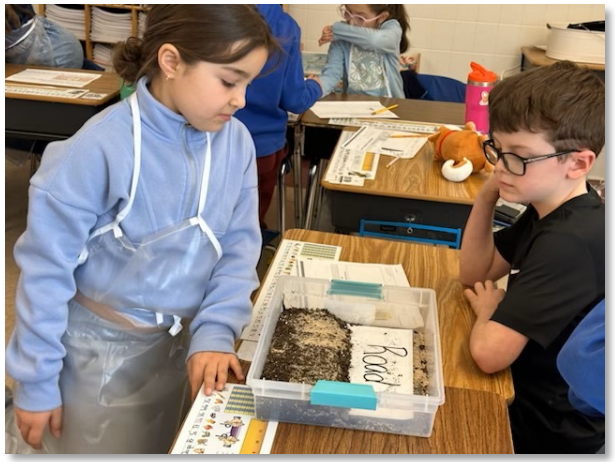
Driven by students' questions and ideas

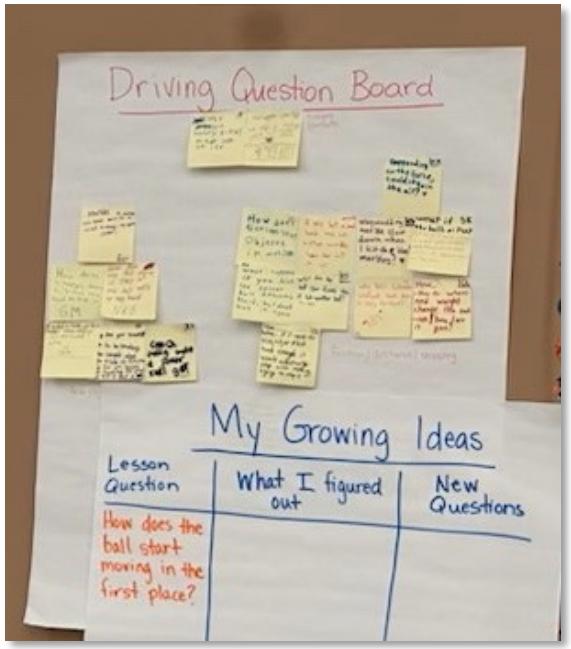
Driven by Evidence

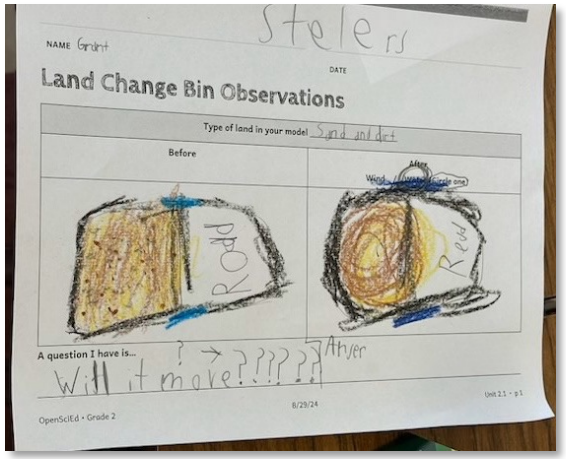
Incremental building and revision of ideas based on evidence

Collaborative

WE figure out ideas together









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