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## SOLUTIONS 328

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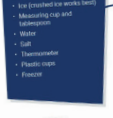
A vibrant cartoon illustration of a jazz band performing in a cafe. The band consists of a purple cat on drums, a blue elephant on double bass, a purple bear on piano, and a purple dog on saxophone. A pink pig is the lead singer. A purple cat waiter serves a cup of coffee. The scene is lively with musical notes and a 'JAZZ' sign.

# SUB-ZERO

How does salt affect ice formation in the ocean?

## MATERIALS

- Two ice cube trays
- Four smaller glasses
- Ice (measured in ounces/100)
- Measuring cup and thermometer
- Water
- Salt
- Thermometer
- Plastic cups
- Freezer



Draw two similar glasses with cracked ice.

Fill two more glasses with ice and salt water. Add 1 tablespoon of salt to one glass of water. Measure the temperature and observe. Measure the temperature after each glass gets warm; record your results on the next page.

Place the salt water in one glass of salt water and the water in the other glass. Sit the ice in the water in the freezer.

Use a thermometer to measure the temperature of the water and observe. Record your results and observations on the next page.

Now working together, The Team

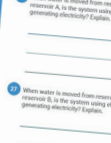
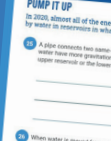
### PUMP IT UP

In 2020, almost all of the energy storage connected to electrical grids was stored by water in reservoirs in what is called pumped hydroelectric storage.

29. A color reservoir has some solid materials. Does the water have more gravitational energy when it's in the upper reservoir or the lower reservoir? Explain.

30. When water is moved from reservoir A into reservoir B, is the system using electricity or generating electricity? Explain.

31. When water is moved from reservoir A into reservoir B, is the system using electricity or generating electricity? Explain.



Shawn Academy, Science 101

## QUESTION TYPES

Every question students are expected to answer is numbered and has an answer or brief discussion in the back, beginning on page 328.

There are a wide variety of question types including ones marked by the icons below:

### ★ CHALLENGE:

Starred questions and tasks have hints in the back starting on page 324.

### 💬 DISCUSSION:

Find a partner or group and work through these questions together.

### 💻 RESEARCH:

Students will need access to online resources to answer these questions.

### 📓 JOURNAL:

Collect answers to these questions in a separate science journal notebook.

## STANDARDS

BA Science 4B content is aligned to the Next Generation Science Standards (NGSS), but often goes well beyond what is typically expected of students. Together with 4A, Level 4 will cover all of the concepts, practices, and standards outlined for grade 4.

Among the NGSS standards covered in this book are:

### Energy (Unit 1: Chapters 1-6)

Explore strategies of using Earth's resources for energy. (4-ESS3-1)  
Design a device that changes energy into a different form. (4-PS3-4)



### Processes that Shape Earth (Unit 2: Chapters 7-10)

Identify solutions to reduce harm from natural disasters. (4-ESS1-1)



### Waves and their Applications (Unit 2 & 3: Chapters 7-16)

Describe and model features of waves. (4-PS4-1)  
Explain how the reflection of light allows animals to see. (4-PS4-2)  
Compare strategies for transmitting information. (4-PS4-3)



### Structure and Function (Unit 3: Chapters 11-16)

Explore how organisms react to the world using senses. (4-LS1-2)

# MATERIALS

## SCIENCE JOURNAL

Every student should collect their work in a science journal. Any notebook will do.

## COMMON ITEMS (Used in several activities)

- Scissors
- Paperclips
- Water
- Tape
- Standard 6-sided dice
- Salt
- Calculator
- Disposable straws
- Freezer
- Ruler
- Spoons
- Video camera (optional)

## CHAPTER 3

- Index cards
- Paper cups
- Floss

## CHAPTER 7

- Plastic water bottle
- Cocoa powder
- Olive oil
- Empty milk carton
- Drinking glass
- Ice cube tray

## CHAPTER 8

- Fruit juice
- Small heavy object
- Thermometer
- Large clean bowl
- Four drinking glasses
- Plastic cups
- Small clean bowl or glass
- Ice
- One fresh egg
- Plastic wrap
- Measuring cups
- Tablespoon

