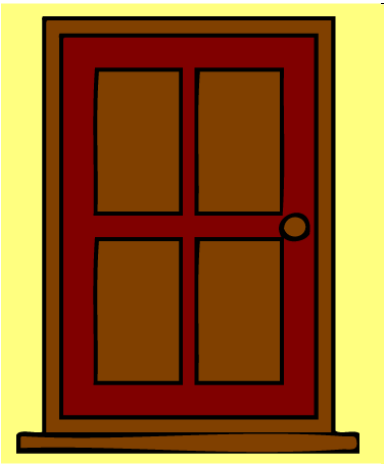
Mr. Fifield's Expectations

1) Be on time for Class

2) Be prepared for class

3) No waiting outside the door for me



Mr. Fifield's Expectations

4) Participate and listen to others.

5) Complete homework and assignments

- Tutorials

6) Get permission to use the bathroom

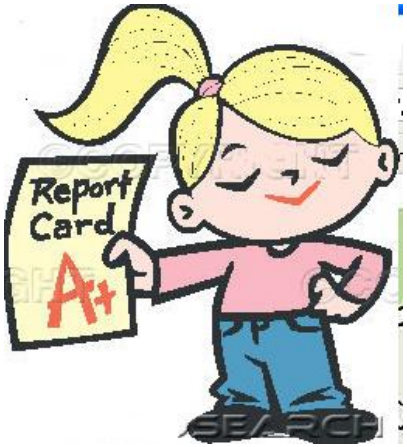
- What to do if you are sick
- Any medical conditions

Mr. Fifield's Expectations

7) Early Dismissal for lunch, you must go to the cafeteria

8) Remember laboratory safety rules

9) Work to your potential



Mr. Fifield's Expectations

10) Obtain work you missed while absent.

11) Look at the school's web page for homework, test, quiz (Snow days)

Penalties For Rule Infractions

- Removal from class
- Call to parent or Guardian
- Removal of lab privileges, Field trips
- Disciplinary action taken

Course Outline

Unit 1: Water Systems on Earth's Surface

Unit 2: Optics

Unit 3: Fluids

Unit 4: Cells, Tissues, Organs, and Systems

Evaluation

- Unit Tests 40%
- Quizzes 10%
- Performance Assessment 30%
- Performance Assessment Project 10%
- Scientific Literacy Assessment 10%

Science 8

Unit 1:

Topic 1: Distribution of Water

Teacher: Mr. Fifield

Large Ocean Wave

People who study water

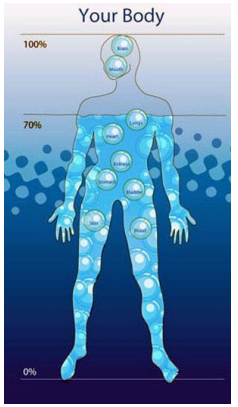
Hydrologist A person who studies Earth's water systems and helps to find solutions to problems of water quality and quantity

Oceanographer: is a scientist who studies all aspects of the ocean. They are concerned with the biology, chemistry, physics and mathematics of the ocean.

Why is water important?

- **Earth (Blue Planet) is covered in water and many uses:**

1) Allows life to thrive on earth(habitat).



2) Living organisms are made of water (60% - 70% of human body

3) major effect in shaping the landscapes

4) Affect the weather and climate

5) Affect the culture

6) Use to provide energy

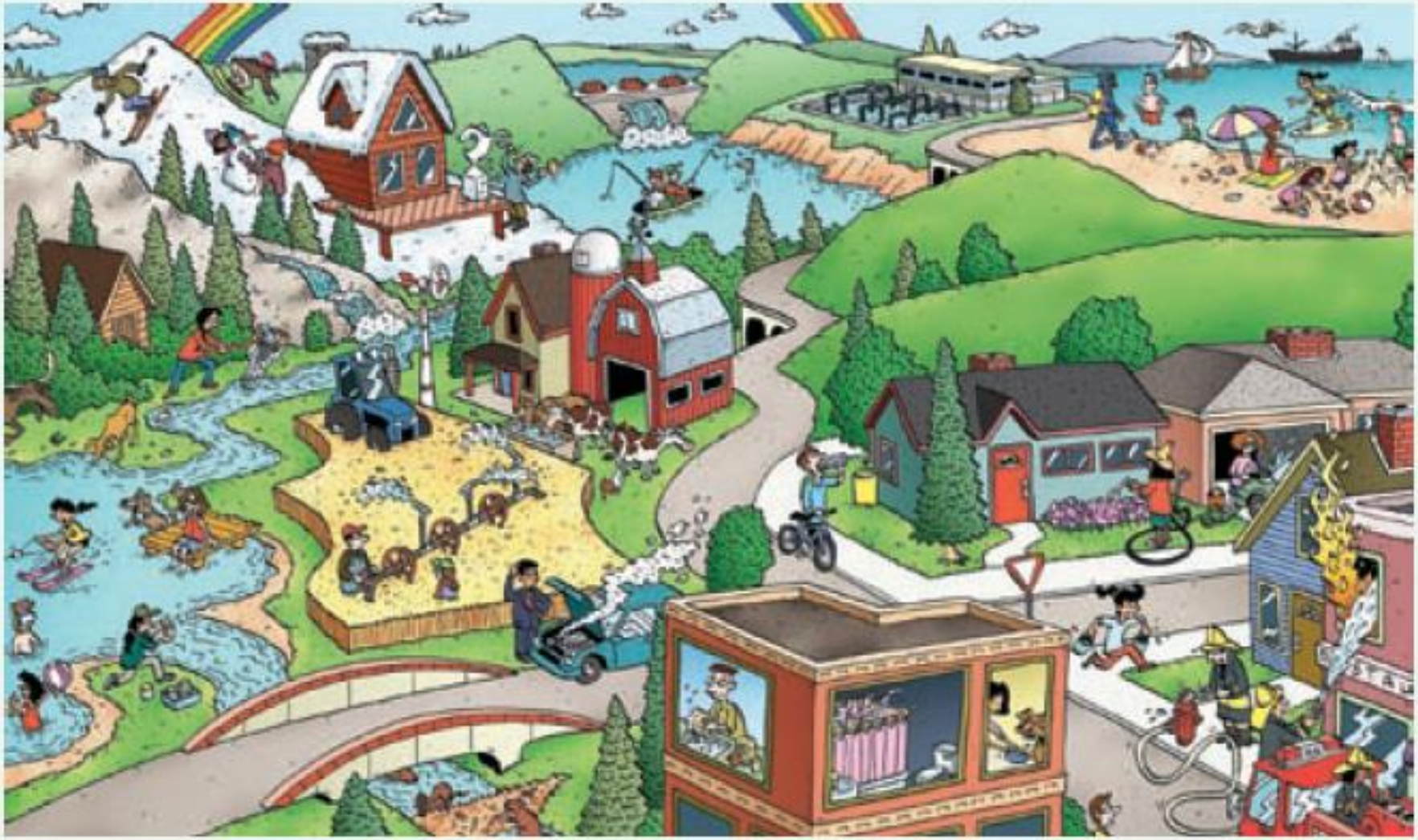
How Long Can You Live Without Water?

