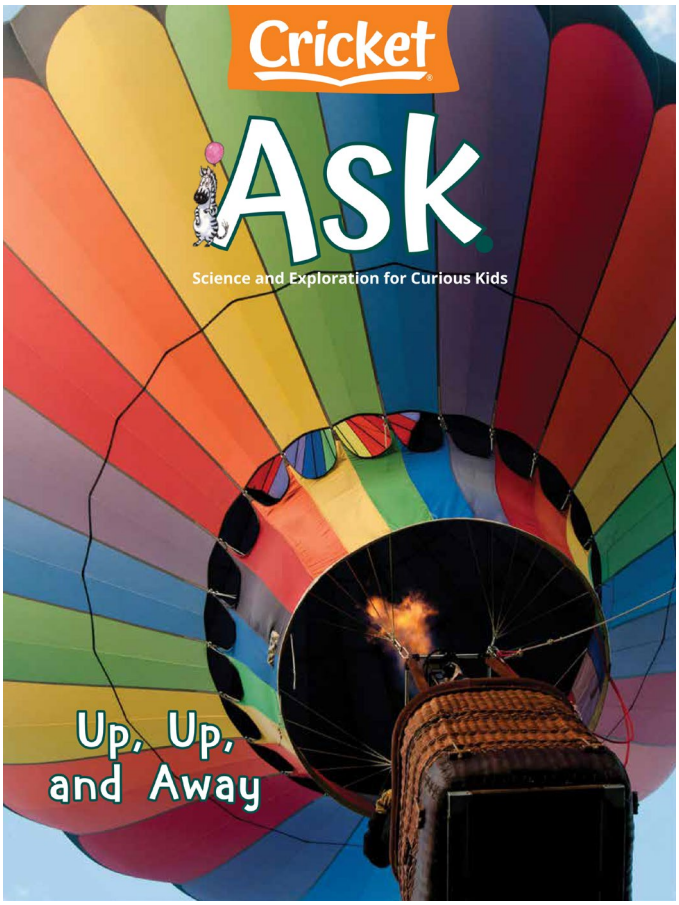
Ask® Teacher Guide: April 2022

Ask®

Up, Up, and Away

We know we need air to live, though most days we don't give it a second thought. This issue of ASK magazine breezes through a variety of topics—from bubble gum to balloons—and guides readers to consider how air can be both an essential element and a source of entertainment.



CONVERSATION QUESTION

How can we use air?

TEACHING OBJECTIVES

- **Students will learn why a fish's swim bladder is its most essential organ.**
- **Students will learn how bubble gum was invented.**
- **Students will learn about the balloon sculptures created by Jason Hackenwerth.**
- **Students will examine the structure and functions of a fish's swim bladder.**
- **Students will analyze problem-and-solution relationships.**
- **Students will construct explanations.**
- **Students will conduct a classic science experiment.**
- **Students will use a mathematical formula to solve a theme-based word problem.**
- **Students will research why balloons are an environmental concern.**

In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **There's a Balloon in My Belly!**
Expository Nonfiction, ~960L
- **Pop! The Invention of Bubble Gum**
Expository Nonfiction, ~770L
- **Blowing Up Art**
Expository Nonfiction, ~920L

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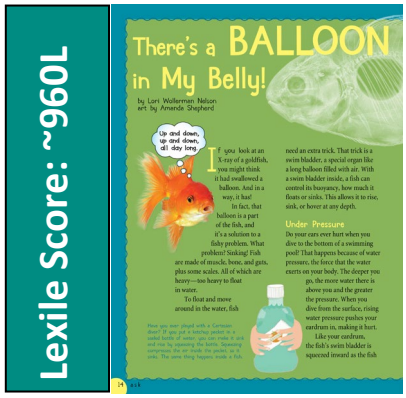
There's a Balloon in My Belly!

pp. 14–17 Expository Nonfiction

Readers will learn how a fish's swim bladder allows it to rise, sink, or hover at any depth.



RESOURCES

- Structure and Function: Something's Fishy

OBJECTIVES

- Students will learn why a fish's swim bladder is its most essential organ.
- Students will examine the structure and functions of a fish's swim bladder.
- Students will conduct a classic science experiment.

KEY VOCABULARY

- ***compresses* (p. 14)** flattens by pressure; squeezes or presses
- ***expands* (p. 15)** becomes bigger

ENGAGE

Conversation Question: How can we use air?

