

STEAM

Reading

Beginner

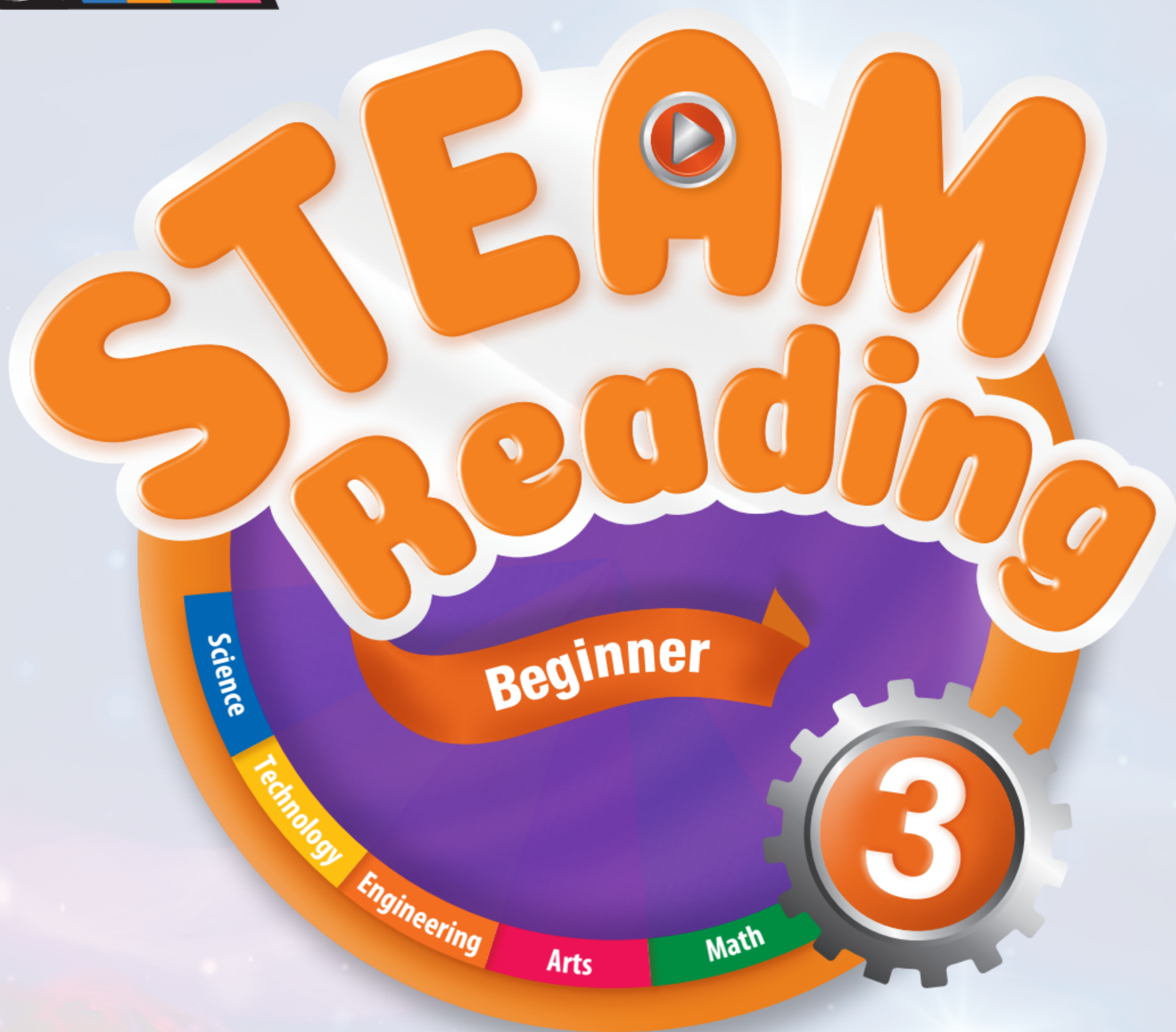
Science Technology Engineering Arts Math

3

★ Beginner
Elementary
High Elementary

 Video Experiments

Matthew Broadhurst



1

2

3

4

5

KEY WORDS

A Look, listen, and repeat.  31



n. test tube



adv. halfway



v. mix




adj. crushed



n. middle



v. stay

B Listen and number the words.  32

48

I will learn... what happens to water when it freezes.