Max Daily Temperature	Number of Days in the Shade					
	No Water	1 Quart .95 Liter	2 Quarts 1.90 Liters	4 Quarts 3.79 Liters	10 Quarts 9.46 Liters	20 Quarts 18.93 Liters
120 F / 48.9 C	2 days	2	2	2.5	3	4.5
110 F / 43.3 C	3	3	3.5	4	5	7
100 F / 37.8 C	5	5.5	6	7	9.5	13.5
90 F / 32.2 C	7	8	9	10.5	15	23
80 F / 26.7 C	9	10	11	13	19	29
70 F / 21.1 C	10	11	12	14	20.5	32
60 F / 15.6 C	10	11	12	14	21	32
50 F / 10.0 C	10	11	12	14.5	21	32

Student Activity

- The Many Ways People Use Water

See page 5



How do you use water?

House Hold Use

Personal Use

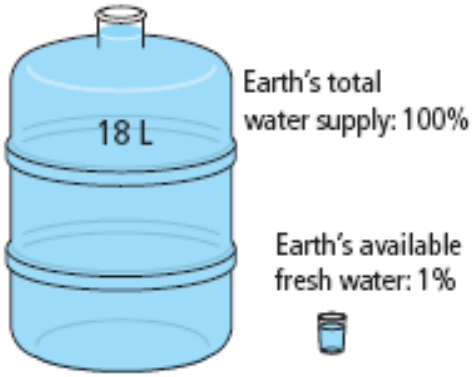
Recreational Activities

Household Use of Water In Canada

Distribution of the World's Water

Earth has been called "the blue planet." From space, its surface appears to be mostly composed of water. **The is composed of 70% water and 30% land**.

Earth's total water supply is distributed as follows



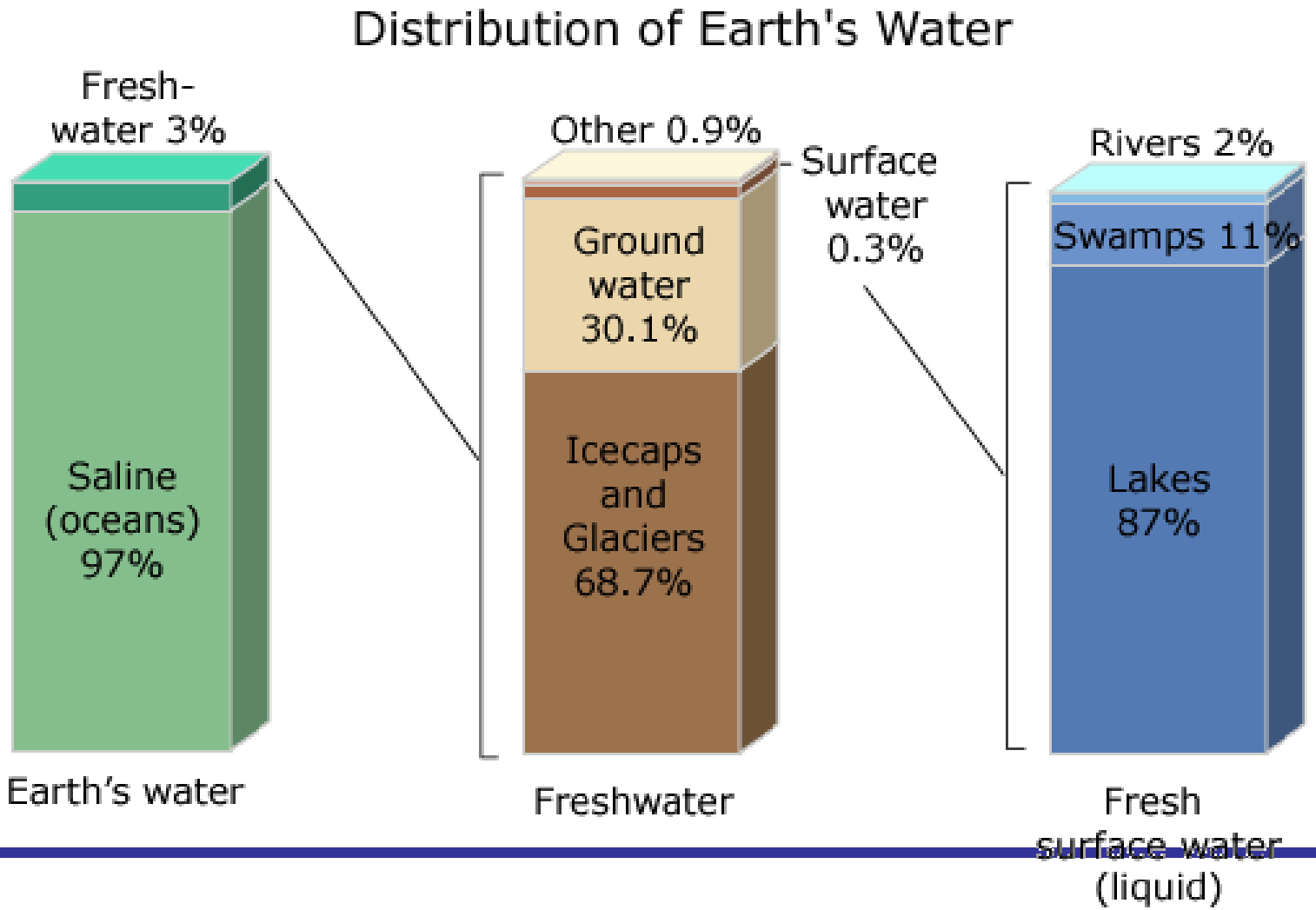
97 % is salt water

3% is freshwater

- **2% frozen as ice**
- **1% liquid freshwater**

The water we need to survive is actually in very short supply.