## CHAPTER 9

- Pepper flakes
- Two identical plastic bottles
- Hot and cold water
- Shallow bowl or plate
- Thin waterproof card (used gift card or similar)
- Food coloring
- Small game tokens
- Pitchers (optional)
- Towels
- Large tray

## CHAPTER 10

- 8-ft long rope (at least one-eighth inch thick)
- Large cake pan (2 inches or deeper)
- Large, rimmed baking sheet
- Towels
- Aluminum foil
- Pans of various sizes (optional)

## CHAPTER 11

- Blindfold

## CHAPTER 12

- Tone generator app
- Empty tissue box
- Rubber bands (many sizes)
- 3 identical glass bottles
- 10 counters in 2 colors (buttons, beans, or similar)
- 2 folders

## CHAPTER 13

- Large bowl
- Handheld mirror
- White folder or paper
- Water hose (optional)
- Cereal box
- Tracing paper, parchment paper, or similar
- Magnifying glass (optional)
- Masking tape
- Paper towel tube
- Standard deck of playing cards
- Softball or similar

## CHAPTER 14

- Flashlight (optional)

## CHAPTER 15

- Paper towel tube
- Food coloring
- 3 small bowls
- Yogurt
- Index cards

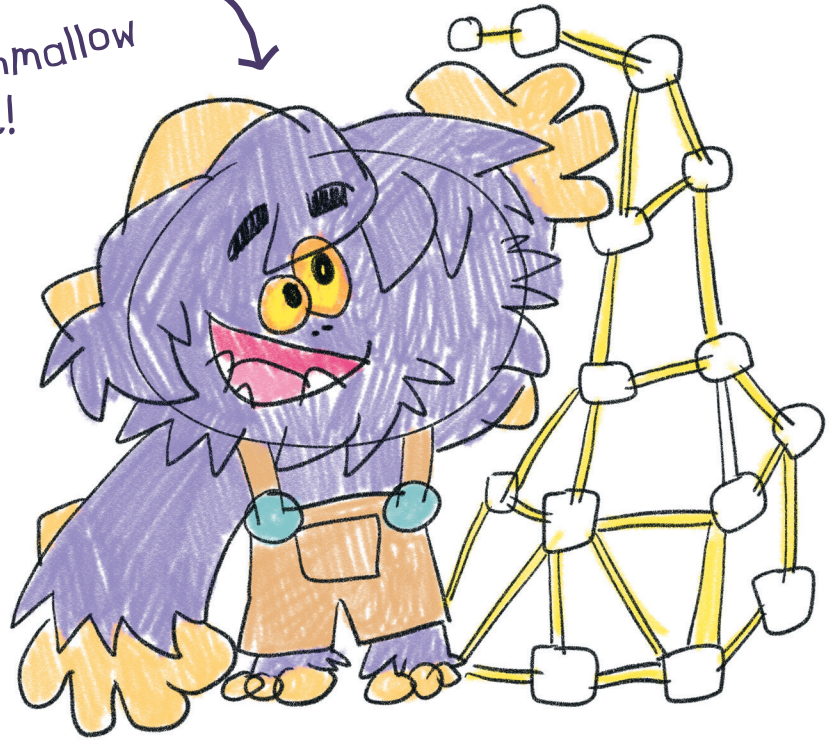
## CHAPTER 16

- Standard deck of playing cards

Grogg (me)

