Name: _____ #: _____

Water Sources

STEMscopes:
Water can be found almost everywhere on Earth covering 71% of Earth's surface. It is in the atmosphere, in bodies of water both fresh and saline, in living organisms, and in the upper layers of Earth's crust (its solid surface layer). Ninety-seven point f ve percent of the water on Earth is saltwater; only 2.5% is the fresh water that organisms that do not live in the oceans can use to survive. Most of the freshwater is in the form of glaciers and ice caps (68.7%) leaving about 30% as groundwater. Freshwater found in lakes and rivers is what non-oceanic organisms use to meet their needs.

Standards that will be addressed:

- **5-ESS2.C.1:** The Roles of Water in Earth's Surface Processes: Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.
- **5-ESS2.2:** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Remember to look at the Science tab on our class website for additional resources, information, and updates.

What's Included in the Packet:

1. Investigative Phenomena
2. Accessing Prior Knowledge
3. Do 2: Where is the Water?
    a. Graphs
    b. Student CER
4. STEMscopedia
5. Graphic Organizer
6. Main Ideas and Details
7. Roundtable Review
8. Content Connection Videos:
    a. Underground Caves
    b. Glaciers 1
    c. Glaciers 2
9. Science Today- Demand for Drinking Water
10. Independent Practice
    a. Secret Word
    b. Break the Code
11. Concept Attainment Quiz

Test Date:_____

Investigative Phenomena

Name: _____ Date: _____

Student Wondering of Phenomena: How much of Earth's surface is covered by water?

Record your thoughts about the Student Wondering of Phenomena question in the boxes below.

Before Instruction	During Instruction (Refine your thoughts as you learn more throughout the scope.)	After Instruction

Accessing Prior Knowledge

Name: _____ Date: _____

Water Sources

Circle the statement you agree with most. When directed, join the others in your class who have made the same selection. Explain why you chose the statement you did in the blank box provided. After hearing the other groups, did you feel compelled to choose another statement?

Fresh water is found mostly in oceans.
–Gloria

Fresh water is found mostly in lakes and rivers.
–Craig

Fresh water is found mostly underground and in glaciers.
–Alex

Reasons

Explore

Name: _____ Date: _____

Where Is the Water?

Use the data from the index cards to create a bar graph that represents all the sources of Earth's water. Label the graph. Be sure to include the amount and percentage of water within each reservoir.

Title: _____

What is the difference between salt water and fresh water?

_____

_____

Where is the largest supply of water on Earth?

_____

_____

Why do humans need fresh water?

_____

_____

Explore

Use the data from the index cards to create a bar graph that represents all the sources of Earth's water. Label the graph. Be sure to include the amount and percentage of water within each reservoir.

Title: _____

Where is the largest supply of fresh water?

_____

_____

Are we able to use the fresh water that is frozen in the glaciers?

_____

_____

Which source of fresh water is easiest for us to access?

_____

_____

Explore

Name: _____ Date: _____

Where Is the Water?
Claim-Evidence-Reasoning

Prompt

Jimmy volunteered to pick up litter from the local creek. He claims it is very important to protect streams and rivers from becoming polluted. Do you agree? Using scientific reasoning, write a scientific explanation that explains why you agree or disagree with Jimmy. Use data from the activity as your evidence.

Claim:

_____

_____

Evidence:

_____

_____

_____

_____

Reasoning:

_____

_____

_____

_____

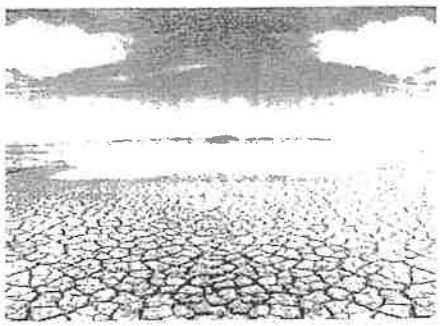
_____

Water Sources

Reflect

Have you ever wondered from where your next drink of water will come? Most likely, you have never thought about it. It is easy to grab a glass and fill it up at the sink or the fridge. Drinking fountains are found in almost every hallway of your school, and taking a shower is probably a daily task for you.

Despite the fact that the majority of Earth is covered with water, many places face water shortages.

