

On Level



SCIENCE • GRADE 5

California Content Standards

Earth Sciences: 3.A

Earth Sciences: 3.B

Earth Sciences: 3.C

Earth Sciences: 3.D

Earth Sciences: 3.E

Earth's Water

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•
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•
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English-language
Arts Activities

Earth's Water

California's Content Standards Met

GRADE 5 SCIENCE

EARTH SCIENCES: 3—Water on Earth moves between the oceans and land through the process of evaporation and condensation. As a basis for understanding this concept:

- a. Students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.
- b. Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.
- c. Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.
- d. Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.
- e. Students know the origin of the water used by their local communities.

GRADE 5 ENGLISH LANGUAGE ARTS

1.0 WORD ANALYSIS, FLUENCY, AND SYSTEMATIC VOCABULARY DEVELOPMENT

Vocabulary and Concept Development 1.3—Understand and explain frequently used synonyms, antonyms, and homographs.

2.0 READING COMPREHENSION

Comprehension and Analysis of Grade-Level-Appropriate Text 2.3—Discern main ideas and concepts presented in texts, identifying and assessing evidence that supports those ideas.

Comprehension and Analysis of Grade-Level-Appropriate Text 2.4—Draw inferences, conclusions, or generalizations about text and support them with textual evidence and prior knowledge.

Comprehension and Analysis of Grade-Level-Appropriate Text 2.5—Compare and contrast information on the same topic after reading several passages or articles.

On Level



SCIENCE • GRADE 5

California Content Standards

Earth Sciences: 3.A

Earth Sciences: 3.B

Earth Sciences: 3.C

Earth Sciences: 3.D

Earth Sciences: 3.E

Student Book

Earth's Water

Print pages 5 – 18 of this PDF for the student book.

How to Make the Student Book

- The student book is contained on pages 5–18 of this PDF. It begins on the next page.
- To make one student book, or a two-sided master copy that can be photocopied, you will print on both sides of seven sheets of 8.5" x 11" paper.
- Do a test printout of one book first to familiarize yourself with the procedure.
- Follow these instructions carefully.

First—Select the Paper

Since you will be printing on both sides of the sheets of paper, select a good quality white paper. We recommend using at least a 22lb sheet.

Second—Check Printer Settings

Be sure you have the correct page setup settings for your computer and printer. You will print these pages in landscape format.

Third—Print EVEN Pages

Open the PDF of the book you want to print. Select print from your file menu. In your printer's dialogue box enter pages 5–18 to print. Then select EVEN pages only. It is important to print only the EVEN pages first. Click "Print" to print the even pages. (**Important note:** The first page that prints will be blank. DO NOT discard this page. It will be needed to print the cover in the next step.)

Forth—Print ODD Pages

When the even pages have printed, flip the stack of pages over to print the odd pages. Place the stack back in your printer. Select print from the file menu again. In your printer's dialogue box, select ODD pages. Click "Print" to print the odd the pages.

Fifth—Fold the Book

You now have a complete book. Check to be sure the pages are in the correct order with the book's cover as the top page. Then fold the stack of paper in half.

Sixth—Staple the Book

Use an extended-length stapler to staple the pages together. Place three staples in the spine of the book.

Please note that printers vary in how they output pages. Do a test printing with one book and adjust the procedure as necessary.

If you want to make a one-sided master copy, print ALL pages 5–18 at once. Then select "one-sided to two-sided" on the copy machine.

Earth's Water

California's Content Standards Met



GRADE 5 SCIENCE

EARTH SCIENCES: 1—Water on Earth moves between the oceans and land through the process of evaporation and condensation. As a basis for understanding this concept:

- a. Students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.
- b. Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.
- c. Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.
- d. Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.
- e. Students know the origin of the water used by their local communities.

GRADE 5 ENGLISH LANGUAGE ARTS

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SCIENCE • GRADE 5

California Content Standards

Earth Sciences: 3.A, 3.B, 3.C, 3.D, 3.E

Earth's Water

by
Caitlin Scott





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*What do you think you will
learn from this book?*

INTRODUCTION

The Blue Planet

Because water covers three-fourths of Earth's surface, our planet is sometimes referred to as the blue planet. Fresh water falls in many forms on land and oceans alike. When water falls on land, it dissolves salts and minerals found on the surface of Earth. Water then carries these salts and minerals to the oceans.