Get students motivated by allowing them 15 minutes to play a game of Go Fish. This traditional card game for two to five players can be played using a standard deck of cards. Five cards are dealt to each player and the remaining cards are placed facedown in a pile. The object is to make matches by asking another player for a card of a certain value or taking a card from the pile. After the game, ask: "Why don't fish sink?"

INTRODUCE VOCABULARY

Display the following statements and underline the key vocabulary terms. Review how to infer the meanings of new words by using context clues and background knowledge. Then have partners work together to determine the meaning of each word. Reveal definitions.

- The factory has a machine that compresses old cars into scrap metal.
- Breathe in by allowing your abdominal muscles to expand outward.

READ & DISCUSS

Reinforce comprehension of the concepts and details presented in the article by using the following prompts to direct discussion.

1. What problem does the swim bladder solve for the fish?
2. Why do your ears hurt when you dive to the bottom of a swimming pool?
3. Why do things float?
4. What is neutral buoyancy?
5. Explain how diffusion moves gases between a fish's blood and its swim bladder.

SKILL FOCUS: Structure and Function

INSTRUCT: Elicit from students that the main idea of the article is to provide information that details why the fish's swim bladder is its most essential organ. Present the *Structure and Function: Something's Fishy* graphic organizer, and tell students they will be using information from the article to describe the functions of this important body part.

ASSESS: Circulate and discuss content with students. Collect graphic organizers to assess students' ability to understand the structure-and-function relationship.

EXTEND

Science Read aloud the blue text at the bottom of page 14, which describes a classic science experiment called the Cartesian diver. Then have students make their own Cartesian divers. Each student, student pair, or group will need an empty plastic soft drink bottle with a cap and a ketchup packet from a fast-food restaurant. Have students set up the experiment by placing the ketchup packet in the bottle, filling the bottle with water, and placing the cap on the bottle. Then have them squeeze the bottle and describe what happens. Afterward, ask: "What did you learn from this experiment? How does what happened to the ketchup packet relate to the functioning of the swim bladder?"

Something's Fishy

Structure and Function Review the article to find passages that explain how a fish's most important structure—its swim bladder—helps it to function. Use this information to help you answer the questions below. Write your answers in the space provided.

Structure: Swim Bladder	
How does the swim bladder function?	
Why do fish add and release air from their swim bladder?	
How do swim bladders help fish to hear and "talk"?	

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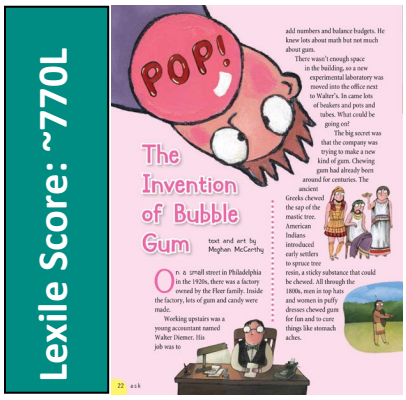
Pop! The Invention of Bubble Gum

pp. 22–25, Expository Nonfiction

In the 1920s, workers at a Philadelphia candy company were trying to develop a new gum. In the end, it was the office accountant who was responsible for creating bubble gum. Readers will travel back in time and share the inventor's joy as the first bubble pops.



RESOURCES

- Problems and Solutions: Bubble Trouble

OBJECTIVES

- Students will learn how bubble gum was invented.
- Students will analyze problem-and-solution relationships.
- Students will use a mathematical formula to solve a theme-based word problem.

KEY VOCABULARY

- ***budget* (p. 22)** a plan used to decide the amount of money that can be spent and how it will be spent
- ***kettle* (p. 23)** a container used for heating or boiling liquid
- ***prancing* (p. 24)** walking or moving in a lively and proud way

ENGAGE

Conversation Question: How can we use air?

Activate prior knowledge by having students work in pairs to brainstorm adjectives that describe the experience of chewing bubble gum. Encourage students to use all five senses to create their word list. Then have partners write one super sentence about gum-chewing that incorporates their most interesting adjectives. Tell students to notice if any of their words appear in the article.

INTRODUCE VOCABULARY

Post and discuss the key vocabulary words and definitions. Then display the cloze sentences below and have students supply the correct word:

1. The soccer players were ___ around the field after they won the game.
2. Stan made a ___ so he could buy birthday presents for his triplet sisters.
3. I filled the ___ with water and put it on the stove to boil.

