

STEAM

Reading

Elementary

Science

Technology

Engineering

Arts

Math

1

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1

2

3

4

5



KEY WORDS

A Look, listen, and repeat. 07



n. mirror



n. dentist



adj. same



v. raise



n. ambulance



n. driver

B Listen and number the words. 08

16

I will learn... about the way things look in a mirror.

MIRROR VISION



WARM-UP

When you look in a mirror, where is your right hand and where is your left hand?



READING

Listen and read. 09

We use **mirrors** every day. We use them to check our hair. A **dentist** uses them to look at our teeth. What do you look like in the mirror? Do you look the **same**?

Let's prepare a mirror and a penguin doll.



Raise the left wing of the penguin doll and look at the doll in the mirror.

1 STEAM

Units are grouped together in pairs. Each pair of units has lessons on the same subject. Every unit focuses on one or more aspects of STEAM (Science, Technology, Engineering, Arts, Math).

2 I WILL LEARN...

The academic objective of the unit is introduced to get students thinking.

3 QR CODES

Scan the audio QR CODE to listen to the key words and reading passages. In the experiment units, scan the video QR CODE to watch a video of a real experiment.

Video Experiments

Live-action videos take students step-by-step through all science experiments. This visual aid enhances their learning experience and makes the topic come alive.



STEP
2



Raise the right wing of the penguin doll and look at the doll in the mirror.

The color of the doll in the mirror is the same as the real one.

The top and bottom are the same, too. But the left and right sides are the wrong way around.

The writing on the front of an ambulance is backward.

When a driver sees it in the car mirror, it's the right way around.



WOW! I SEE!

In reality, mirrors don't change left to right, as they don't change up to down. They only reflect* the image facing them.

Go to page 113 for the meaning of difficult words (*).

C Circle the key words in the reading.

D Read and choose.

1. What does same mean in the reading?
a. mirror b. different c. equal
2. Which is the opposite of raise?
a. move up b. lower c. lift

17

6

7

8

4 KEY WORDS

Every unit introduces new KEY WORDS that are necessary to understand the unit's topic. All key words are found in the READING and are illustrated with a photograph.

5 READING

Each READING is an introduction to the topic of the unit. The first unit in a pair introduces the subject through an experiment. The experiment is illustrated and easy to follow. The second unit features an engaging short story on the same topic.

6 WOW! I SEE!

This section goes into further detail on the concepts introduced in the READING.

7 WORDS WITH AN ASTERISK (*)

Difficult words in the unit are marked with an asterisk (*) and are explained in a word list at the back of the book.

8 SHORT ACTIVITIES

Short activities focus attention on the KEY WORDS and check understanding.

CHECK YOUR UNDERSTANDING

This section features a range of activities to check both reading comprehension and understanding of the unit vocabulary.

STEAM PROJECT

The STEAM PROJECT ends the unit with a fun and interactive project that encourages individual creativity as well as collaboration. Project types include experiments, math problems, and arts & crafts. Experimental projects have a video available via QR code. Further explanation for certain projects can be found in the PROJECT REFERENCE at the end of the book.

CHECK YOUR UNDERSTANDING

A Choose the correct answers.

- What is the reading mainly about?
 - It explains what synchronized swimming is.
 - It explains why we can hear sounds in the water.
 - It explains why Julia loved her sister's dancing in the water.
- Sally can hear the music in the water because _____.
 - the water blocks her ears
 - sound can move through water
 - the swimming pool has special speakers
- Which of the following is **NOT** true about Sally's synchronized swimming class?
 - Sally dances in the water.
 - Sally has special speakers.
 - Her class is every Thursday.

B Check true (T) or false (F) for each sentence.

- Julia didn't like Sally's class.
- Sally came out of the water because Julia shouted her name.

C Complete the chart.

Detail 1	Detail 2
Sound can _____ through water.	If Julia _____ Sally's name, Sally will _____ her in the water.

PROJECT HOW SOUNDS MOVE THROUGH LIQUIDS

To do this experiment, you will need:

- 1 big plastic bucket
- Two spoons
- 1 friend

STEP 1 Fill the bucket about halfway with water.