Water Distribution

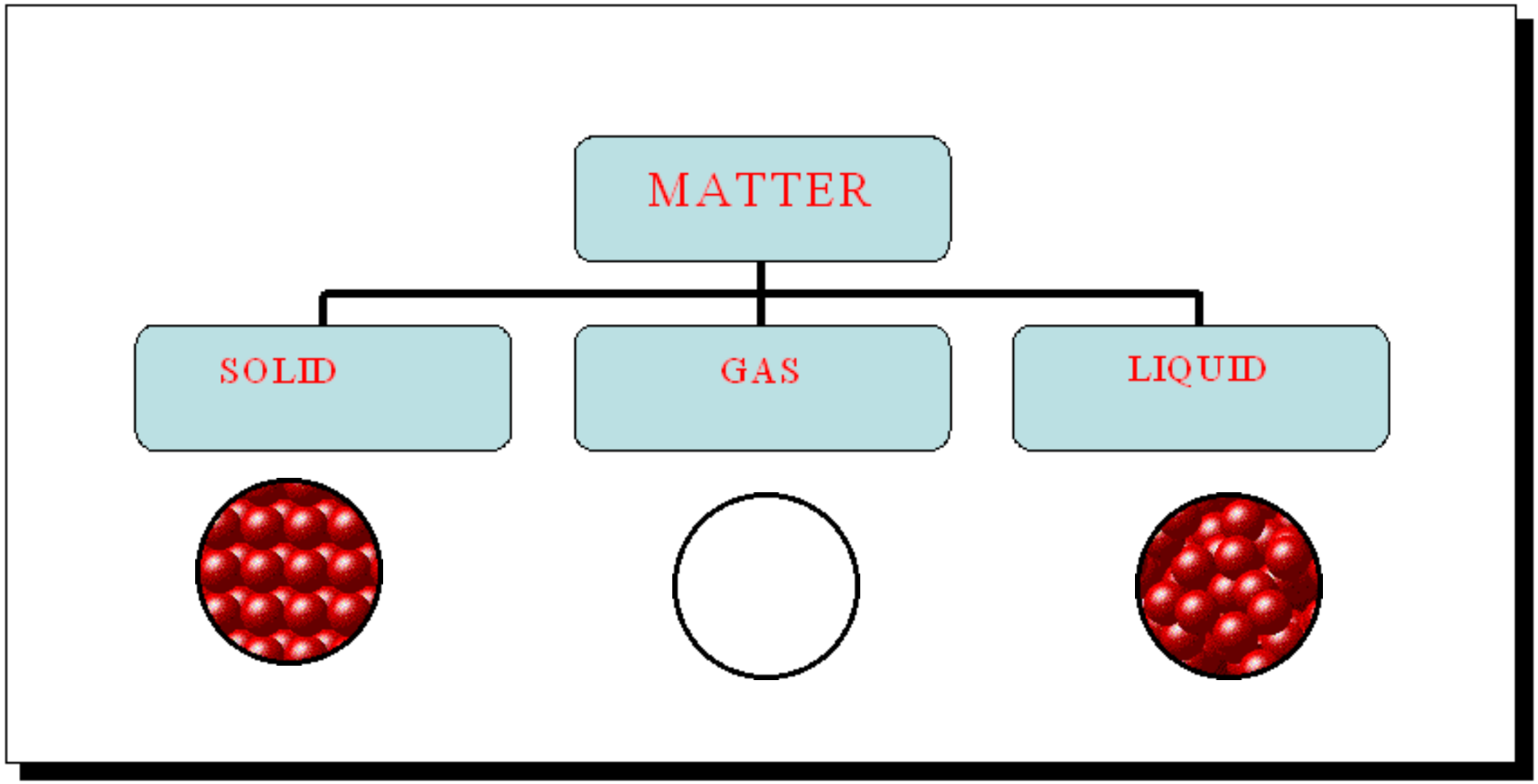


: OBSERVING MATTER

Matter is anything that has mass or takes up space.

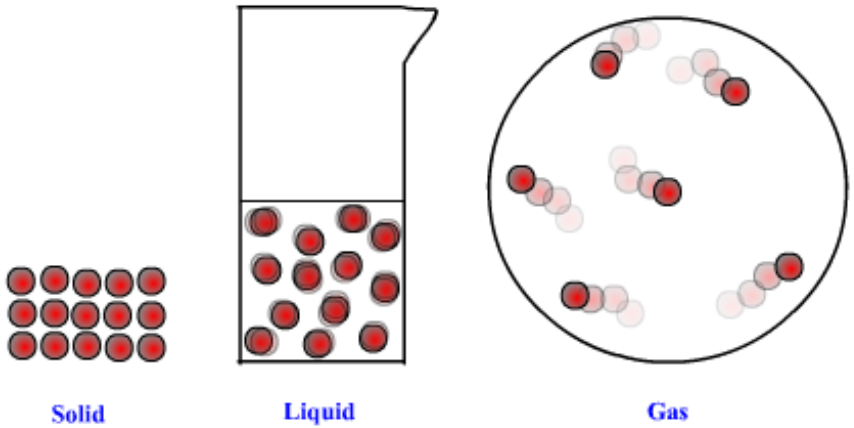
Examples: Books, humans, Oxygen, water…etc.

Three States of Matter

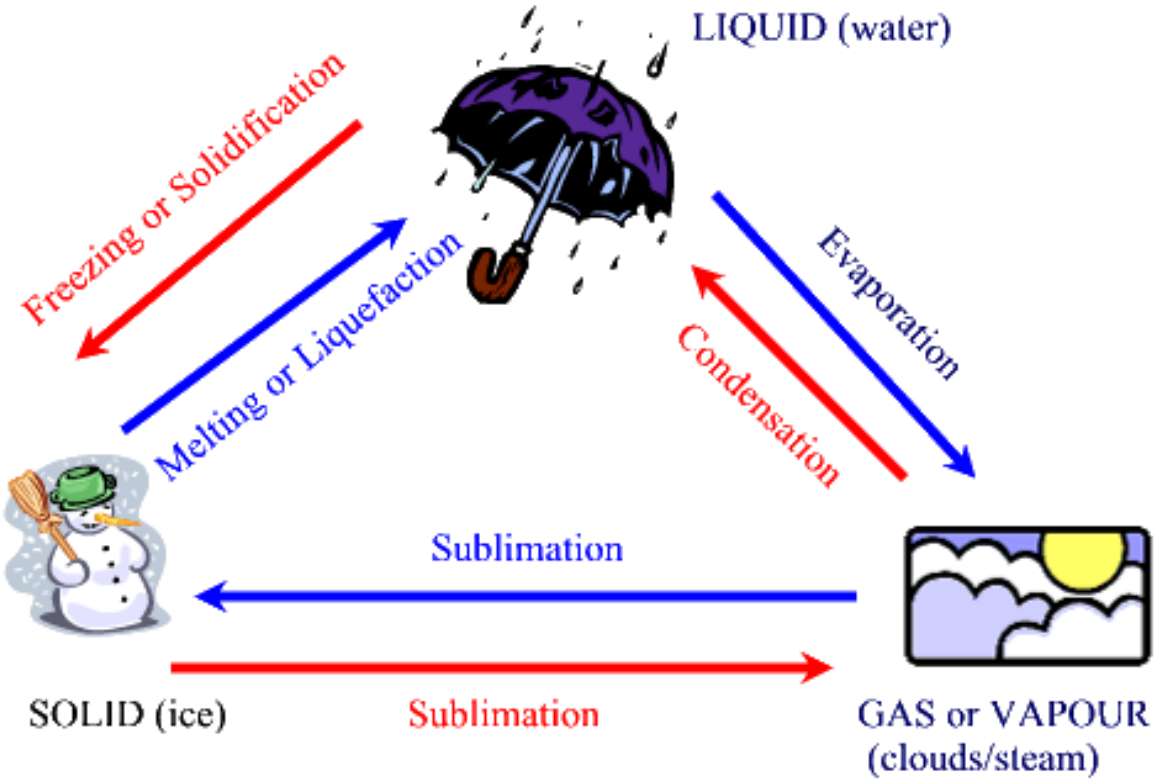


Changes in States of matter

When enough heat is added to a solid, it will eventually *melt* and become a liquid. More energy will result in it becoming a gas as the *boiling* point is reached. As particles gain energy they move faster, require more space and therefore spread out (their volume Increases).