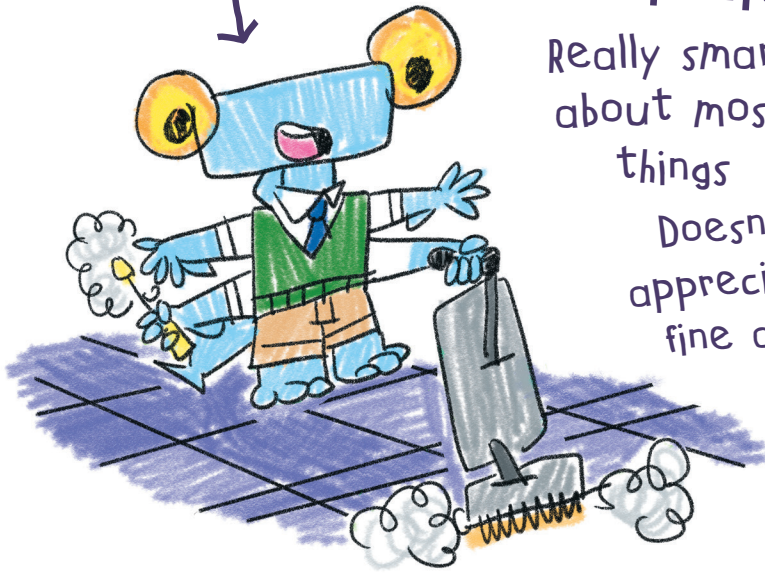
Built a spaghetti-and-marshmallow  
tower taller than me!

(Works best with uncooked  
ingredients)



Alex

His room is waaaaay  
cleaner than mine  
makes neat vacuum  
patterns in his rug



Winnie

Really smart  
about most  
things  
Doesn't  
appreciate  
fine art



This does NOT  
look like me!