When water **evaporates** from the surface of the oceans, the salts remain behind. For this reason, the oceans have become salty. Did you know that water in the oceans is 220 times saltier than the water in fresh lakes and rivers? Why is that?

evaporate: to change from a liquid to a vapor or gas

Water in rivers and lakes is constantly moving. For example, water from rain and snow that falls on the Rocky Mountains flows into streams and lakes. The water from these streams and lakes then flows into the Colorado River. The Colorado River transports the water to the Gulf of California.

Because there is both an inflow of water and an outflow of water salts and minerals are not trapped. Once the water reaches the ocean, the salts and minerals become trapped. There is no outflow from the ocean. Over millions of years, this salt and minerals built up.

Ninety seven percent of the water on Earth is too salty to drink. That is why it is important to protect and conserve fresh water. Fortunately, water is a renewable resource because of the water cycle. Read on to learn more about this life-saving cycle.

The Water Cycle

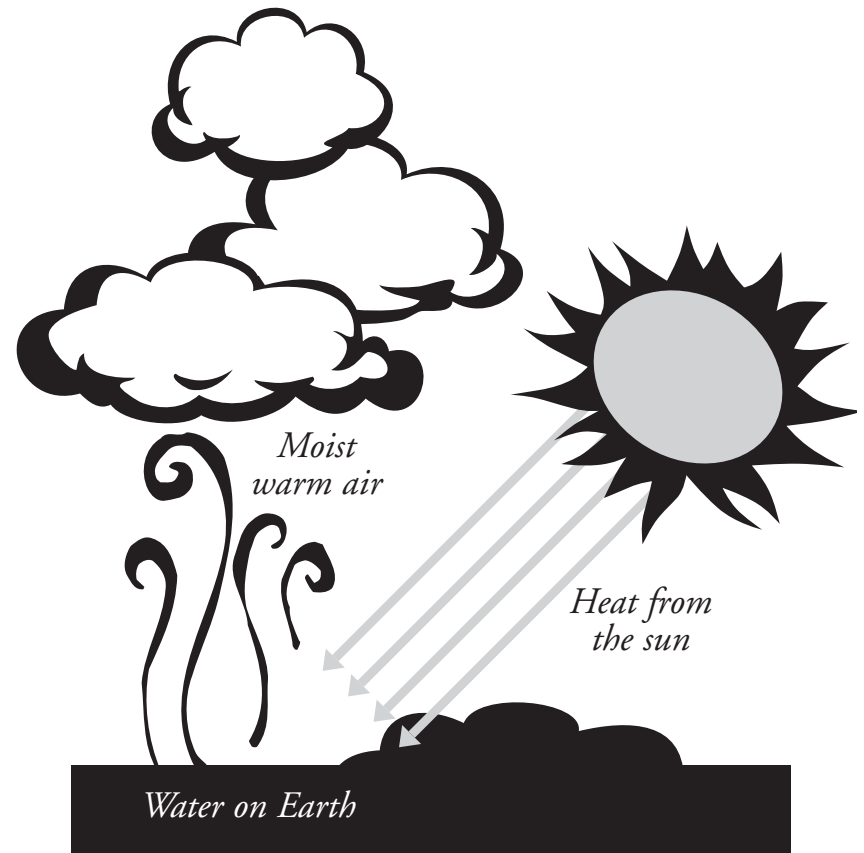
Air is all around us. We can't see air, but we know it is there. We breathe it every day. Air is made of **gases**. It also contains water **vapor**. How do we know? Look at a cloud. Did you know a cloud is just water in the air?

When water is warmed by the sun, it evaporates and rises. As water vapor rises, it cools and tiny water drops form. When these drops are packed close together, we can see them. They form a cloud. When too much water collects in a cloud, the water falls.

Water goes up into the air and falls back to Earth all the time. This is called the water cycle.

gases: matter that has no shape; gases spread out to fill the space around them; most cannot be seen

vapor: a gas formed from something that is usually a liquid



Clouds form when warm, moist air rises off Earth's surface.

The water cycle has four parts.

Evaporation—The sun warms water on Earth. The water changes to a gas and rises.

Condensation—The warm gas rises and moves over land. The air cools and the gas begins to change back to a **liquid**. Tiny water droplets form clouds.