Changes in States of matter



Changes of State

- Melting: changing from a solid to a liquid.
  - Animation of ice melting.
- Freezing: changing from a liquid to a solid.
- Evaporation: changing from a liquid to a vapour.
- Condensation: changing from a gas to a liquid.
- Sublimation: changing directly from a solid to a gas or a gas to a solid. Ex: snowflake forming, dry ice used in a smoke machine

Changes in States of matter

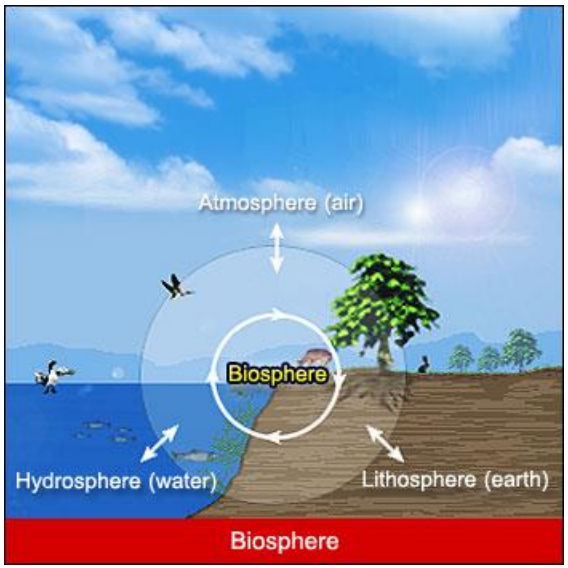
CHANGE	FROM	TO	EXAMPLE
Sublimation	solid	gas	Moth crystals disappear when left in a closet for several days
Sublimation	gas	solid	frost forms on a car's windshield
Melting	solid	liquid	An ice cube turns into water when left out of the freezer
Freezing	liquid	solid	bottle of water will turn into ice if left in the freezer
Condensation	gas	liquid	Drops of water form on the mirror when taking a hot shower
Evaporation	liquid	gas	Rain dries up when the sun comes out

The Four Spheres of the Earth

Lithosphere (litho = stone) is the solid, rocky crust covering entire planet.

Hydrosphere (hydro water) is composed of all of the water on or near the earth. This includes the oceans, rivers, lakes, and even the moisture in the air.

Atmosphere (atmo = air) The atmosphere is the body of air which surrounds our planet. Most of our atmosphere is located close to the earth's surface where it is most dense



Biosphere (bio = life) The biosphere is composed of all living organisms. Plants, animals, and one-celled organisms are all part of the biosphere.

Why do we not run out of water?

WHERE DOES THE WATER COME FROM?

Water Cycle is a continuous cycle where water evaporates, travels into the air and becomes part of a cloud, falls down to earth as precipitation, and then evaporates again

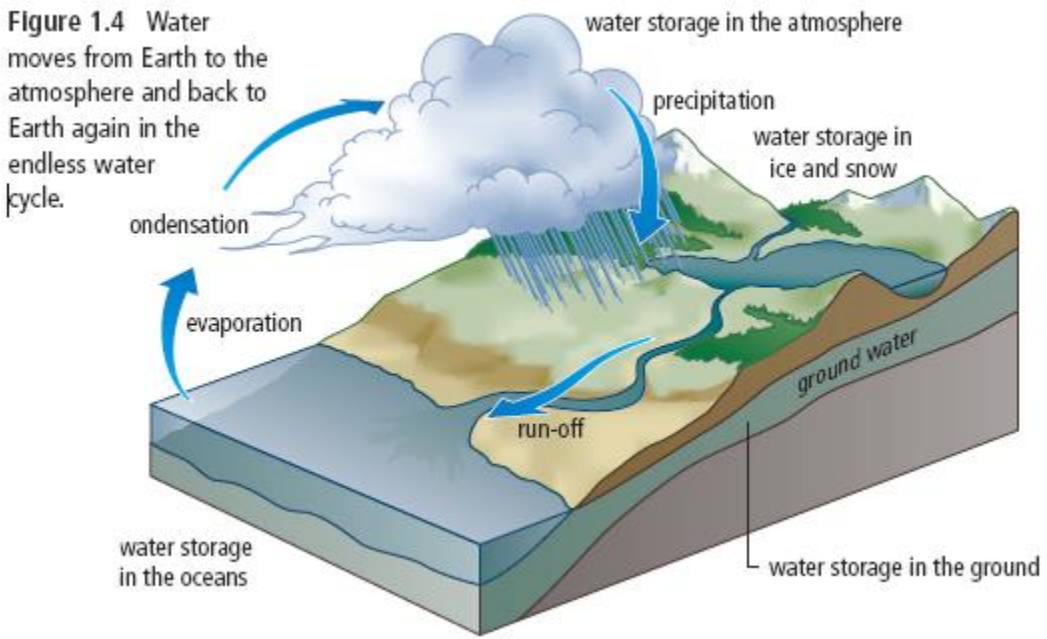
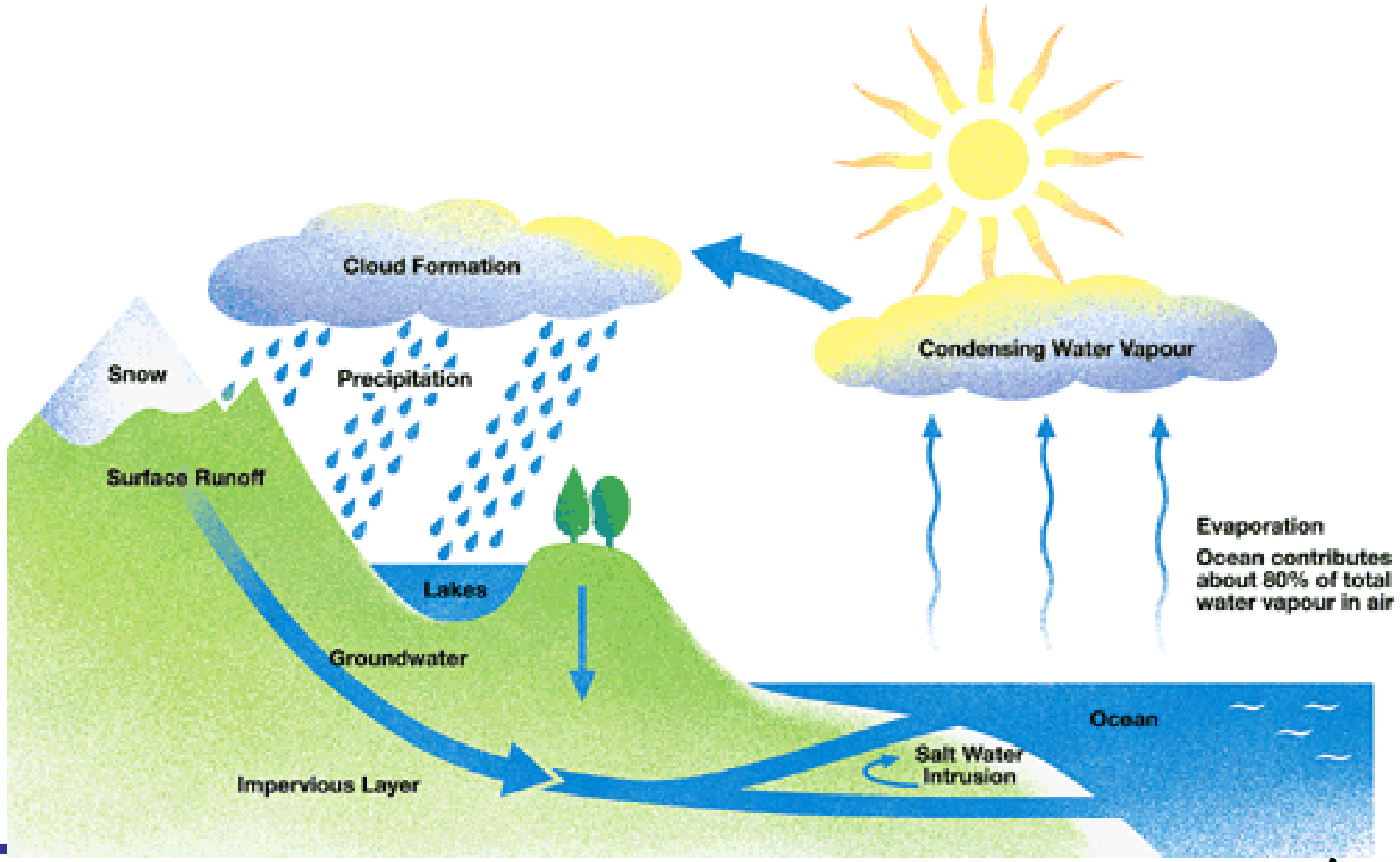