STEP 2 Ask your friend to click one spoon against the other. Listen. Is the sound loud or soft?

STEP 3 Now, ask your friend to click the spoons under the water. Is the sound louder or softer?

STEP 4 Put your ear under the water. Ask your friend to click the spoons under the water. Is the sound louder or softer?

STEP 5 Switch roles with your friend. Repeat this experiment.

STEP 6 Discuss your findings with a friend and choose the correct words.

- When the spoons were not under the water, they made a **loud / soft** sound.
- When the spoons were under the water, they made a **loud / soft** sound.
- When the spoons were under the water, and I put my ear under the water, the sound I heard was **louder / softer**.

PROJECT REFERENCE

10 HOW DO ECHOES WORK?

Do you want to know how echoes work? Follow these steps.

Materials:

- two paper towel tubes
- a pie pan

STEP 1

- Put the pie pan up on a table so it is vertical.
- Place the two paper-towel tubes on the table at an angle with both aimed at the pie pan.
- Ask your friend to put his/her ear to one of the tubes. Then, speak softly into the other tube.

Did your friend hear your voice? How could they hear you even when you spoke into the other tube? Your voice traveled through the tube, hit the pie pan and bounced off, and went back through the tube to your friend's ear. Using the hard surface of a pie pan, you can create and hear echoes.

11 HOW TO SEPARATE MIXTURES

There are more ways to separate mixtures.

Mixture	Way
fresh coffee beans	handpicking
muddy water	a cup and gravity
seawater	water evaporation in the sun
salt and ground pepper	a plastic spoon and a cloth
grains	a winnow

Ground pepper is smaller and lighter than salt. When you rub the spoon on a cloth, it creates static. Pepper easily sticks to the spoon because it is small and light.

Farmers separate grains from husk with a winnow. Since the husk is lighter than the grain, it blows away and only the grains remain while winnowing.

PROJECT REFERENCE

PROJECT REFERENCE pages go into further detail of the concepts behind the project.

WORKBOOK

VOCABULARY PRACTICE

This checks students' understanding of the key words introduced in the Student Book unit.







SENTENCE PRACTICE

This is a sentence match activity featuring sentences taken from the unit reading.

16 GEOLOGISTS STUDY EARTH

VOCABULARY PRACTICE

1. Unscramble the word. Then write it.

1.  socruil	2.  garmlin	3.  duntersdan
4.  stegoglol	5.  tredpic	6.  qarheutak

2. Complete the sentences with the words from the box. One word is not used.

curious earthquake forming predict understand

- Suddenly, everything was shaking. "It's a(n) _____!" said Mom.
- This math problem is too difficult. I can't _____ it. Can you help me?
- "What's in that box?" "Don't be _____," said Dad.
- Geologists can _____ earthquakes because they study rocks and mountains.

SENTENCE PRACTICE

Match the sentences and write.

1. Geologists are very _____.	• they can learn about the past.
2. They try to understand _____.	• is good for farming.
3. By looking at these things, _____.	• our world.
4. They see if the soil is _____.	• look at the past.
5. Geologists don't just _____.	• curious people.

- _____
- _____
- _____
- _____
- _____

SUMMARY

Complete the summary. One word is not used.

curious earthquake forming geologists past planet understand

1. _____ try to 2. _____ our world. They are very 3. _____ people. They study rocks, fossils, and mountains to learn things about the past. They also look at the soil to see if it is good for 4. _____. Sometimes, they also look for oil and gold. They study the present and the past of our planet. Geologists can also say when there might be a(n) 5. _____. They know all about our 6. _____.

SUMMARY

This is a recap of the unit's reading passage. Students are able to check their understanding of the ideas introduced in the unit.

