

# STEAM

## Reading

High Elementary

Science Technology Engineering Arts Math

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**1** STEAM

**2** I WILL LEARN...

**3** QR CODES

**4** KEY WORDS

**5** LISTEN AND NUMBER THE WORDS

**AIR PRESSURE CREATES WIND**

I will learn... about air pressure and wind.

**WARM-UP**  
Do you know where the wind comes from?

**KEY WORDS**

**A** Look, listen, and repeat. 01

adj. tiny

n. particle

phr. blow up

n. binder clip

adj. thick

v. remove

phr. all the way

n. molecule

**B** Listen and number the words. 02

**READING**

Listen and read. 03

Air is all around us.  
It's made of **tiny particles**. These particles don't stay still. They are always moving.  
But why does it move? And how does it move?  
Let's look for ourselves.

**STEP 1**

Blow up a balloon to three-quarters of the size and tie the end with a **binder clip**.

### 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.





Put the end of the balloon onto a **thick** tube.



Blow up another balloon halfway and tie the end using a binder clip. Put the balloon on the other end of the tube.



**Remove** the clips from both balloons. Watch the air move inside the balloons.

What do you think will happen? Will the air move? Will it stay in the same place?

Which balloon will get bigger and which will get smaller? Why did the big balloon get bigger and expand **all the way** while the small one got smaller? It's because air moves from areas of higher pressure to areas of lower pressure.

The air inside the small balloon is in a smaller space. So the air **molecules** are closer together, causing high pressure. The air molecules in the larger balloon are spread out, causing lower pressure. The air moves from the small balloon to the big balloon. Air moves like this in nature as well. We call it "wind."

#### **C Read and choose.**

1. What does it mean in the reading?  
a. the binder clip      b. the air      c. the balloon
2. Which is the opposite of **remove**?  
a. put back      b. take off      c. blow up

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#### **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 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**

**1 Choose the correct answers.**

- What is the purpose of the reading?
  - To explain how to measure speed
  - To explain why a bicycle is faster than a train
  - To explain how to put paper cars on the starting line
- One of the ways to measure speed is \_\_\_\_\_.
  - to compare the distance between two objects
  - to compare the speed of two objects over the same distance
  - to compare the speed of two objects over a different distance
- Which of the following is NOT needed to do the experiment?
  - Paper cars
  - A train
  - A tape measure

**2 Circle T for true or F for false. Correct the false statements.**

- The person who finishes last in a race is the fastest runner. T F
- In the experiment, the first car is the fastest because it goes the farthest in the same amount of time. T F

**3 Complete the chart.**

	distance	time	for	race	tape measure
Sign	There are two ways to compare the speed of objects.				
Method 1	To compare how fast objects travel over the same _____		This is what happens in a _____ The first to finish is the fastest.		
Method 2	To compare how _____ objects can go over the same amount of time		Prepare three paper cars and a _____ Use _____ to make the paper cars move. The car that goes the farthest is the fastest.		

**4 Complete the sentences.**

distance time for set tape measure vertical

- Why don't you walk to school? You don't live \_\_\_\_\_ from there.
- Did your teacher \_\_\_\_\_ the date for the final exam?
- It's so hot! Don't you have a \_\_\_\_\_ to cool the air?
- The \_\_\_\_\_ between Earth and the Moon is 384,400 km.
- We need a \_\_\_\_\_ to measure the height of the door.
- Her shirt has a pattern of \_\_\_\_\_ stripes.

**PROJECT WHICH IS THE FASTEST SPORT?**

Here are some sports and the speeds at which you need to move to do them.

**STEP 1** Match the sport to the photo.

Sport	Speed
Football	322 km/h
Football (soccer)	30 km/h
Ice hockey	32 km/h
Speed skating	240 km/h
Speed*	40 km/h

**STEP 2** Put the sports in order from fastest to slowest.

**STEP 3** Share your results with a partner.

## 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.

**PROJECT REFERENCE**

**UNIT 12 THE VOLUME OF GASES IN OUR DAILY LIFE**

You can see more examples of gases changing volume with temperature in everyday life. See the chart below.

Volume	Example	Explanation
Volume increases	Bread rising in a hot oven	Heat in bread releases carbon dioxide. In the hot oven, the carbon dioxide bubbles expand and make the bread spongy.
	Spray cans	Spray cans have warnings not to store them at high temperatures. This is because the air molecules inside the can will expand and cause the can to burst or explode.
Volume decreases	A basketball	A basketball shrinks in size when the temperature decreases. However, it gets its shape back when you bring it to a warm room again.
	A balloon	A balloon gets smaller when there's a change in the surrounding temperature. If you bring the balloon outside on a cold day, it gets smaller.

**UNIT 13 WHAT DOES THE STEM TASTE LIKE?**

Let's see how stems carry water to leaves or flowers by doing this experiment.