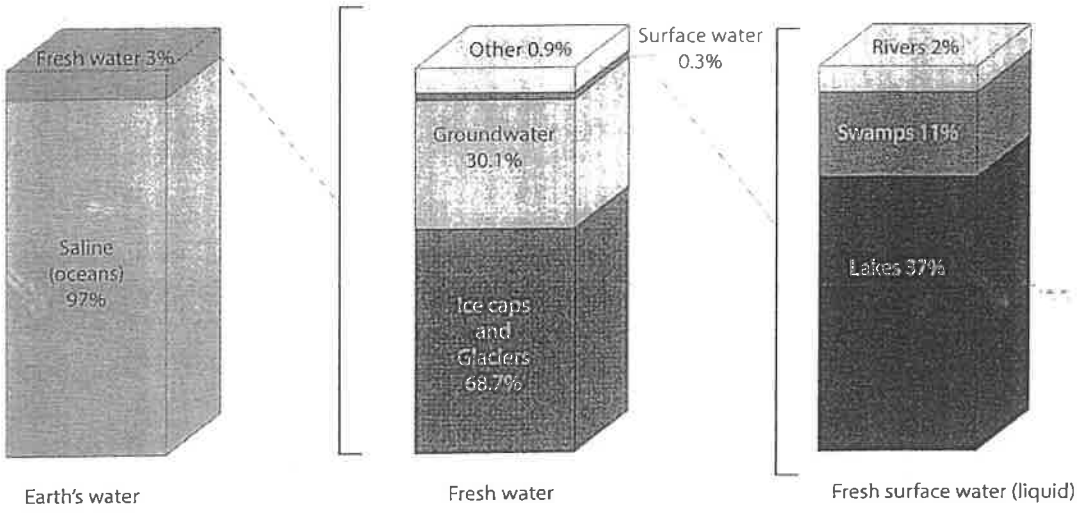


Parts of our world are not as fortunate. South Africa is facing a water shortage crisis due to climate change and weather patterns. A shortage of fresh water can lead to diseases and economic problems.

Where can we find water on Earth?

Almost 71% of Earth's surface is covered in water. It is in oceans, lakes, rivers, streams, glaciers, and ice caps. It is in our bodies, in animals, in plants, and in foods. With so much water available, it seems that no one should face a shortage! However, the large majority of water on Earth is not safe for drinking. Look at the different sources that make up Earth's water supply. There are two different types of water—fresh water and saline water (or salt water).

Distribution of Earth's Water



From US Geological Survey

What Do You Think?

Look at the following table that further shows how water is distributed on Earth, then answer the questions below.

Water Source	Water Volume (km^3)	Percentage of Total Water
Oceans and seas	1,338,000,000	96.5%
Glaciers and ice caps	24,064,000	1.74%
Groundwater	23,400,000	1.7%
Permafrost	300,000	0.02%
Lakes	176,400	0.01%
Soil moisture	16,500	0.001%
Atmosphere	12,900	0.001%
Wetlands	11,470	0.001%
Rivers	2,120	0.0002%
Biological	1,120	0.0001%
TOTALS	**1,386,000,000**	**100%**

Questions:

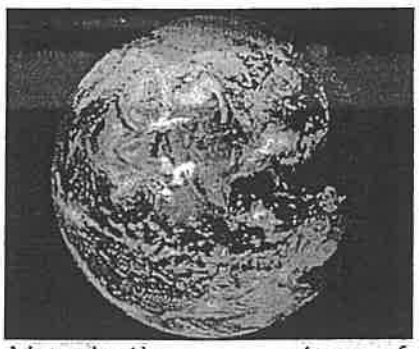
- Make a bar graph, using each category listed in the table to show how water is distributed on Earth.
- Does the data surprise you? Why?
- Does the information change the way you think about water usage? How?

Reflect

Fresh water is classified as water having less than 0.1% salt concentration. Of the fresh water on Earth, 70% is in the form of glaciers and ice caps. About 30% of fresh water is groundwater. Fresh water that is surface water is what organisms use to meet their needs. It is used for drinking, transportation, heating and cooling, industry, recreation, and other purposes. We use fresh water for many things. It is important for us to be mindful of how much we use. We need to conserve our freshwater supply.