Figure 1.4 Water moves from Earth to the atmosphere and back to Earth again in the endless water cycle.

The Water Cycle...



The water cycle is powered by the sun’s energy.

It is the water cycle that causes water to be transfer throughout the hydrosphere, lithosphere, and atmosphere.

The water of the hydrosphere is distributed in oceans, lakes and streams at the surface of the earth. Evaporation moves the water from these bodies into the atmosphere. Evaporation Also moves water from the liquid state in the lithosphere into vapor. The vapor in the atmosphere condenses and returns as liquid to the lithosphere and hydrosphere.

LABORATORY SAFETY

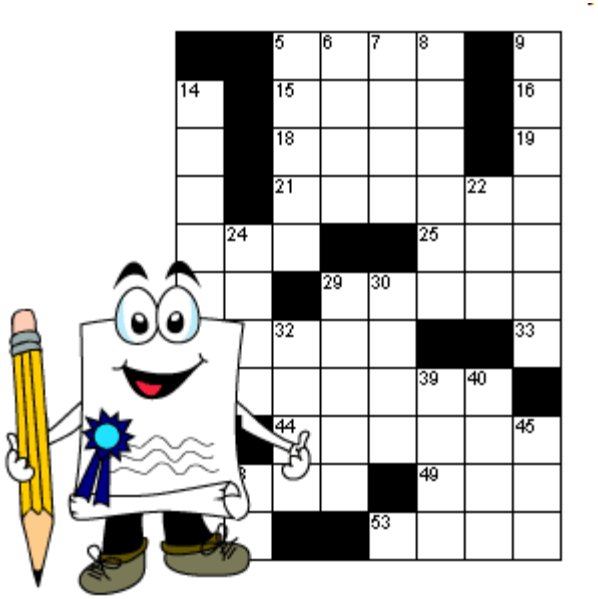
- Show students PowerPoint on Laboratory Safety

- Worksheet on laboratory safety

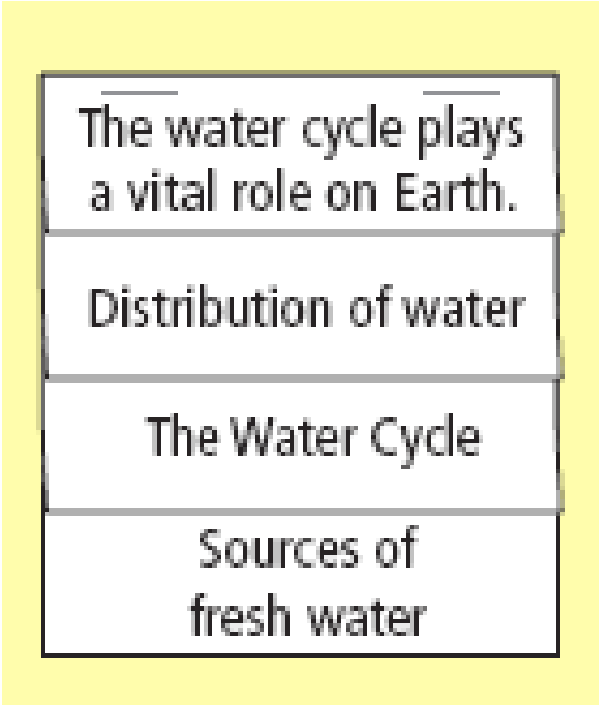
Laboratory- Recycle The Water

Video on Water Cycle

Crossword 1



FOLDABLES



See page 7

Check Your Understanding

- Page 13 #1, #2, #3 #5, #6, #7 and#8

Page 13 #1, #2, #3

Science 8

Unit 1:

Topic 2: Comparing Freshwater to Saltwater


Difference Between Salt Water
and Fresh Water

The Salty Fact about Penguins

Penguins spend half of their lives, swimming and feeding in the ocean on fish, krill, squid, and other small aquatic creatures. Because of this, they digest a large amount of salt water in the process of eating. In order to get rid of the salt, penguins have an organ called the supraorbital gland that collects and excretes the salt, thus keeping it out of the penguin's bloodstream. To get rid of the salt that the gland collects, the penguin excretes a salty liquid through nasal passages in its bill, which often makes them looklike they have a runny nose.

Comparing Ocean Water and Fresh Water

Three ways in which fresh water differs from ocean water are:

1) **Salinity** - the amount of salt dissolved in a specific amount of water.