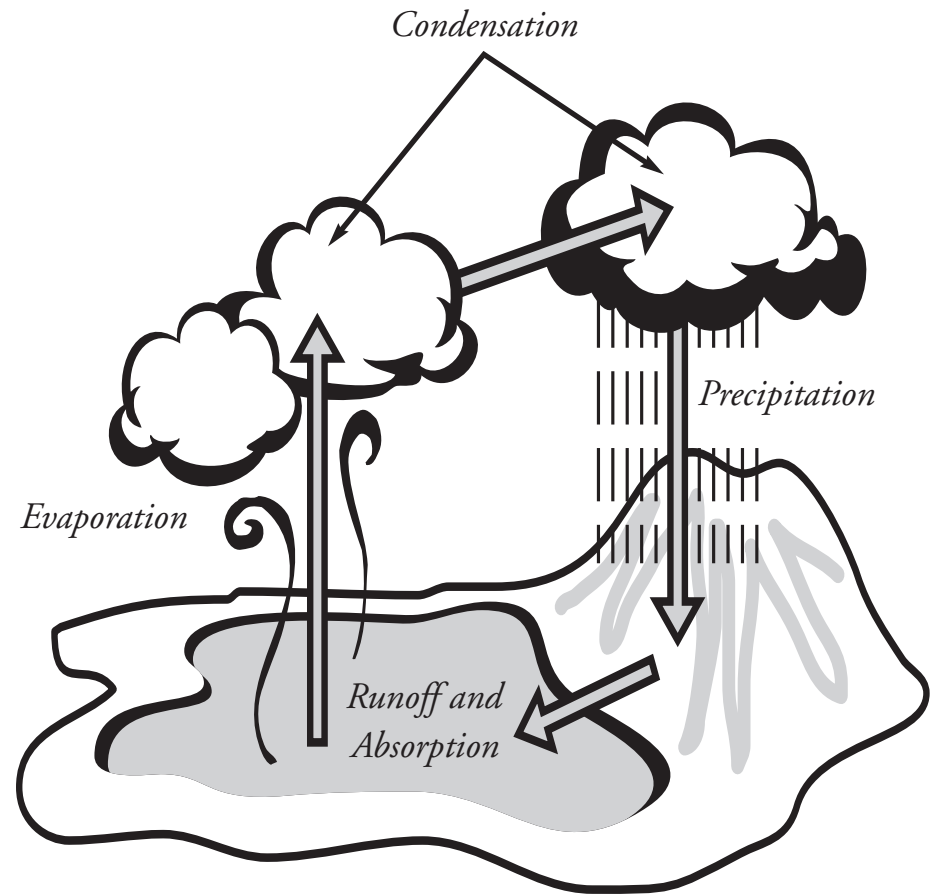
Precipitation—More and more water collects in the cloud. When there is too much water, it falls back to Earth as rain, snow, sleet, or hail.

Runoff and Absorption—The water that falls collects on Earth. Some is absorbed into the ground.

Can you guess what happens next?
Evaporation. The cycle starts all over again.

liquid: a state in which matter flows freely when poured; liquids take the shape of whatever holds them

Water Cycle



Describe how water exists in the air in different forms.

Evaporation

Evaporation occurs when water is warmed by the sun. The water changes from a liquid to a gas. As a gas, water moves up into the air.

Have you ever spilled water on your clothes? Did the water spot go away? Yes. Your clothes dried out. The water changed from a liquid to a gas. It evaporated. But you didn't see the water going into the air.

If it doesn't rain for a while, the ground gets dry. Why? Because the water evaporates. Even though you can't see it, water evaporates all the time.

Have you seen a pot of boiling water? You see steam rising out of the pot. First water changes from a liquid to a gas. Then a cloud forms. This is called condensation. Read on to learn more.

Explain what causes evaporation.