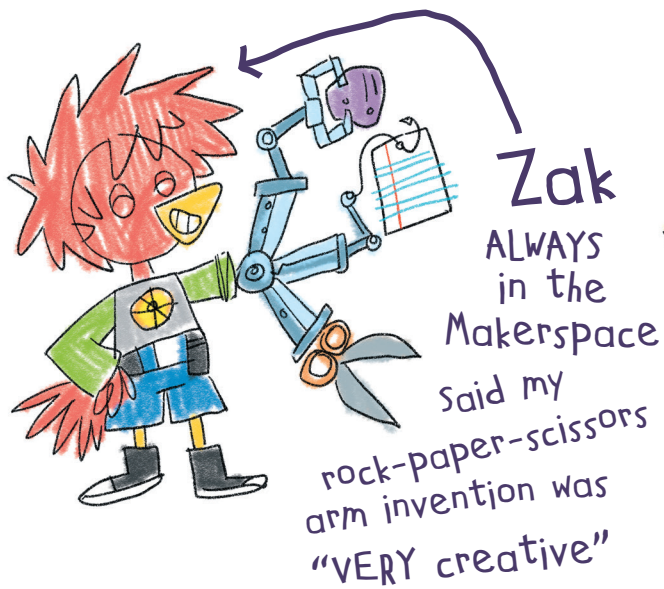
Lizzie

Loves to read  
writes book reviews on her own  
SCALES TALES website