READ & DISCUSS

Read the article aloud with the class. Have students reread the article with a partner to answer the questions below. Discuss responses.

1. What natural substances were used as gum in early history?
2. Why did people in the 1800s chew gum?
3. What circumstances made it possible for Walter Diemer, an accountant, to invent Dubble Bubble?
4. Explain how bubble gum's four ingredients produce its taste and texture.
5. Who were the first people to try bubble gum?
6. What words would you use to describe Walter Diemer?

SKILL FOCUS: Problems and Solutions

INSTRUCT: Inform students that they will be rereading the article with a partner and highlighting passages that describe how Walter Diemer solved problems that arose during the bubble gum making process. Then distribute the *Problems and Solutions: Bubble Trouble* graphic organizer to students. Tell students they will explain in writing how Walter Diemer solved the problems listed in the organizer.

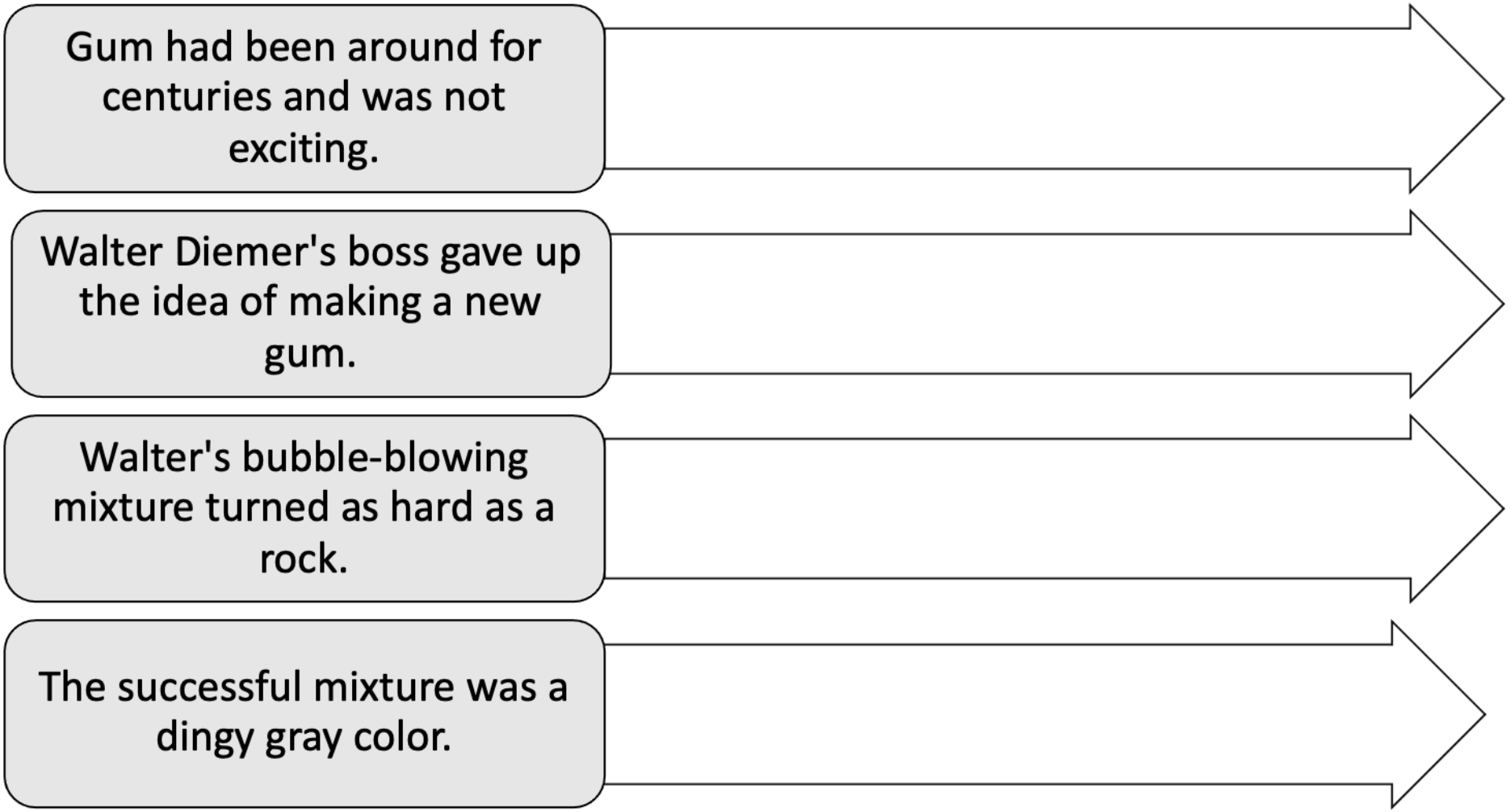
ASSESS: Collect the worksheets to evaluate students' ability to clearly identify the problem-and-solution relationships.