**Materials:**

- Two celery stems
- Two bowls
- Six spoons of salt
- Six spoons of sugar

**STEP 1**

- Cut two celery stems to 12 cm long. Dissolve salt into water in one of the bowls. Dissolve sugar into water in the other bowl.
- Put one celery stem in each bowl. Leave the celery the whole night in the different bowls.
- The next morning, take one stem out of a bowl. Bite it. Do the same with the other stem.

A stem carries water, minerals, and nutrients from the roots to the leaves. In this experiment, the salty water and the sugary water move up the stems. You can taste the salt and sugar because the stems contain the water.

## 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.

## COMPREHENSION PRACTICE





These questions focus on a passage from the reading and check students' understanding of the text.

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A RACE TO GRANDFATHER'S HOUSE

### VOCABULARY PRACTICE

**A** Circle the correct words.

1.  24 looked for / divided by / multiplied by 3 is 8.
2.  What time did you win / arrive / finish at the station?
3.  Every time we play tennis, he wins / leaves / arrives.
4.  How many minutes / speeds / kilometers per hour does your car go?

**B** Choose the correct words.

1. The \_\_\_\_\_ of a car is how fast it moves in a certain distance.  
a. velocity      b. race      c. distance
2. The children \_\_\_\_\_ for school every day at 8 o'clock.  
a. circulate      b. leave      c. carry
3. It took me an hour to \_\_\_\_\_ the solution to the math problem.  
a. work out      b. build      c. pull in
4. If you want to \_\_\_\_\_ more about our company, you can visit our website.  
a. come up      b. divide by      c. find out

### COMPREHENSION PRACTICE

**Read the following passage and choose the correct answers.**

"We need to work out the velocity," says Uncle Pete. "Your home is 240 kilometers away from Grandfather's. It took you 3 hours, so divide 240 km by 3 hours. That's 80 km/h. Or, if you divide 240 by 3, you make 70 km/h."

1. How far is the moon harbor's house from Grandfather's?  
a. 70 kilometers      b. 80 kilometers      c. 240 kilometers
2. What is the best place for the sentence below?  
My home is 140 kilometers away from here, and I took 2 hours to get here.  
a. ①      b. ②      c. ③
3. What does divide mean in the passage?  
a. subtract      b. add      c. split

### SUMMARY

**Complete the summary. One word is not used.**

arrive   distance   explains   find out   leave   traveled   velocity   win

Sally and her uncle Pete are visiting her grandfather. Both i. \_\_\_\_\_ at 10 a.m. "At what time did you s. \_\_\_\_\_ home?" Sally asks. Her uncle says he left at 8 a.m. and it took 2 hours to reach Sally's grandfather's. Sally left home at 7 a.m., and it took her 3 hours to arrive. She wants to s. \_\_\_\_\_, whose car was faster. Her uncle s. \_\_\_\_\_ they have to work out their cars' s. \_\_\_\_\_. To do that, they have to divide the s. \_\_\_\_\_ in kilometers from their houses to grandfather's house by the time it took them to arrive. Sally's car did 240 km in 3 hours, so it is \_\_\_\_\_ at 80 km/h. Uncle Pete's car traveled at 70 km/h. So Sally is the winner.

## 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	
<b>1</b> Page 8	S T E A M	Title	AIR PRESSURE CREATES WIND / WC: 149
		Academic Objective	Learn about air pressure and wind
		Vocabulary	tiny, particle, blow up, binder clip, thick, remove, all the way, molecule
		STEAM Project	An Air Pressure Experiment
			<b>21st Century Skills:</b> Critical Thinking
<b>2</b> Page 12	S T E A M	Title	THE WEATHER FORECAST / WC: 144
		Academic Objective	Learn about air pressure and weather forecasts
		Vocabulary	weather forecast, continue, expect, southern, region, business trip, cancel, in advance
		STEAM Project	Climate and Weather
			<b>21st Century Skills:</b> Critical Thinking, Collaboration, Creativity, Communication
<b>3</b> Page 16	S T E A M	Title	HOW DOES HEAT MOVE LIQUIDS? / WC: 134
		Academic Objective	Learn about heat and liquids
		Vocabulary	kettle, heat, finally, water tub, support, dropper, process, convection current
		STEAM Project	Make a Convection Snake
			<b>21st Century Skills:</b> Critical Thinking, Collaboration
<b>4</b> Page 20	S T E A M	Title	WATER MOVES AROUND THE WORLD / WC: 156
		Academic Objective	Learn about water currents and how they move
		Vocabulary	equator, circulation, seawater, per, take, thousand, circulate, whole
		STEAM Project	How Seawater Currents Work
			<b>21st Century Skills:</b> Critical Thinking
<b>5</b> Page 24	S T E A M	Title	GROWING MUSHROOMS / WC: 182
		Academic Objective	Learn about mushrooms and how to grow them
		Vocabulary	fungus (fungi), mold, nutrient, alive, instruction, include, spawn, spore
		STEAM Project	The Life Cycle of Mushrooms
			<b>21st Century Skills:</b> Critical Thinking
<b>6</b> Page 28	S T E A M	Title	I AM NOT A PLANT! / WC: 138
		Academic Objective	Learn about the differences between mushrooms and plants
		Vocabulary	mushroom, wide, stalk, photosynthesis, dead, reproduce, gill, land
		STEAM Project	Some Facts About Fungi
			<b>21st Century Skills:</b> Critical Thinking, Communication
<b>7</b> Page 32	S T E A M	Title	WATER DROPS / WC: 126
		Academic Objective	Learn about surface tension
		Vocabulary	state, surface tension, penny, pipette, one at a time, count, spill, eventually
		STEAM Project	Toothpick Surface Tension Experiment
			<b>21st Century Skills:</b> Critical Thinking
<b>8</b> Page 36	S T E A M	Title	A WATER STRIDER / WC: 138
		Academic Objective	Learn more about surface tension
		Vocabulary	water strider, reservoir, look like, thin, pair, scientific, fine, spread out
		STEAM Project	Water Striders
			<b>21st Century Skills:</b> Critical Thinking