*When water boils, it turns from a liquid to a gas.
You can see the gas as steam.*

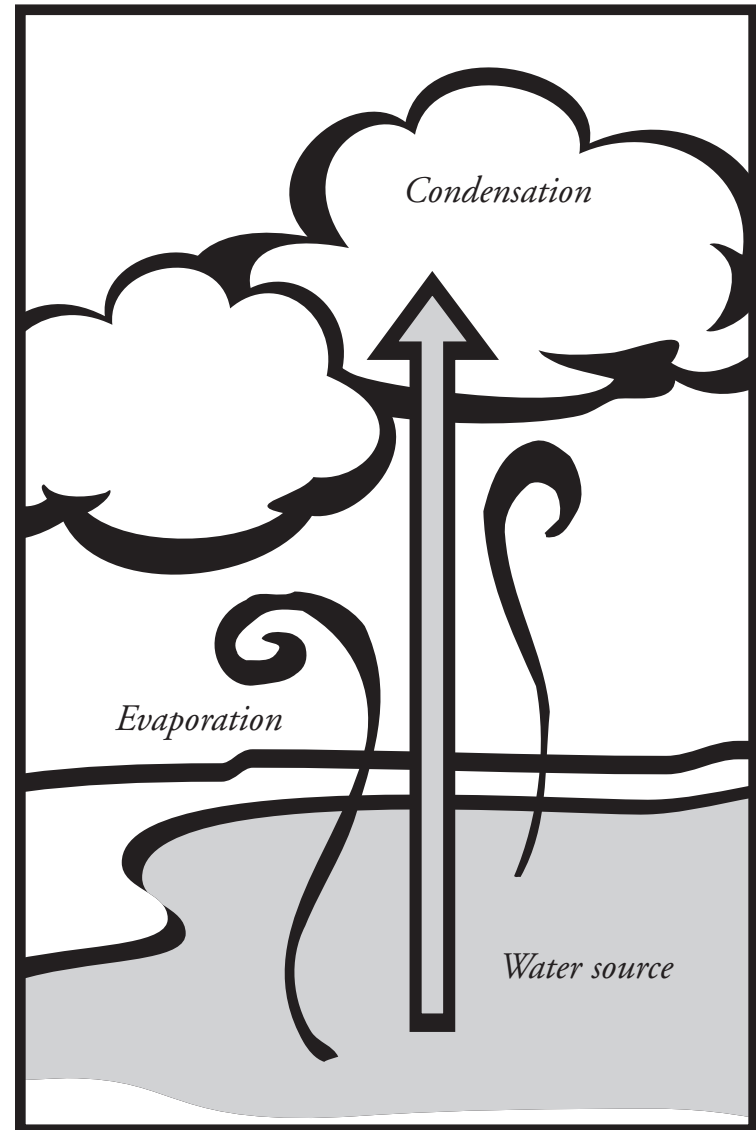
Condensation

Have you ever breathed on a cold window? Your breath made fog on the window. This is condensation.

Have you noticed what happens when someone with glasses goes from the cold outside to the warm inside? Their glasses fog up. This is also condensation.

Condensation takes place when water in the air forms tiny water drops. The water is changing back from a gas to a liquid. It is an important part of the water cycle. First water evaporates. Then it condenses. The condensation forms clouds.

What happens next in the water cycle? Water falls back to Earth.



Explain what happens when water condenses.

Precipitation

As the clouds move higher, they get colder and more gas becomes liquid. The liquid water is heavier than water vapor. It falls back to Earth.

Rain

If it is warm outside, the water that falls is rain. Rain occurs at temperatures that are above freezing. This means greater than 32 degrees Fahrenheit or 0 degrees Celsius.

In some parts of the United States, it rains a lot. In other parts, it is very dry.

Average Rainfall in U.S. Cities	
City	Average Annual Rainfall in Inches
Astoria, Oregon	70
El Paso, Texas	8
Las Vegas, Nevada	4
Miami, Florida	60
New Orleans, Louisiana	60
Phoenix, Arizona	7

Snow

Snow is water that freezes in a cloud. As it falls to the ground, it stays frozen. Because snow freezes in a cloud and stays frozen as it falls, each flake has a beautiful pattern. The patterns are created by the air that mixes with the cloud when the snowflake freezes.

It snows a lot in the northern parts of the United States. It also snows a lot high up in the mountains.

Snowiest U.S. Cities	
City	Average Annual Snowfall in Inches
Blue Canyon, California	241
Marquette, Michigan	129
Sault Ste. Marie, Michigan	117
Syracuse, New York	112
Caribou, Maine	110

Why do scientists keep track of precipitation records?