Fresh water has tiny amounts of salt, ocean water is more than 200 times saltier

The average salinity in all the world's oceans is about 35 parts per thousand.

Intense evaporation in tropical climates is the reason for high salinity in ocean waters near the equator. →

Did You Know?

If all the water could be boiled out of the oceans, the salt left behind would be enough to cover Earth in a layer 154 m thick, which is similar to the height of a 50-storey building

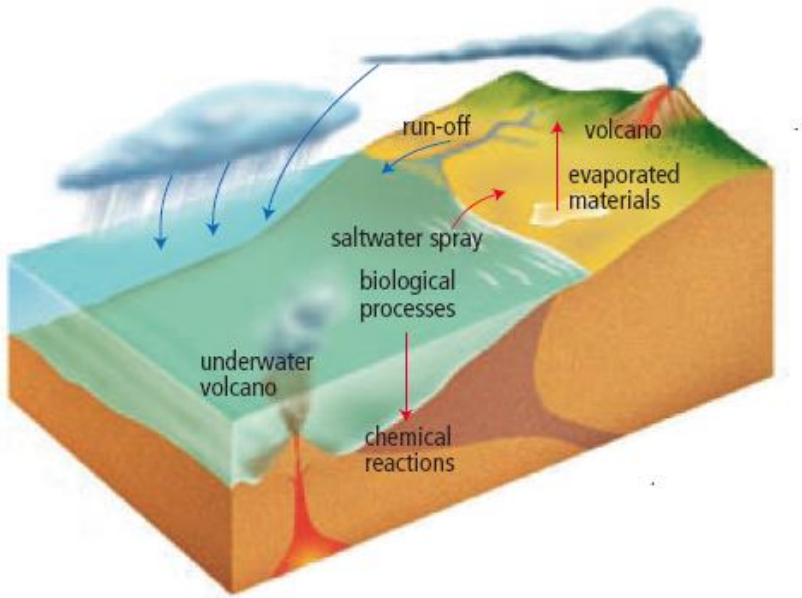
Mini Distillation

See page 15

Where Does the Salt Come From?

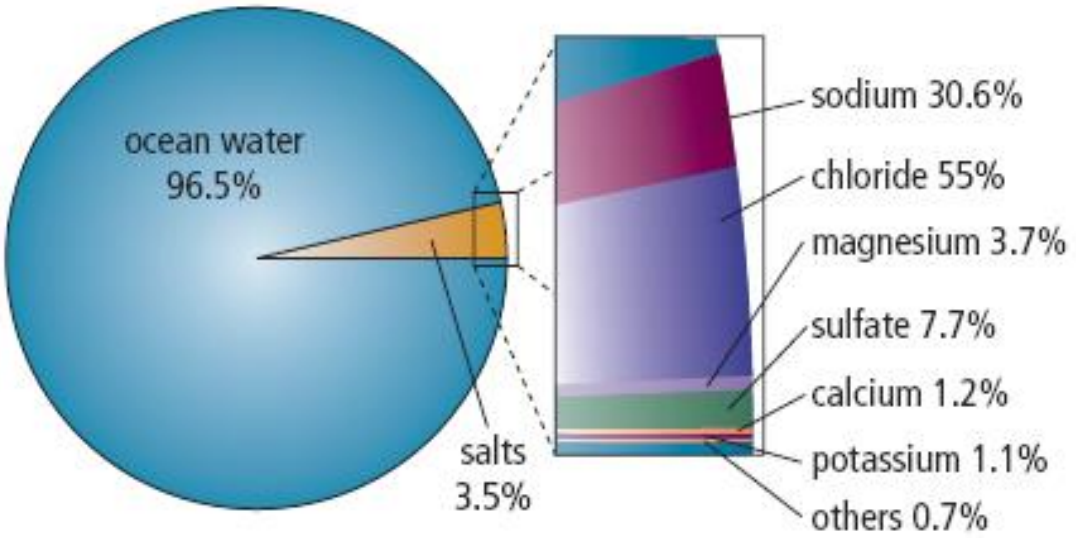
- Salt arrives in the oceans from several different sources.

1) From Rain fall on the land As it travels back to the ocean the water picks up materials from the rocks. These materials are called dissolved solids, and you cannot see them even with the help of a microscope.



2) Volcanoes contribute some chemicals as well. Undersea volcanic eruptions from the sea floor release large amounts of sulphur, fluorine, chlorine, and hydrogen into ocean water

By far the most common material that is deposited into the ocean is sodium chloride, which is the chemical name for salt.



Salinity gives ocean water a different density, freezing point, and boiling point than fresh water. Even though salt water and fresh water are connected, they play different roles in the water cycle. Because there is so much sodium chloride, the water is salty.

2. Density is the amount of mass of a substance in a certain unit volume.

Salt increases the density of water. Therefore, ocean water is denser than fresh water.

There is more mass in 1 L of ocean water than there is in 1 L of fresh water. Ocean water has a density of 1.027 g/L and fresh water has a density of 1.000 g/L

The Dead Sea

Floating in the Dead sea is easy because it is 9 times saltier than Ocean Water.

Freezing Point of Salt Water and Fresh Water

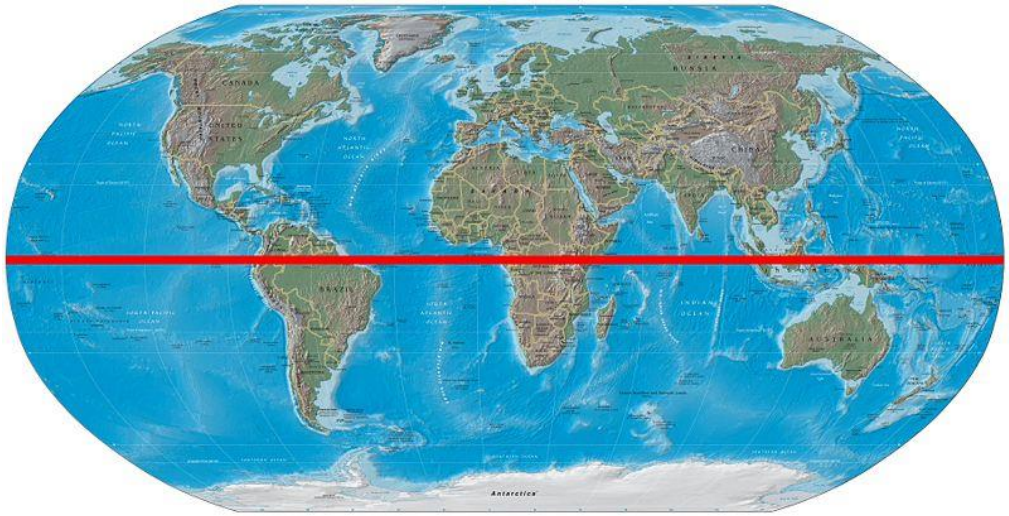
- The **freezing point** of a liquid is the temperature
- at which it freezes.