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UNIT / PAGE	STEAM	DETAILS	
1 Page 8	S T E A M	Title	HOW SOUNDS MOVE / WC: 88 ▶
		Academic Objective	Learn about how we hear sounds
		Vocabulary	reach, transfer, siren, matter, waterproof, spot
		STEAM Project	How Sounds Transfer Through Solids ▶ 21st Century Skills: Critical Thinking
2 Page 12	S T E A M	Title	WATER MUSIC / WC: 106
		Academic Objective	Learn about sounds in water
		Vocabulary	synchronized swimming, dance, love, block, answer, shout
		STEAM Project	How Sounds Move Through Liquids ▶ 21st Century Skills: Critical Thinking, Collaboration, Communication
3 Page 16	S T E A M	Title	MIRROR VISION / WC: 100 ▶
		Academic Objective	Learn about the way things look in a mirror
		Vocabulary	mirror, dentist, same, raise, ambulance, driver
		STEAM Project	Reflected Writing 21st Century Skills: Critical Thinking
4 Page 20	S T E A M	Title	WRITING BACKWARD / WC: 109
		Academic Objective	Learn about reading words in a mirror
		Vocabulary	way, speak, mean, read, right, clever
		STEAM Project	Reflected Letters 21st Century Skills: Critical Thinking, Communication
5 Page 24	S T E A M	Title	SEDIMENTARY ROCKS / WC: 90 ▶
		Academic Objective	Learn about how sand becomes a rock
		Vocabulary	finger, sedimentary, model, instead, mixture, minimize
		STEAM Project	Make Candy Sedimentary Rocks ▶ 21st Century Skills: Critical Thinking, Creativity, Communication
6 Page 28	S T E A M	Title	MAKING ROCKS FROM ROCKS / WC: 106
		Academic Objective	Learn more about sedimentary rocks
		Vocabulary	gravel, sediment, mud, press, mass, fossil
		STEAM Project	Sedimentary Rock Formation 21st Century Skills: Critical Thinking, Communication
7 Page 32	S T E A M	Title	FUN FOSSILS / WC: 80 ▶
		Academic Objective	Learn about fossils
		Vocabulary	most, bone, die, shell, clay, firm
		STEAM Project	Find Ten Rock and Fossil Words 21st Century Skills: Critical Thinking, Communication
8 Page 36	S T E A M	Title	TONY AND THE FOSSIL / WC: 106
		Academic Objective	Learn more about fossils
		Vocabulary	field trip, geopark, look for, shellfish, rare, thanks to
		STEAM Project	A Fossil Experience 21st Century Skills: Critical Thinking, Creativity

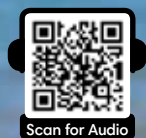
UNIT / PAGE	STEAM	DETAILS	
9 Page 40	S	Title	BOUNCING SOUNDS / WC: 97 ▶
	T	Academic Objective	Learn about how sound reacts to different surfaces
	E	Vocabulary	notice, hard, bounce, material, wooden, absorb
	A	STEAM Project	Make a Balloon Sound Amplifier ▶
M	21st Century Skills: Critical Thinking, Collaboration		
10 Page 44	S	Title	MOUNTAIN ECHO / WC: 103
	T	Academic Objective	Learn what an echo is
	E	Vocabulary	excited, breeze, amazing, worth, difficult, echo
	A	STEAM Project	How Do Echoes Work? ▶
M	21st Century Skills: Critical Thinking, Collaboration, Communication		
11 Page 48	S	Title	SORT WITH SIEVES / WC: 118 ▶
	T	Academic Objective	Learn about sorting things of different sizes
	E	Vocabulary	pure, substance, soybean, separate, sort, sieve
	A	STEAM Project	How to Separate Mixtures
M	21st Century Skills: Critical Thinking		
12 Page 52	S	Title	THE INCREDIBLE BEACH-CLEANING MACHINE / WC: 101
	T	Academic Objective	Learn more about ways we can sort things
	E	Vocabulary	clean up, mess, strange, pick up, waste, take away
	A	STEAM Project	Sort Your Waste
M	21st Century Skills: Critical Thinking, Collaboration, Communication		
13 Page 56	S	Title	DROPS OF WATER / WC: 92 ▶
	T	Academic Objective	Learn about water condensation
	E	Vocabulary	happen, vapor, condensation, foil, plate, compare
	A	STEAM Project	Condensation ▶
M	21st Century Skills: Critical Thinking, Collaboration		
14 Page 60	S	Title	HOT WATER, COLD LID / WC: 111
	T	Academic Objective	Learn more about condensation
	E	Vocabulary	by oneself, careful, suddenly, lid, normal, boiling
	A	STEAM Project	Condensation in Nature
M	21st Century Skills: Critical Thinking		
15 Page 64	S	Title	PROTECTING THE ENVIRONMENT / WC: 102
	T	Academic Objective	Learn about environmental scientists
	E	Vocabulary	planet, human, pollution, environment, affect, suggest
	A	STEAM Project	What Pollutes Earth?
M	21st Century Skills: Critical Thinking, Collaboration		
16 Page 68	S	Title	GEOLOGISTS STUDY EARTH / WC: 99
	T	Academic Objective	Learn about geology and geologists
	E	Vocabulary	geologist, curious, understand, farming, predict, earthquake
	A	STEAM Project	How Much Do You Know About Earth?
M	21st Century Skills: Critical Thinking, Collaboration, Communication		