EXTEND

Geometry Share the following background information with students: According to the Guinness World Records website, Chad Fell (USA) holds the record for blowing the largest hands-free bubble gum bubble. Chad's secret? Blowing with three pieces of Dubble Bubble gum. (Walter Diemer would be proud!) Point out that Fell's history-making bubble had a diameter of 20 inches. Then have students determine the circumference (distance around the bubble) by using the mathematical formula, $C = \pi d$ (circumference = 3.14 × diameter). **Answer:** 62.8 inches.

Bubble Trouble

Problems and Solutions Review the article and locate the passages that discuss the problems in the gray boxes. Then explain how the problems were solved by Walter Diemer's persistence.



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Blowing Up Art

pp. 26–28, Expository Nonfiction

Balloons aren't just for parties. This article uses colorful photographs to enhance text that beautifully describes the balloon sculptures created by artist Jason Hackenwerth.

RESOURCES

- Constructing Explanations: Pop Art

OBJECTIVES

- Students will learn about the balloon sculptures created by Jason Hackenwerth.
- Students will construct explanations.
- Students will research why balloons are an environmental concern.

KEY VOCABULARY

- ***eye-catching* (p. 27)** very noticeable because of being unusual or attractive
- ***inflator* (p. 27)** a mechanical pump used to fill something with air
- ***impermanence* (p. 28)** the quality of being temporary; not lasting forever

ENGAGE

Conversation Question: How can we use air?

Protect working surfaces with newspaper and gather the following materials: paper, straws, liquid watercolors (or watery paint). Spoon a small amount of paint onto students' papers and have them use their straws to blow the paint around, creating abstract art. (Putting the paper in a tray could avoid messes.) Add different colors until students are satisfied with their masterpieces. Discuss how air force (breath) and air direction affected their paintings.

INTRODUCE VOCABULARY

Post and discuss the key terms and the title of the article. Be sure that students understand the definitions before reading the text. As a post-reading activity, have students use the three vocabulary words to summarize the article in paragraph form.

READ & DISCUSS

After students read the article, pose the following questions to prompt meaningful discussion.

1. The first paragraph states that Hackenwerth's sculptures have as much in common with birthday balloons as finger paintings have with the Mona Lisa. What does the author mean by this?
2. How did Hackenwerth use balloon flowers to see if they would captivate the public?
3. Why does Hackenwerth like to hang sculptures from the ceiling?
4. What are Hackenwerth's wearable sculptures used for?
5. What happens to the balloons after a show is done?

SKILL FOCUS: Constructing Explanations

INSTRUCT: Advise students to review the article and to study how the element of air is used to create amazing art displays. Distribute the *Constructing Explanations: Pop Art* graphic organizer and tell students they will use information directly from the text to complete the first section of the worksheet. In the other two sections, they must use details and critical thinking to write about using the elements in art.

ASSESS: Have students share their original ideas with the class. Challenge them to try to create art at home using air/water.

EXTEND

Environment Remind students that Hackenwerth only uses natural latex balloons. When a show is done, the deflated balloons are shredded and added to landfill, where they will decompose. Explain that improperly discarded balloons can end up in the ocean, where their ingestion can cause starvation and death for marine wildlife. Instruct students to research the garbage polluting our seas. Have students work in groups to create posters reminding others of the dangers of being careless when disposing of plastics and balloons. Display the posters throughout the school. Earth Day is Friday, April 22, 2022.

Pop Art

Constructing Explanations Review the article and reread passages that explain how Jason Hackenwerth uses air to create his sculptures. Then use your creative and critical thinking skills to explain how you might use air to create art and how water might be used to create art.

AIR

How does Jason Hackenwerth use air to create art?

How can YOU use air to create art?

WATER

How can water be used to create art?