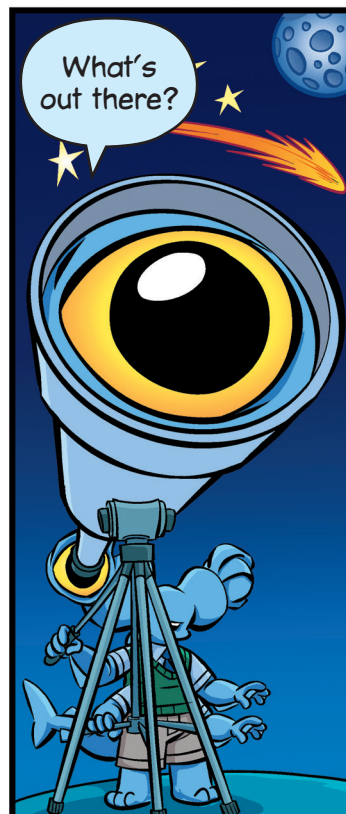
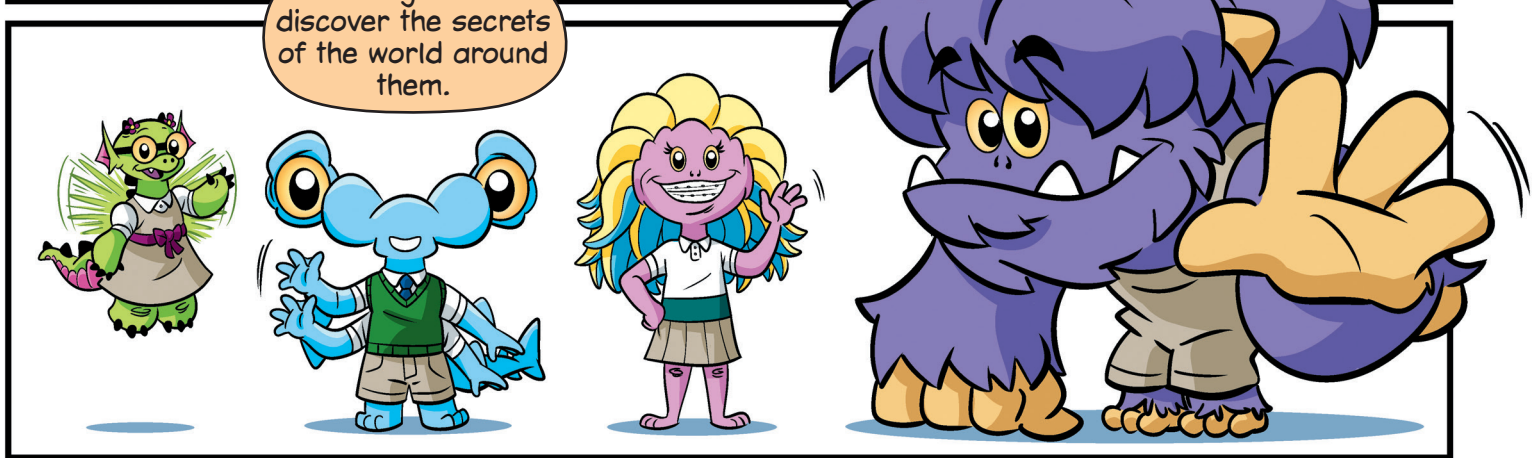
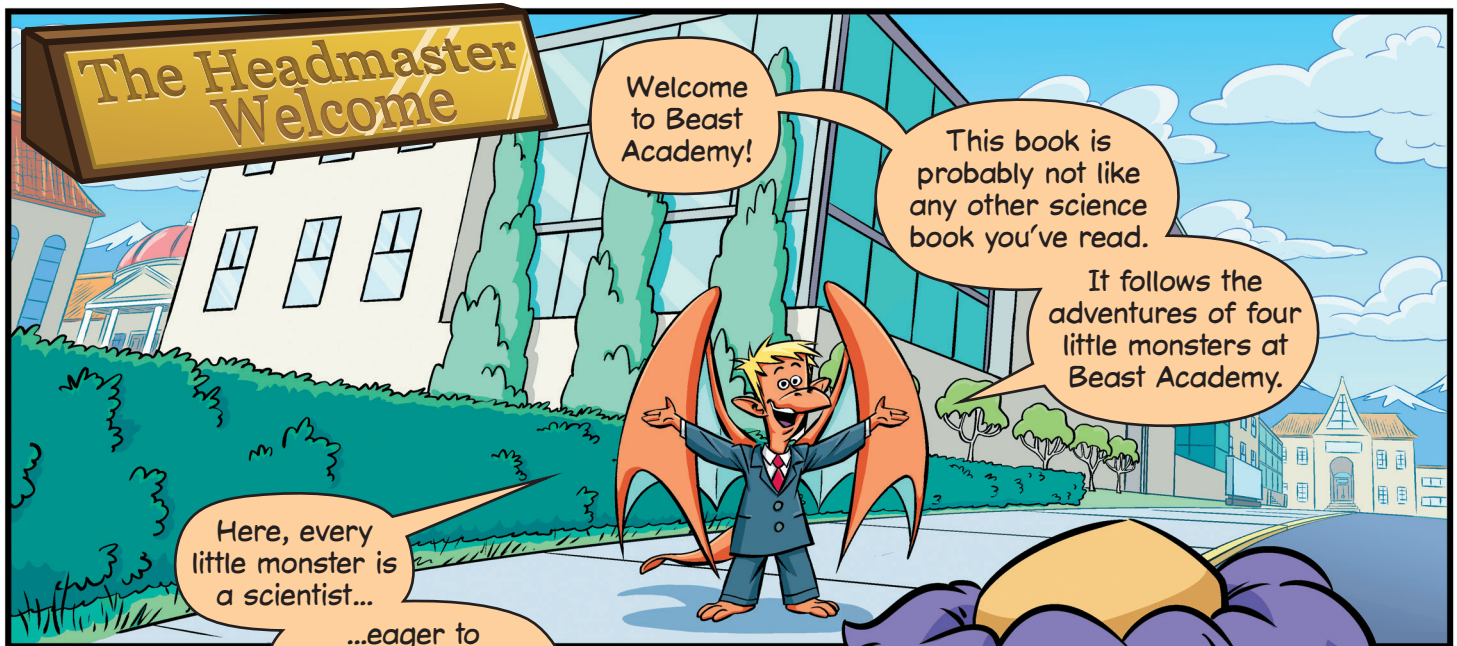