UNIT / PAGE	STEAM	DETAILS	
<b>9</b> Page 40	S T E A M	Title	SPEED RACERS / WC: 153 ▶
		Academic Objective	Learn about how to compare the speed of objects
		Vocabulary	distance, race, far, starting line, tape measure, vertical, set, fan
		STEAM Project	Which Is the Fastest Sport? <b>21st Century Skills:</b> Critical Thinking, Collaboration, Communication
<b>10</b> Page 44	S T E A M	Title	A RACE TO GRANDFATHER'S HOUSE / WC: 145
		Academic Objective	Learn how to work out velocity
		Vocabulary	arrive, leave, find out, work out, velocity, kilometer, divide by, win
		STEAM Project	Speed, Time, and Distance <b>21st Century Skills:</b> Critical Thinking, Communication
<b>11</b> Page 48	S T E A M	Title	THE CHANGING VOLUME OF GASES / WC: 132 ▶
		Academic Objective	Learn about the volume of gases
		Vocabulary	table tennis, step on, by mistake, triangular, flask, return, original, knowledge
		STEAM Project	How Can You Fix the Crushed Ball? ▶ <b>21st Century Skills:</b> Critical Thinking
<b>12</b> Page 52	S T E A M	Title	COLD AIR, HOT AIR / WC: 128
		Academic Objective	Learn about the relationship between temperature and the volume of a gas
		Vocabulary	stew, weird, plastic wrap, curved, downward, rotten, microwave, take off
		STEAM Project	The Volume of Gases in Our Daily Life <b>21st Century Skills:</b> Critical Thinking, Collaboration, Creativity, Communication
<b>13</b> Page 56	S T E A M	Title	STEMS CARRY WATER / WC: 142 ▶
		Academic Objective	Learn about the function of the stem in a plant
		Vocabulary	root, stem, lily, horizontally, vertically, dot, appearance, wind
		STEAM Project	What Does the Stem Taste Like? ▶ <b>21st Century Skills:</b> Critical Thinking
<b>14</b> Page 60	S T E A M	Title	GRANDMOTHER'S GARDEN / WC: 141
		Academic Objective	Learn more about different types of stems
		Vocabulary	weekend, dig up, sweet potato, upright, crawl, stolon, morning glory, pie
		STEAM Project	Parts of a Plant <b>21st Century Skills:</b> Critical Thinking, Creativity, Collaboration, Communication
<b>15</b> Page 64	S T E A M	Title	WHAT'S THE WEATHER LIKE TODAY? / WC: 140
		Academic Objective	Learn about the weather and meteorologists
		Vocabulary	meteorologist, weather balloon, record, atmospheric pressure, information, analyze, report, weather forecaster
		STEAM Project	Make a Pinwheel ▶ <b>21st Century Skills:</b> Communication, Critical Thinking, Creativity, Collaboration
<b>16</b> Page 68	S T E A M	Title	HYDRO HELPERS / WC: 144
		Academic Objective	Learn about water and hydrologists
		Vocabulary	fresh water, rest, salty, keep, hydrologist, contaminated, groundwater, life
		STEAM Project	Make a Water Saving Poster <b>21st Century Skills:</b> Critical Thinking, Collaboration, Communication, Creativity





I will learn... about air pressure and wind.

# AIR PRESSURE CREATES WIND



Scan for Audio

## KEY WORDS

**A** Look, listen, and repeat. 01



*adj.* tiny



*n.* particle



*phr.* blow up



*n.* binder clip



*adj.* thick



*v.* remove



*phr.* all the way



*n.* molecule

**B** Listen and number the words. 02

## WARM-UP

Do you know where the wind comes from?