- The point of fresh water freezing is 0°C.

- Salt water has a freezing point of about –1.9°C.
- - Salt keeps water from freezing

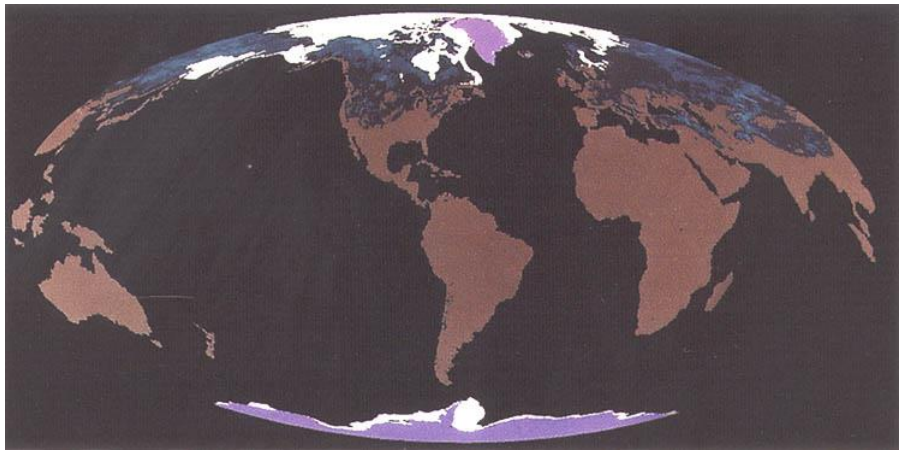
Why Does Salinity Increase Near the Equator?

- Due to the high evaporation rate of the water



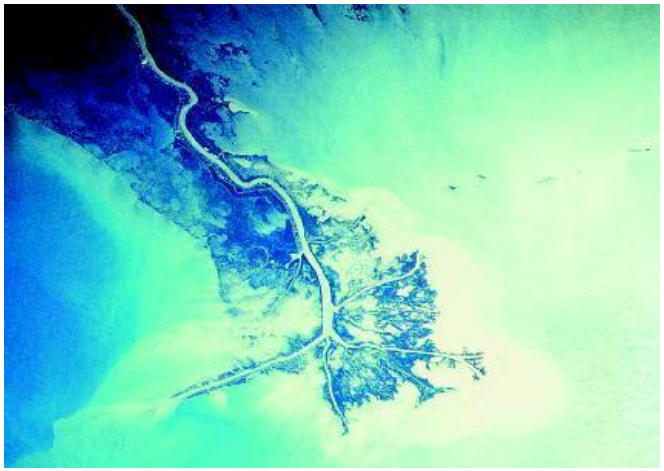
Why Does Salinity Increase Near the North and South Poles?

- when water freezes and changes to ice, it leaves the salt behind



Why Is Salinity Lower Near Continents?

- due to rivers emptying into the oceans and diluting the salt water



Mississippi river emptying into the Gulf of Mexico

Lena river (Russia) empties into the Arctic Ocean

Reading Check

- Page 17 #1 -#5

Checking Concepts

- Page 23 --- #1, #2, #3, #4, #5, #6

- Understanding Key Ideas

Page 23 7, 8, 9, 10

Salinity's Effect on Water Density

See page 17 -19

Core Lab Activities

Activity 1-3B

“Temperature & Water Density”

Science 8

Unit 1:

Topic 3: Sources of Freshwater

Sources of Fresh Water

1) Lakes, Ponds, and Wetlands

A lake and a pond are basically large holes in the ground, filled with standing water. In general, lakes tend to be larger and deeper than ponds

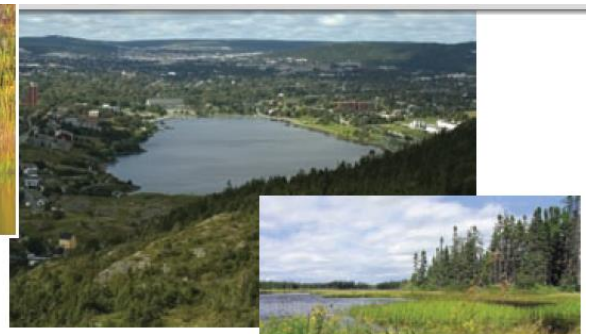
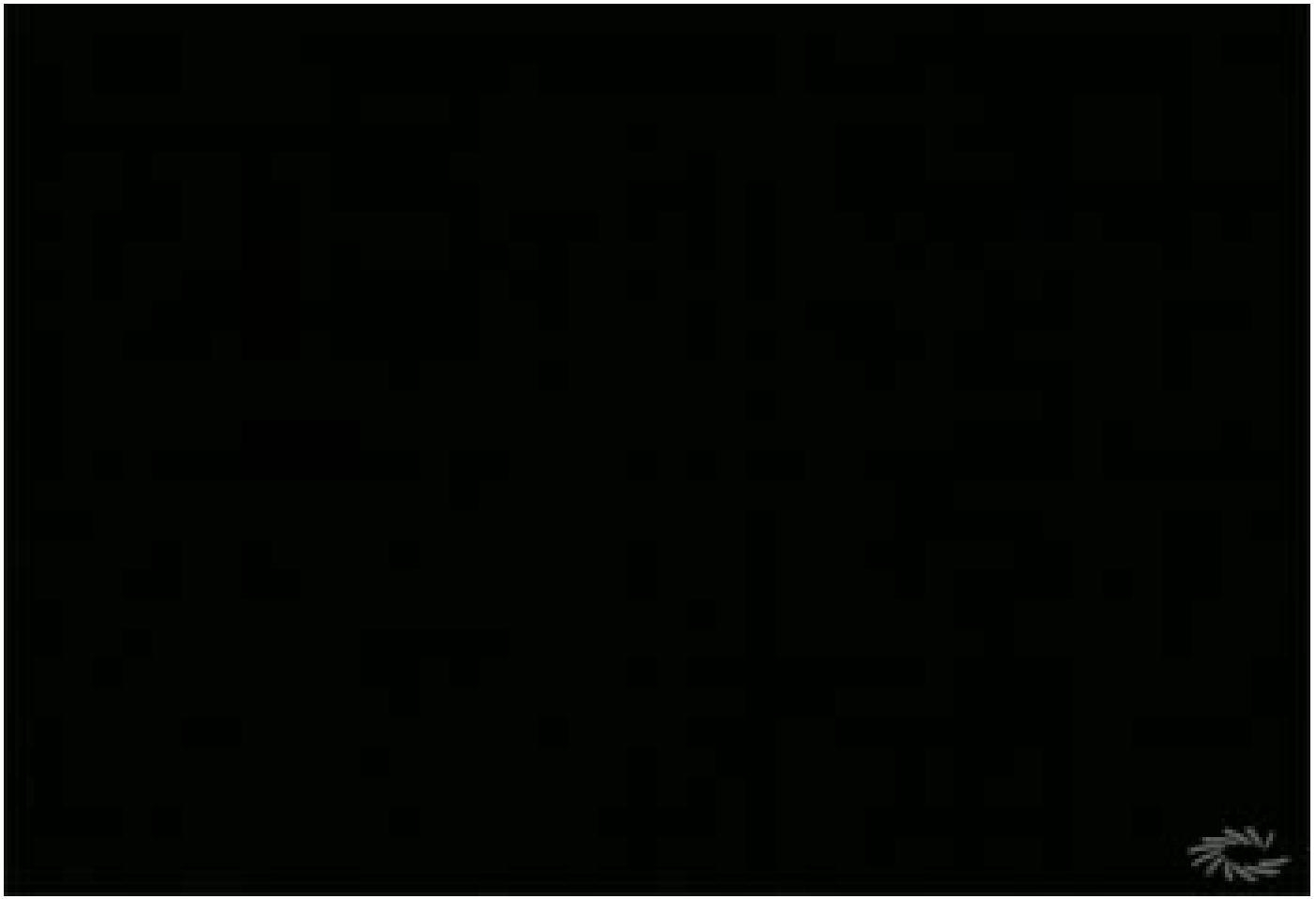