Salt Water

Of Earth's water, 97% is salt water. Most of the salt water is found in the oceans, all of which are connected. They cover about 70% of Earth's surface. Some salt water exists in the form of saltwater lakes, such as the Great Salt Lake in Utah and many lakes in China. Although salt water provides a habitat for many marine organisms, we cannot drink it.

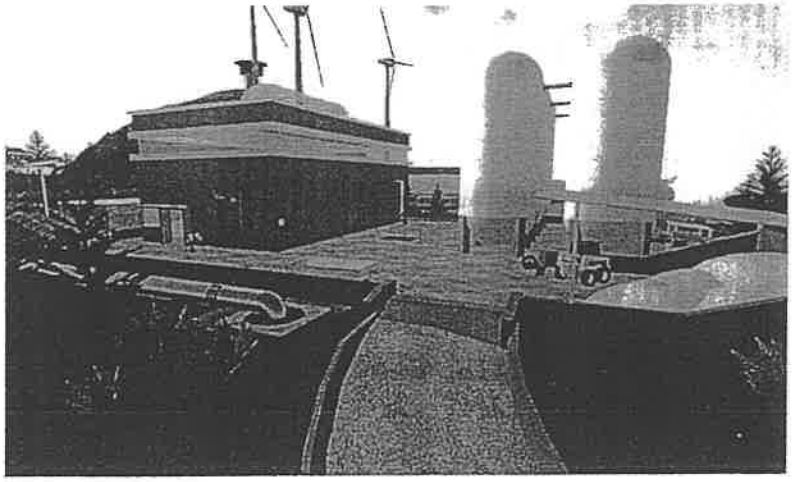


Nearly three-quarters of earth's surface is covered in water. Salt water is 97% of that. Only 3% is fresh water.

What Do You Think?

Because 97% of Earth's water is salt water and undrinkable, many people have attempted to find ways to turn ocean water into drinking water. Scientists call this process *desalination*.

Look at the example below of machinery used for the desalination of water, then answer the questions about it.



A desalination plant takes salt water and removes the salt and other minerals to make the water potable (drinkable) for people and animals.

Questions:

- Based on what you know about the evaporation of seawater, how do you think desalination works?
- What are some benefits of building desalination plants?
- What are some drawbacks of building desalination plants?
- Where on Earth should these plants be built?

Reflect

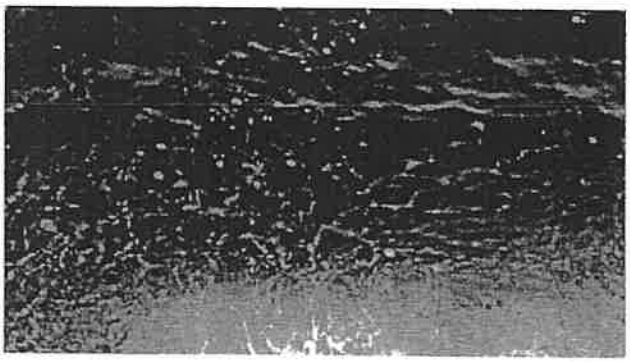
Fresh Water

Although 3% of Earth's water is fresh water, a large percentage of that water is actually unusable. Look back at the water distribution data. What do you notice about the freshwater portion of Earth's water supply?

Ice

Almost 69% of fresh water on Earth is stored in the form of ice caps and glaciers. The continent of Antarctica and the island of Greenland are large land areas that are almost completely covered with ice. Water locked up in glaciers and ice caps cannot be used by humans as a drinking water supply. However, that water still plays an important role in the scientific world. Scientists monitor climate change and its effects on our world by observing these large areas of ice.

The majority of fresh water is frozen in glaciers and polar ice caps.