LIQUID TO SOLID



Scan for Audio

WARM-UP

What happens when you put a bottle of water in the freezer?



Scan for Video

READING

Listen and read.  33

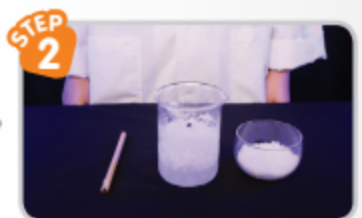
We know a solid keeps its shape and volume.

We know a liquid changes its shape but not its volume.

What happens when a liquid changes to a solid?



Fill a **test tube** **halfway** with water. Mark the height of the water and measure its weight.



Mix salt with **crushed** ice in a cup. Put the test tube in the **middle** of the cup. Freeze the water.

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 3



Now measure the height of the ice in the test tube. Weigh the test tube.



STEP 4



Put the test tube in a cup of warm water. Measure the water level in the test tube again and weigh it.

The liquid water changed into solid ice.

Then it changed into a liquid again. It changed its volume.

The ice was higher.

But the weight didn't change.

It **stayed** the same.

**AHA! I SEE!**

When water becomes a solid, its weight doesn't change. There is the same amount of water as ice, so the ice weighs the same as the water. However, the shape and volume do change when water becomes ice.

6

7

8

C Circle the key words in the reading.

D Read and choose.

1. I'm not the front or the back. I'm not the top or the bottom. I'm the _____.

middle

mix

2. I squeezed the cookie in my hand. It was _____.

crushed

stayed

49

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 AHA! 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 wordlist 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.

- 1.** What is the purpose of the experiment?
a. To watch water turn into ice
b. To see that water expands when it freezes
c. To watch a test tube fill with water
- 2.** What is true about the ice in the test tube?
a. It weighs more than the liquid.
b. It weighs less than the liquid.
c. It weighs the same as the liquid.
- 3.** What TWO things changed when the liquid water became solid?
a. Its volume b. Its shape c. Its weight

B Look, read, and check.

- 1.**  ☐ a. Fill a test tube all the way with water.
☐ b. Fill a test tube halfway with water.
- 2.**  ☐ a. Mix salt with crushed ice.
☐ b. Mix pepper with crushed ice.

C Complete the chart.

- Fill a test tube _____ with water.
- Check the height of the _____ in the test tube and weigh it.
- Put the test tube in a cup with crushed ice.
- Check the height of the _____ in the test tube and weigh it again.






D Circle the correct word.

- 1.**  Scientists use mix / test tubes in experiments.
- 2.**  We had to stop halfway / stay up the hill because we were tired.
- 3.**  We eat lunch in the mix / middle of the day.
- 4.**  Put all the ingredients in a bowl, then stay / mix them together.
- 5.**  Emma wanted to middle / stay in the house all day.
- 6.**  I had a really tasty ice cream. It had crushed / middle cookies in it.

STEAM PROJECT SCIENCE TECHNOLOGY ENGINEERING ARTS MATH

PROJECT SALTED ICE

Did you wonder why we added salt to the water in the experiment on pages 48-49? Let's take a look.

STEP 1 a. Put ice cubes and water in both bowls.
b. Add a handful* of salt to just one of the bowls.
c. Put one can of soda in each bowl.
d. Watch the bowls for five minutes. What do you see?

STEP 2 **Answer the questions.**
Q. Which can is colder?
1. The bowl with ice 2. The bowl with ice and salt
Q. Why is this? Talk as class.