## READING

Listen and read. 03



Scan for Video

Air is all around us.

It's made of **tiny particles**. These particles don't stay still. They are always moving.

But why does it move? And how does it move?

Let's look for ourselves.



**Blow up** a balloon to three-quarters of the size and tie the end with a **binder clip**.







Put the end of the balloon onto a **thick** tube.



Blow up another balloon halfway and tie the end using a binder clip. Put the balloon on the other end of the tube.



**Remove** the clips from both balloons. Watch the air move inside the balloons.

Which balloon will get bigger and which will get smaller? Why did the big balloon get bigger and expand **all the way** while the small one got smaller? It's because air moves from areas of higher pressure to areas of lower pressure.

The air inside the small balloon is in a smaller space. So the air **molecules** are closer together, causing high pressure. The air molecules in the larger balloon are spread out, causing lower pressure. The air moves from the small balloon to the big balloon. Air moves like this in nature as well. We call it "wind."

### **c Read and choose.**

1. What does it mean in the reading?
  - a. the binder clip
  - b. the air
  - c. the balloon
2. Which is the opposite of remove?
  - a. put back
  - b. take off
  - c. blow up

# CHECK YOUR UNDERSTANDING

## A Choose the correct answers.

### MAIN IDEA

1. What is the main purpose of the reading?
  - a. To explain how air pressure creates wind
  - b. To explain how air particles always stay in the same place
  - c. To explain why air molecules move from the big to the small balloon

### DETAIL

2. Wind is created when air moves from \_\_\_\_\_.
  - a. the big to the small balloon
  - b. areas of lower pressure to those of higher pressure
  - c. areas of higher pressure to those of lower pressure

### DETAIL

3. Which of the following is NOT needed to do the experiment?
  - a. Two balloons
  - b. A thick tube
  - c. A particle

## B Circle T for true or F for false. Correct the false statements.

1. Air is made of large particles that are always still. T F  
\_\_\_\_\_
2. The air molecules in the bigger balloon are close together and cause high pressure. T F  
\_\_\_\_\_

## C Complete the chart.

binder clip   blow up   higher   lower   remove   thick

### Step 1

Blow up a balloon three-quarters full and tie the end with a binder clip.

### Step 2

Put the end of the balloon onto a(n) 1. \_\_\_\_\_ tube.

### Step 3

2. \_\_\_\_\_ a second balloon halfway and tie the end with another 3. \_\_\_\_\_. Put the balloon over the other end of the tube.

### Step 4

4. \_\_\_\_\_ the clips from the two balloons.

### Conclusion

Air moves from areas of 5. \_\_\_\_\_ pressure to those of 6. \_\_\_\_\_ pressure.

## D Complete the sentences.

all the way    blow up    molecule    particles    thick    tiny

1. Air is made of very tiny \_\_\_\_\_.
2. She has a(n) \_\_\_\_\_ cat that can fit inside her bag.
3. We are about to \_\_\_\_\_ balloons for Henry's party.
4. We need a(n) \_\_\_\_\_ tube to do this experiment.
5. In the experiment, the bigger balloon expands \_\_\_\_\_.
6. A(n) \_\_\_\_\_ is an elementary particle.



SCIENCE

TECHNOLOGY

ENGINEERING

ARTS

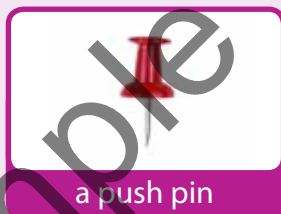
MATH

### PROJECT AN AIR PRESSURE EXPERIMENT

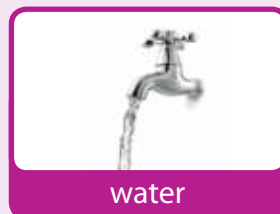
To do this experiment, you will need:



a plastic bottle



a push pin



water



Scan for Video

#### STEP 1

**Critical Thinking**

- a. Fill your bottle with water. Put on the cap and close it tightly.
- b. Push the pin into the bottle.
- c. Pull it out.  
Q. What happens?  
A. The water **comes out through the hole** / **stays in the bottle**.
- d. Press the bottle with your hand.  
Q. What happens?  
A. The water **comes out through the hole** / **stays in the bottle**.
- e. Now, take the cap off the top of the bottle.  
Q. What happens?  
A. The water **comes out through the hole** / **stays in the bottle**.

#### STEP 2

**Critical Thinking**

Why does this happen?

Air is all around us, and it pushes **up** / **down** on us. It pushes against the hole, so the water **comes out of** / **stays inside** the bottle. When we take the cap off, air gets **out of** / **into** the bottle, and it pushes the water **up** / **down**. The water comes out through the hole.