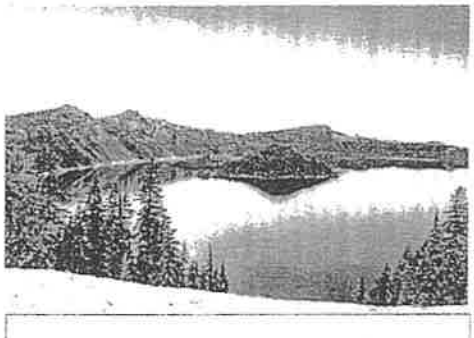
aquifer – a body of rock that can hold water underground and that allows water to flow through it

Groundwater

Of the fresh water on Earth, 30% exists as groundwater. Groundwater is any water that lies underneath the surface of the land. Groundwater is essential to life on Earth and is an important part of the water cycle. A lot of precipitation that falls to Earth soaks into the soil and trickles through the ground until it collects in **aquifers**. Aquifers are used as sources of drinking water for people and animals. Farmers use aquifers to water their crops.

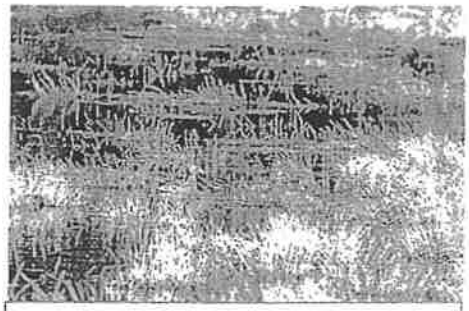
Surface Water

The remaining 0.3% of Earth's fresh water is surface water. Surface water is any water on top of the land. Most of this water is in the form of lakes, rivers, and marshes. *Lakes* are bodies of water that are completely surrounded by land and not connected to an ocean. Most lakes have rivers connected to them that allow water to move in and out. *Rivers* are natural, flowing sources of water. Rivers move from higher elevations to lower elevations. Smaller rivers act as tributaries to larger rivers. Most larger rivers eventually empty into larger bodies of water, such as oceans or lakes. Smaller rivers may be called *brooks*, *creeks*, or *streams*. *Marshes*, or *wetlands*, are shallow areas where land and water meet. A wetland is flooded the majority of the time.



Lakes are large bodies of fresh water.

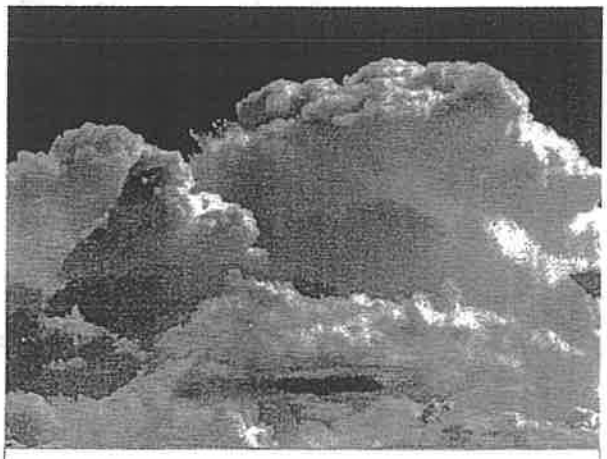
Rivers are another example of freshwater surface water.



Wetlands are important because they filter, clean, and store water.

Water in the Atmosphere

A small percentage of water is always present in the atmosphere. Water evaporates when it has enough energy to leave its liquid form and become a gas called *water vapor*. The warmer the air is, the easier it is for available water to evaporate. When water vapor cools, it condenses back into liquid form or solid form and eventually falls out of the sky as precipitation. This is part of the water cycle. There will always be water in the atmosphere in the form of a solid, liquid, or gas, due to the water cycle.



How is water present in the atmosphere as a solid, a liquid, and a gas?

What Do You Think?

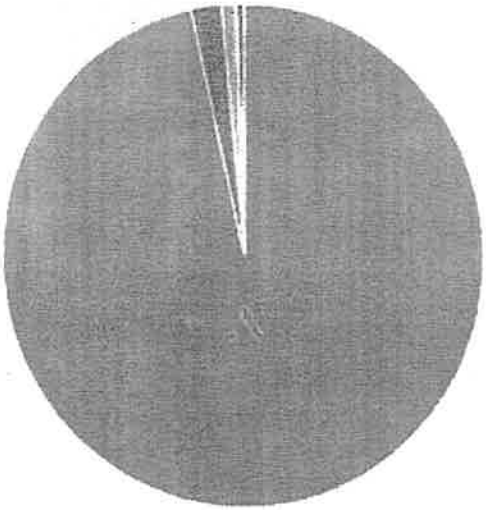
Using the information you read about and the percentages that were given in the text, label the pie chart to accurately describe the distribution of Earth's water. Be sure to look back and include the percentages in your pie chart.