Sleet

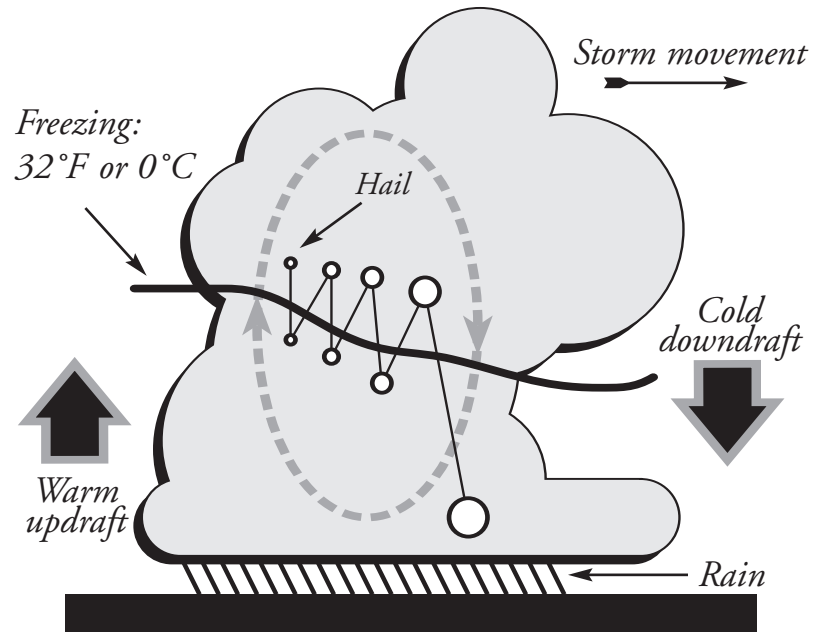
Sleet is also water that freezes in a cloud. But, sleet doesn't stay frozen. It passes through warmer air and melts as it falls. Then it goes through colder air again. It refreezes just before it hits the ground.

Hail

Hail is a little like sleet. Water drops freeze in a cloud and fall to warmer air. The water starts to melt. But then, strong winds from a **thunderstorm** blow it back up to the colder air. It collects dust and ice from the cloud and freezes again. The frozen water falls again and the wind may blow it up again. This can happen many times. Each time, the frozen water gets larger. Finally, it gets too heavy to stay up and falls to the ground as hail.

thunderstorm: a rainstorm that has thunder and lightning

How Hail Forms



Hail moves up and down in a storm cloud. It grows larger and larger each time it passes through air that is above and below freezing.

Describe how water changes from one state to another.

Runoff and Absorption

The last step of the water cycle is runoff and absorption. When water falls to the ground, it is collected and stored until it evaporates again.

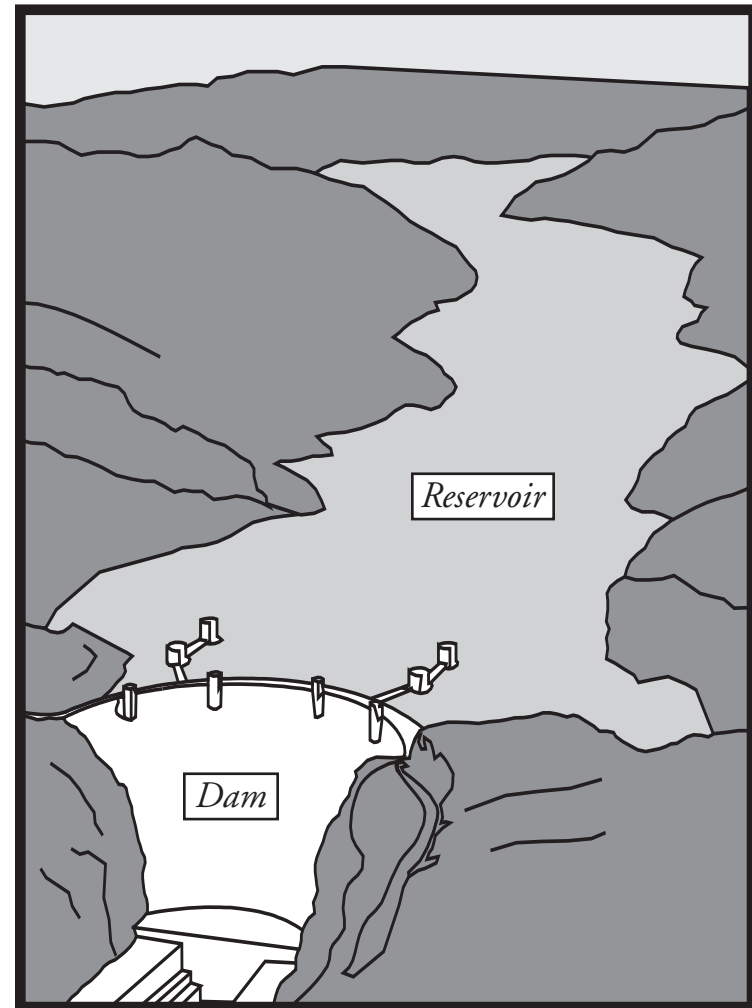
Where can you see water stored on Earth? The first place you think of might be a lake, a river, a sea, or the oceans.