STEM

1

I will learn... about how we hear sounds.

HOW SOUNDS MOVE



KEY WORDS

A Look, listen, and repeat. 01



v. reach



v. transfer



n. siren



n. matter



adj. waterproof



n. spot

B Listen and number the words. 02

WARM-UP

Can sounds move through liquids and solids?

READING

Listen and read. 03



We can hear sounds all around us. How do the sounds **reach** our ears?

They **transfer** through things around us.

The sound of a police **siren** moves through the air.

The sound from a dolphin moves through the water.

Sounds can move through wood or metal, too.

Sounds move through solids, liquids, and gases.

Let's watch sound move through one of these types of **matter**.



STEP 1
Add blue food coloring to a large bowl of water.



STEP 2
Put a **waterproof** speaker in the water and turn on some music.



STEP 3
Put a plastic pipe to your ear and try to find the speaker.



STEP 4
The music gets louder as the pipe gets closer to the speaker. You can find the speaker at the **spot** with the loudest sound.

The music came from the speaker. It moved through the water.

It moved through the plastic pipe. Then it arrived in your ears!

C Circle the key words in the reading.

D Read and choose.

1. Which is the opposite of transfer?
a. give b. send c. keep
2. What does spot mean in the reading?
a. place b. dog c. speaker

CHECK YOUR UNDERSTANDING

A Choose the correct answers.

MAIN IDEA

1. What is the main purpose of the reading?
 - a. Sounds transfer only through air.
 - b. Sounds can move through different types of substances.
 - c. Sounds need a speaker to move through different types of matter.

DETAIL

2. In the experiment, we can hear the music because _____.
 - a. the speaker isn't waterproof
 - b. sounds can reach our ears through water
 - c. the speaker is at the spot with the loudest sound

DETAIL

3. Which of the following is NOT needed to do the experiment?
 - a. A plastic pipe
 - b. A siren
 - c. A speaker

B Check true (T) or false (F) for each sentence.

1. Sounds reach our ears because they travel through different types of matter.
2. In the experiment, we hear the sound through the speaker.



C Number the pictures in the correct order.



Put a waterproof speaker in the water and play some music.



Add blue coloring to water.



The music gets louder as the pipe gets closer.



Put a plastic pipe to your ear.

D Choose the correct word.

- Sounds _____ our ears very quickly.
a. mix b. reach c. give
- The sound of the police _____ travels through air.
a. siren b. speaker c. spot
- It will rain this afternoon, so wear your _____ coat.
a. waterproof b. matter c. spot
- “What are the different types of _____?” “Solid, liquid, and gas.”
a. matter b. liquids c. spot



SCIENCE

TECHNOLOGY

ENGINEERING

ARTS

MATH

PROJECT HOW SOUNDS TRANSFER THROUGH SOLIDS

To do this experiment, you will need:



a big metal spoon



1 meter of string

- STEP 1**
- Tie the middle of the string around the middle of the handle of the spoon.
 - Tie one end of the string to your right pointer finger and the other to your left pointer finger.

- STEP 2**
- Put your pointer fingers into your ears so the spoon hangs.
 - Swing the spoon so it hits the wall. What do you hear?

Critical Thinking When the spoon hit the wall, the sound transferred from the **spoon / string** through the **spoon / string** to my **ears / eyes**.