Label:

- Surface Water
- Ice Caps and Glaciers
- Groundwater
- Salt Water

Distribution of Water on Earth

use colored online version for a key



Questions:

If there is no way to increase the amount of fresh water here on Earth, what are some ways in which we can conserve the fresh water we do have?

Do you think we will ever run out of fresh water? Why?

What do you think would happen to our planet and the organisms living here if we ran out of fresh water?

Graphic Organizer

Name: _____ Date: _____

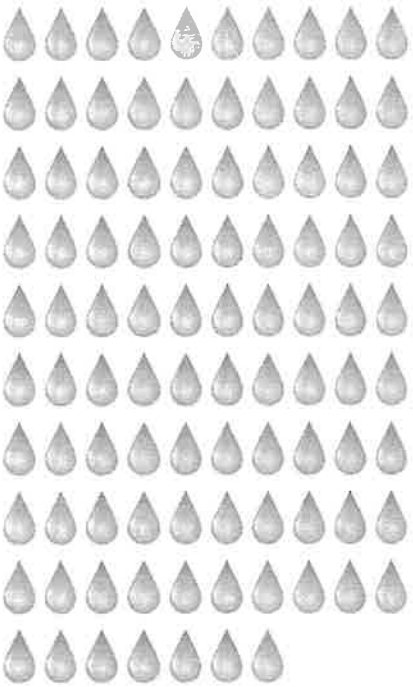
How Much Water?

Directions

Label the chart demonstrating the distribution of water on Earth. Create a symbol to represent each type of water source and add your symbols in the empty rectangles. Use the table at the bottom of the page to list examples of bodies of fresh water.

Water on Earth

97% _____ _____



3% _____ _____

Types of Fresh Water

Types of Surface Water

Linking Literacy

Name: _____ Date: _____

Main Ideas and Details

While you read: Look for details in the text that give more information about the two text topics listed below. Record your main idea, examples, and two details for each topic.

Text Topic: **Fresh water**	
Main Idea:	Examples:
Detail 1:	Detail 2:

Text Topic: **Salt water**	
Main Idea:	Examples:
Detail1:	Detail 2:

Linking Literacy

Name: _____ Date: _____

Roundtable Review

After reading the text, read the questions below and write down your answers to the questions. Record why you think your answers are correct and cite evidence from the text. Discuss your answers with your group and record the group consensus in the final column.

Question	What Do You Think?	Why Do You Think That?	What Is Your Evidence?	Group Consensus
1. Does our Earth's large amount of salt water serve a purpose?				
2. How does the water cycle link fresh water and salt water?				
3. If we are able to treat fresh water for drinking, why do we need to conserve it?				

Content Connections Video

Name: _____ Date: _____ Group: _____

Underground Caves

1. Do you think the water in the cave is fresh water or salt water? Why?

2. What safety concerns would be important for cave diving?

Content Connections Video

Name: Date: Group:

Glaciers 1

1. How do glaciers form? (Pause 0:22)

2. How old can the ice inside glaciers be? (Pause 0:32)

3. What can scientists learn by studying glaciers? (Pause 0:44)

4. Draw a picture of a glacier. (Pause 1:06)

Content Connections Video

Name: _____ Date: Group:

Glaciers 2

1. Where are glaciers found on Earth? (Pause 0:16)

2. How much of Earth's freshwater is contained in glaciers? (Pause 0:42)

3. Glaciers move at different rates. How fast can some glaciers flow? (Pause 1:14)

4. What three processes slowly reshape the land as glaciers flow over it? (Pause 1:25)

5. What is **freeze-thaw weathering**? (Pause 1:42)

6. Describe the process of **plucking**. (Pause 1:56)

Content Connections Video

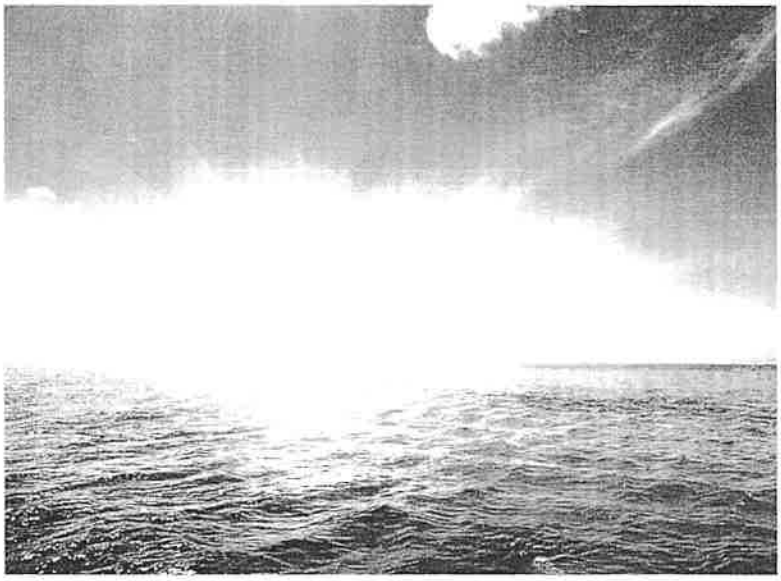
7. Draw a picture of the **striations** that **abrasion** leaves behind after a glacier flows over land. (Pause 2:14)

8. What has happened to glaciers in the past as Earth's climate has warmed and cooled? (Pause 2:25)

Science Today

Name: _____ Date: _____

Demand for Drinking Water



1. Why are people concerned about meeting the demand for drinking water?

_____

_____

2. Why do you think they are trying to use water from the ocean?

_____

_____

3. Write a short proposal to your local government for why ocean desalination could be beneficial. Be sure to include data about the distribution of water on Earth as evidence for your proposal.