Water is also stored underground. After a hard rain, the ground is damp and muddy. The ground is storing water. Water can even form underground lakes or streams.

Sometimes people build **reservoirs** to collect and store water. Then they clean the water and use it for drinking, cooking, and cleaning. Lake Mead is the biggest man-made reservoir in the United States. It is about 110 miles long.

*Where does the water in your community come from?
Where is it stored?*

reservoirs: places where water is stored



Lake Mead in Nevada is a reservoir created by the Hoover Dam.

Protecting Our Water Supply

The water cycle has been going on as long as Earth has been around. The water in your glass once fell as rain. The rain that falls today has been around since the time of the dinosaurs. The water cycle is going on right now, right this very minute. We can't live without it.

You've learned that Earth's water exists in the form of ice, snow, freshwater lakes, streams, and groundwater. Clean, fresh water is a basic need of life. Life cannot exist without it.

Since so little water on Earth supports life, we must protect our water supply. This means being careful about what we put into our water.

In California, the water supply depends on the annual rainfall and snowpack in the mountains. This water collects in watershed districts, underground, and in lakes, rivers, and streams. If these areas are disturbed, the quality of our water can be affected.

For example, runoff of chemicals used in farming near these water sources can pollute the water. Runoff of chemicals and other pollutants from city streets can also pollute the water.

For these reasons, local, state, federal, and global laws have been passed to manage and protect water resources. These laws are an important step. However, preserving our water supply is the responsibility not only of governments, but also of each one of us.

What does your community do to protect the water supply?

Glossary

evaporate—to change from a liquid to a vapor or gas

gases—matter that has no shape; gases spread out to fill the space around them; most cannot be seen

liquid—a state in which matter flows freely when poured; liquids take the shape of whatever holds them

reservoirs—places where water is stored

thunderstorm—a rainstorm that has thunder and lightning

vapor—a gas formed from something that is usually a liquid

To Find Out More . . .

Want to learn more about Earth's water?

Try these books

A Drop Around the World by Barbara McKinney Shaw. Dawn Publications, 1998.

The Magic School Bus Wet All Over by Pat Relf and Carolyn Bracken. Scholastic, 1996.

Access these Web sites

The National Weather Service
<http://www.nws.noaa.gov/>

The Environmental Protection Agency,
Office of Water
<http://www.epa.gov/water/>

Write for more information

The National Weather Service
1325 East West Highway
Silver Spring, MD 20910

U.S. Environmental Protection Agency
Office of Water (4101M)
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

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ENGLISH-LANGUAGE ARTS • GRADE 5

On Level

California Content Standards
Vocabulary and Concept Development: 1.3
Comprehension and Analysis of Grade-Level-Appropriate Text: 2.3
Comprehension and Analysis of Grade-Level-Appropriate Text: 2.4
Comprehension and Analysis of Grade-Level-Appropriate Text: 2.5

English-language Arts Activities

Earth's Water

Print pages 20–24 of this PDF for the reading activities.

Summarize

TRY THE SKILL

Summarizing means retelling what you have read. Summaries are often shorter than the text you read. Summarizing helps you understand what you read.

Read this paragraph and try summarizing it.

Clouds don't have to be high up in the sky. Sometimes clouds can touch the ground. We call these clouds fog. Fog often occurs in the morning in places near a large body of water—such as a bay or lake. Fog can also occur in valleys when heavy cold air sinks into a valley and warmer air passes over it on top.

Is this a good summary?

Fog often occurs in the morning.

No! This statement is too specific and does not summarize the main idea. How about the one below?

Is it a good summary?

Clouds that are close to the ground are called fog.