In this unit, we put some salt in the ice, and it made the ice colder.

[Go to page 78 to see the Project Reference.](#) 51

PROJECT REFERENCE

2 LIQUID, GAS, LIQUID

You can see the state of water change.

Materials:



- STEP 1** a. Fill one of the cups with warm water.
b. Turn the other cup upside down and put it on top of the other cup.
c. Put an ice cube on top.
d. Watch and see what happens.

The water in the bottom cup is hot. So the water turns into gas slowly. Then, the ice cube makes the gas cold. It turns into water. It's liquid again.


3 BUILDING A PAPER BRIDGE

We can build a strong bridge!

Materials:



- STEP 1** a. Put two paper cups on the floor with a space between them.
b. Put the sheet of paper on the cups like a bridge.
c. Put one coin on the bridge and two coins on the bridge.

- STEP 2** a. Now fold the paper like this:

b. Put the paper on top of the cups.
c. Put the coins on the bridge.

The flat piece of paper bent very easily. However, when you fold the paper, it increases the paper's length quite a bit, allowing it to form a strong bridge.

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 an unscramble activity featuring sentences taken from the unit reading.

11 LIQUID TO SOLID





VOCABULARY PRACTICE

A Write the letters for each word.

ay mi fw dd st he

-  hal ____ ay
-  ____ x
-  mi ____ le
-  te ____ tube
-  crus ____ d
-  st ____

B Look at the pictures and complete the sentences.

- Exercising is important to  s ____ healthy.
- We used a  t ____ in the science experiment.
-  M ____ flour, water, and eggs in a large bowl.
- I really like this snack. It has marshmallow in the  m ____.

24

SENTENCE PRACTICE

Unscramble and complete the sentences.

- a liquid / happens / when / changes / what
→ _____ to a solid?
- test tube / with / halfway / fill a
→ _____ water.
- salt / crushed / mix / with / ice
→ _____ in a cup.
- the test / in the middle of / the / cup / tube
→ Put _____.
- didn't / weight / but / the
→ _____ change.

SUMMARY

Complete the summary. One word is not used.

crushed halfway height test tube stayed weight

Fill a test tube 1. _____ with water. Check the height and the weight of the water. Put the test tube in the middle of a cup of 2. _____ ice. The water in the 3. _____ freezes. Measure the height and weight again, then put the test tube in a cup of warm water. The ice melts. Measure the 4. _____ and weight again. The ice was higher in the test tube than the water, but the 5. _____ didn't change.

25

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.