_____

_____

_____

_____

_____

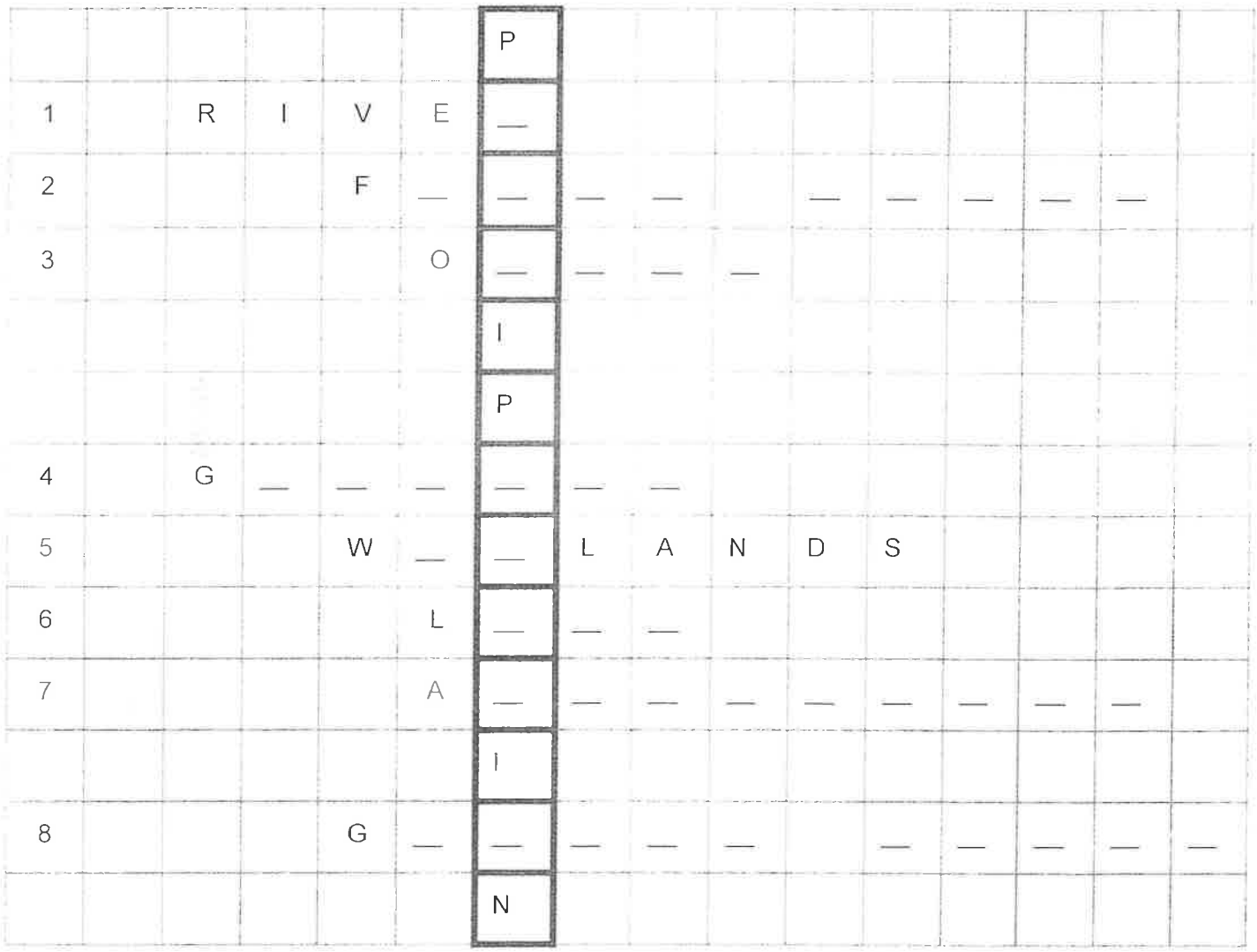
_____

Independent Practice

Name: _____ Date: _____

Part I: Secret Word

Directions: Use the clues to complete the puzzle and find the secret word.



1. Streams flow into this freshwater source that continues toward the ocean.
2. This makes up only 29% of Earth's total water supply.
3. The majority of salt water is found in this water source.
4. An extremely large block of ice that weathers and erodes land, creating U-shaped canyons
5. An area where water keeps some shallow areas flooded and keeps the soil wet
6. Fresh water that is much larger than a puddle, such as _____ Ontario, _____ Superior, and _____ Michigan
7. This is where clouds are formed with the condensation of water.
8. Water that is found under Earth's surface

Secret Word: _____

Independent Practice

Part II: Break the Code

Directions: Read each clue and write the word or phrase, using the code. Match each number under the line to the pair of letters for that number. Decide which letter to use to correctly spell each word.

AB	CD	EF	GH	IJ	KL	MN	OP	RS	TU	VW	XY
1	2	3	4	5	6	7	8	9	10	11	12

1. Water not found in the ocean

_ _ _ _ _ _ _ _ _ _ _ _ _
3 9 3 9 4 11 1 10 3 9

2. A freshwater source in which moving water combines and flows from smaller creeks toward its final destination

_ _ _ _ _
9 5 11 3 9

3. On Earth, 71% of total water found is found here.

_ _ _ _ _
8 2 3 1 7

4. An area where water keeps some shallow areas flooded and saturates the ground

_ _ _ _ _ _ _ _
11 3 10 6 1 7 2 9

5. A frozen freshwater source that can move about an inch per year

_ _ _ _ _ _ _
4 6 1 2 5 3 9

6. A freshwater body of water surrounded by land

_ _ _ _
6 1 6 3

7. Some humans drill wells to access this freshwater source.

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _
4 9 8 10 7 2 11 1 10 3 9

8. This is where clouds are formed and is made of a mixture of gas.

_ _ _ _ _ _ _ _ _ _
1 10 7 8 9 8 4 3 9 3

Concept Attainment Quiz

Name: _____ Date: _____

Part I: Vocabulary Matching

___ A large, slow-moving, long-lasting accumulation of snow and ice that develops on land

___ A small body of freshwater that flows into a river

___ A large body of water that is still and is surrounded by land

___ Areas where standing water covers the soil or an area where the ground is very wet

___ The entire body of saltwater that covers about 71% of Earth

A. Ocean

B. Lake

C. Glacier

D. Stream

E. Wetlands

Part II: Identification

Use the words below to label each color of the pie graphs. Write a legend below.

Surface water	Saltwater	Groundwater	Glacier and ice caps
Freshwater	Frozen water