Yes! This is the main idea of the paragraph.

Read the paragraphs. Shade the circle next to the best summary.

1. Air rises and falls. As air rises, tiny water drops form. When these drops are close together, we can see them. They form a cloud. A cloud is really just water in the air.
 - Ⓐ Air is made of oxygen and hydrogen.
 - Ⓑ Water in the air forms clouds.
 - Ⓒ Rain is important for plants.
2. Snow is water that freezes in a cloud. As it falls to the ground, it stays frozen. Because snow freezes in a cloud and stays frozen, each flake has beautiful patterns. The patterns are created by the air that mixes with the cloud when the snowflake froze.
 - Ⓐ Each snowflake had a beautiful pattern.
 - Ⓑ Snowflake patterns are created by the air in the clouds.
 - Ⓒ Snow freezes in a cloud and stays frozen as it falls.

Draw Conclusions

TRY THE SKILL

Charts can give you information quickly. You can draw conclusions from charts. Read the chart from *Earth's Water*.

Snowiest U.S. Cities

City	Average Annual Snowfall in Inches
Blue Canyon, California	241
Marquette, Michigan	129
Sault Ste. Marie, Michigan	117
Syracuse, New York	112
Caribou, Maine	110

Here are some conclusions you can draw from the chart.

- The snowiest cities in the U.S. get more than 100 inches of snow. That's a lot of snow.
- Two of the snowiest cities are in Michigan, so Michigan probably gets a lot of snow.
- Not all the snowiest cities are in the same state, so there can be heavy snowfall in many different parts of the U.S.

Read the chart from *Earth's Water*. Think about the conclusions you can draw. Write them on the lines.

Average Rainfall in U.S. Cities

City	Average Annual Rainfall in Inches
Astoria, Oregon	70
El Paso, Texas	8
Las Vegas, Nevada	4
Miami, Florida	60
New Orleans, Louisiana	60
Phoenix, Arizona	7

Compare and Contrast

TRY THE SKILL

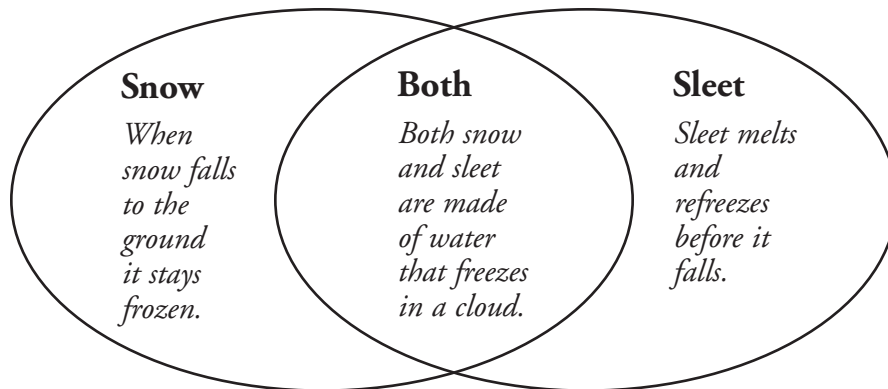
Comparing and contrasting can help you understand what you read.

- **Comparing** tells how things are alike.
- **Contrasting** tells how things are different.

Read these paragraphs from *Earth's Water*. Then, read the Venn diagram that compares and contrasts.

Snow is water that freezes in a cloud. As it falls to the ground, it stays frozen. Because snow freezes in a cloud and stays frozen as it falls, each flake has a beautiful pattern.