TABLE OF CONTENTS

UNIT / PAGE	STEAM	DETAILS	
1 Page 8	S	Title	THE THREE STATES OF WATER / WC: 75 ▶
	T	Academic Objective	Learn about liquids, solids, and gases
	E	Vocabulary	freeze, ice, palm, melt, disappear, frozen
	A	STEAM Project	Solids, Liquids, or Gases?
	M		21st Century Skills: Critical Thinking, Communication
2 Page 12	S	Title	SMOKE OR STEAM? / WC: 89
	T	Academic Objective	Learn how steam is made
	E	Vocabulary	boil, noodles, fire, smoke, pot, steam
	A	STEAM Project	Liquid, Gas, Liquid ▶
	M		21st Century Skills: Critical Thinking, Communication, Collaboration
3 Page 16	S	Title	CRUSHING CUPS / WC: 74 ▶
	T	Academic Objective	Learn how we can spread out our weight
	E	Vocabulary	wet, quickly, floor, row, stand, crush
	A	STEAM Project	Building a Paper Bridge ▶
	M		21st Century Skills: Communication, Critical Thinking
4 Page 20	S	Title	SUPER SKIS / WC: 93
	T	Academic Objective	Learn what pressure is and how it works
	E	Vocabulary	ski, pressure, wear, area, push, spread
	A	STEAM Project	High or Low Pressure
	M		21st Century Skills: Creativity, Collaboration, Critical Thinking
5 Page 24	S	Title	STRAW FLUTES / WC: 67 ▶
	T	Academic Objective	Learn how to make low and high sounds
	E	Vocabulary	straw, blow, arrange, upper, hold, length
	A	STEAM Project	High and Low Notes!
	M		21st Century Skills: Critical Thinking
6 Page 28	S	Title	THE WOLF AND THE WHISTLE / WC: 93
	T	Academic Objective	Learn about loud and quiet sounds
	E	Vocabulary	low, sound, growling, whistle, pocket, travel
	A	STEAM Project	When to Whisper
	M		21st Century Skills: Critical Thinking, Communication, Collaboration
7 Page 32	S	Title	THE PINE CONE'S SECRET / WC: 85 ▶
	T	Academic Objective	Learn facts about pine cones
	E	Vocabulary	pine cone, forest, decoration, dry, shrink, humid
	A	STEAM Project	Pine Cone Snake
	M		21st Century Skills: Creativity, Collaboration, Communication
8 Page 36	S	Title	THE STORY OF THE PINE CONE / WC: 90
	T	Academic Objective	Learn why pine cones open and close
	E	Vocabulary	pine tree, be full of, look after, protect, warm, sunny
	A	STEAM Project	Natural Inventions
	M		21st Century Skills: Creativity, Collaboration, Communication, Critical Thinking

UNIT / PAGE	STEAM	DETAILS	
9 Page 40	S T E A M	Title	ROLL A COIN / WC: 68 🎥
		Academic Objective	Learn how vending machines work
		Vocabulary	vending machine, lay, lean, slide, roll, iron
		STEAM Project	Magnet Painting
			21st Century Skills: Critical Thinking, Collaboration
10 Page 44	S T E A M	Title	TOY COINS / WC: 87
		Academic Objective	Learn what sticks to magnets
		Vocabulary	test, toy, real, only, size, past
		STEAM Project	Metal Cereal 🎥
			21st Century Skills: Critical Thinking
11 Page 48	S T E A M	Title	LIQUID TO SOLID / WC: 60 🎥
		Academic Objective	Learn what happens to water when it freezes
		Vocabulary	test tube, halfway, mix, crushed, middle, stay
		STEAM Project	Salted Ice 🎥
			21st Century Skills: Critical Thinking, Collaboration
12 Page 52	S T E A M	Title	ICE BREAKER / WC: 88
		Academic Objective	Learn why ice takes up more space than water
		Vocabulary	hot, open, freezer, surprised, glass, yogurt
		STEAM Project	Oil and Ice 🎥
			21st Century Skills: Critical Thinking, Creativity
13 Page 56	S T E A M	Title	ROCK-BREAKING RIVERS / WC: 77 🎥
		Academic Objective	Learn how rocks turn into sand
		Vocabulary	bottom, near, pile, bring, river, turn into
		STEAM Project	Sand Art
			21st Century Skills: Creativity, Communication
14 Page 60	S T E A M	Title	ADVENTURES OF SPRING WATER / WC: 96
		Academic Objective	Learn how water changes the land around it
		Vocabulary	spring water, flow, begin, trip, through, ocean
		STEAM Project	Bodies of Water
			21st Century Skills: Critical Thinking, Communication
15 Page 64	S T E A M	Title	BUILDING WORLDS / WC: 87
		Academic Objective	Learn about virtual reality and how it is made
		Vocabulary	headset, forward, backward, creator, film, special
		STEAM Project	Making a Virtual World
			21st Century Skills: Critical Thinking, Collaboration, Communication
16 Page 68	S T E A M	Title	FLOWER POWER / WC: 70
		Academic Objective	Learn about plants and botanists
		Vocabulary	know, world, climb, trouble, medicine, fun
		STEAM Project	Be a Botanist
			21st Century Skills: Creativity, Critical Thinking, Communication