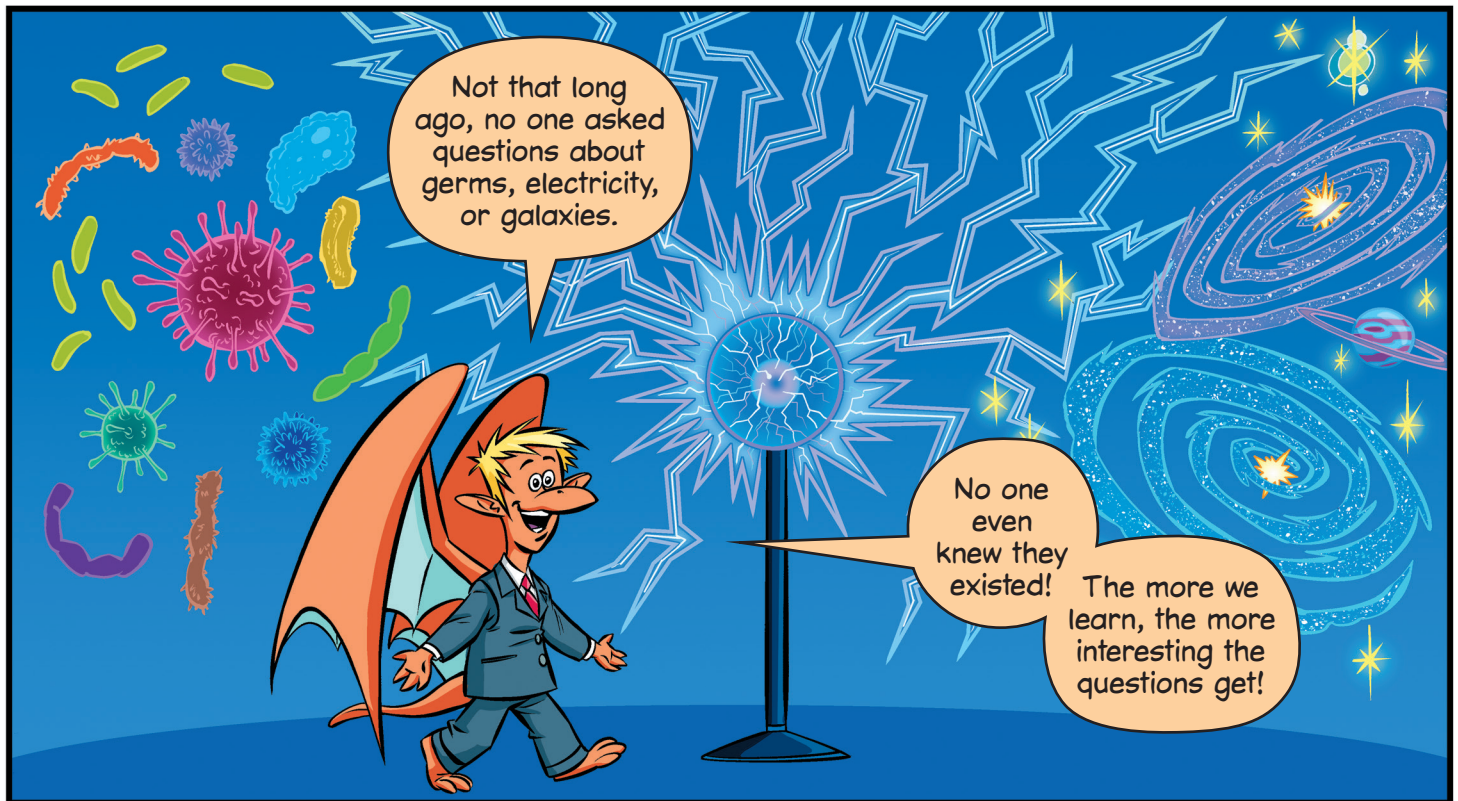
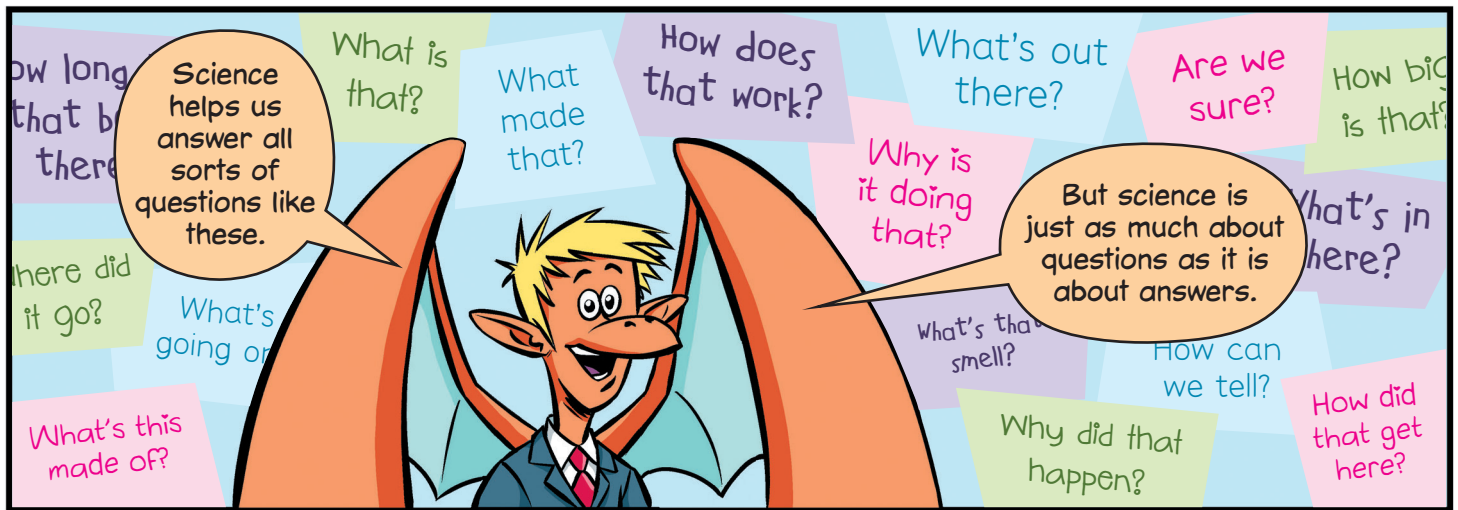


**Ms. Y.**  
Has the world's  
second-biggest  
collection of sand-filled  
bottles!



**R&G**  
School  
custodian(s)  
totals:  
1 tail  
2 heads  
3 eyes  
4 arms





THE BEAST ACADEMY WORLD WORKS JUST LIKE OURS. THE CREATURES MAY LOOK DIFFERENT, BUT THE WAY THINGS WORK AND WHAT THEY'RE MADE OF ARE THE SAME AS HERE ON EARTH!