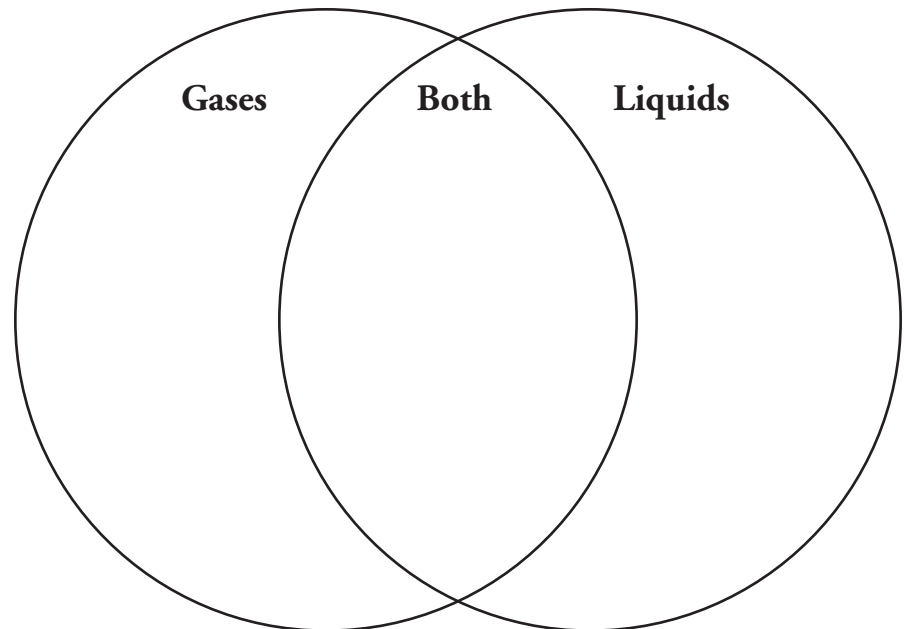
Sleet is also water that freezes in a cloud. But, sleet doesn't stay frozen. It passes through warmer air and melts as it falls. Then, it goes through colder air again. It refreezes just before it hits the ground.



Read the paragraphs. Think about comparing and contrasting. Then complete the Venn diagram.

Gas is a state of matter. Most gases have no shape. They spread out to fill the space around them. Most cannot be seen.

Liquid is also a state of matter. Liquids flow freely when you pour them. They take the shape of whatever holds them.



Antonyms

TRY THE SKILL

Antonyms are words that have opposite meanings. Some examples of antonyms are:

night and *day*
up and *down*
inside and *outside*
left and *right*

Read the paragraph from *Earth's Water*. Look for the antonyms.

When air is warmed by the sun, it rises. As air rises, it cools and tiny water drops form. When these drops are packed close together, we can see them. They form a cloud. When too much water collects in a cloud, the water falls.

***Rises* and *falls* are antonyms. Here is another. Look for the antonyms.**

Rain, snow, sleet, and hail are all forms of precipitation. Remember, precipitation can occur in liquid or solid forms.

***Liquid* and *solid* are antonyms.**

1. Read the paragraph from *Earth's Water*. Circle the antonyms.

Sleet is also water that freezes in a cloud. But sleet doesn't stay frozen. It passes through warmer air and melts as it falls. Then it goes through colder air again. It refreezes just before it hits the ground.

2. Read the paragraph. Circle the antonyms.

You know that water goes up into the air and forms clouds and fog. Water also falls down from the sky as rain, snow, sleet, or hail.

3. Think of as many antonyms that have to do with weather as you can. Write them on the lines.

Answer Key

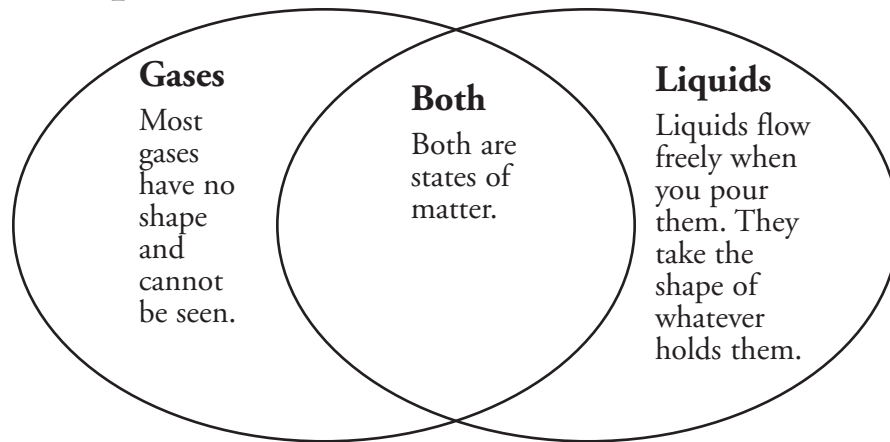
Summarize

1. B
2. C

Draw Conclusions

Conclusions will vary but should be based on information from the chart.

Compare and Contrast



Antonyms

1. warmer/colder, frozen/melts
2. goes up/falls down
3. Answers will vary.