Figure 1.9A Some lakes, like Quidi Vidi Lake in St. John's, can be right in the middle of communities.

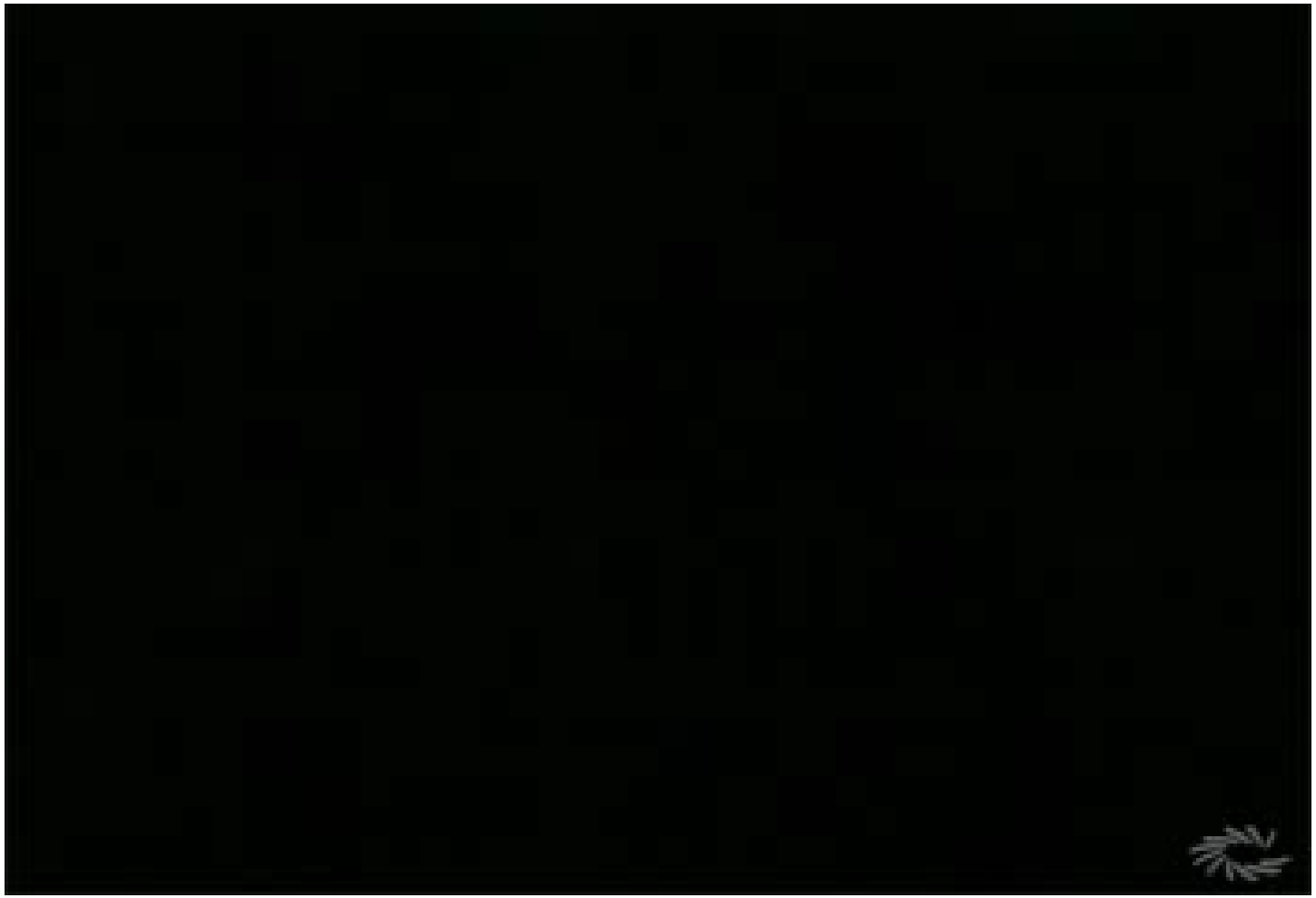
Figure 1.9B Cobb's Pond in Gander, Newfoundland and Labrador

Wetlands are saturated with water all or much of the time. Marshes, for example, are shallow water wetlands

LAKES



WETLANDS



2) Streams and Rivers

Streams and rivers are both fast-flowing waterways

Streams and Rivers

3) Groundwater

Most of the precipitation that falls on land sinks out of sight and is called **groundwater**.

-ground water trickles downward through connected pores and cracks

-it reaches a layer of bedrock.

-it cannot move any deeper and begins to back up above the bedrock.

-It is in this layer that people will drill down into to make wells.

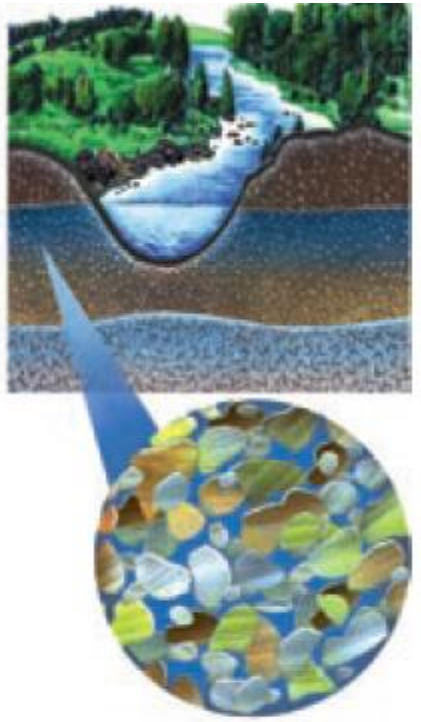
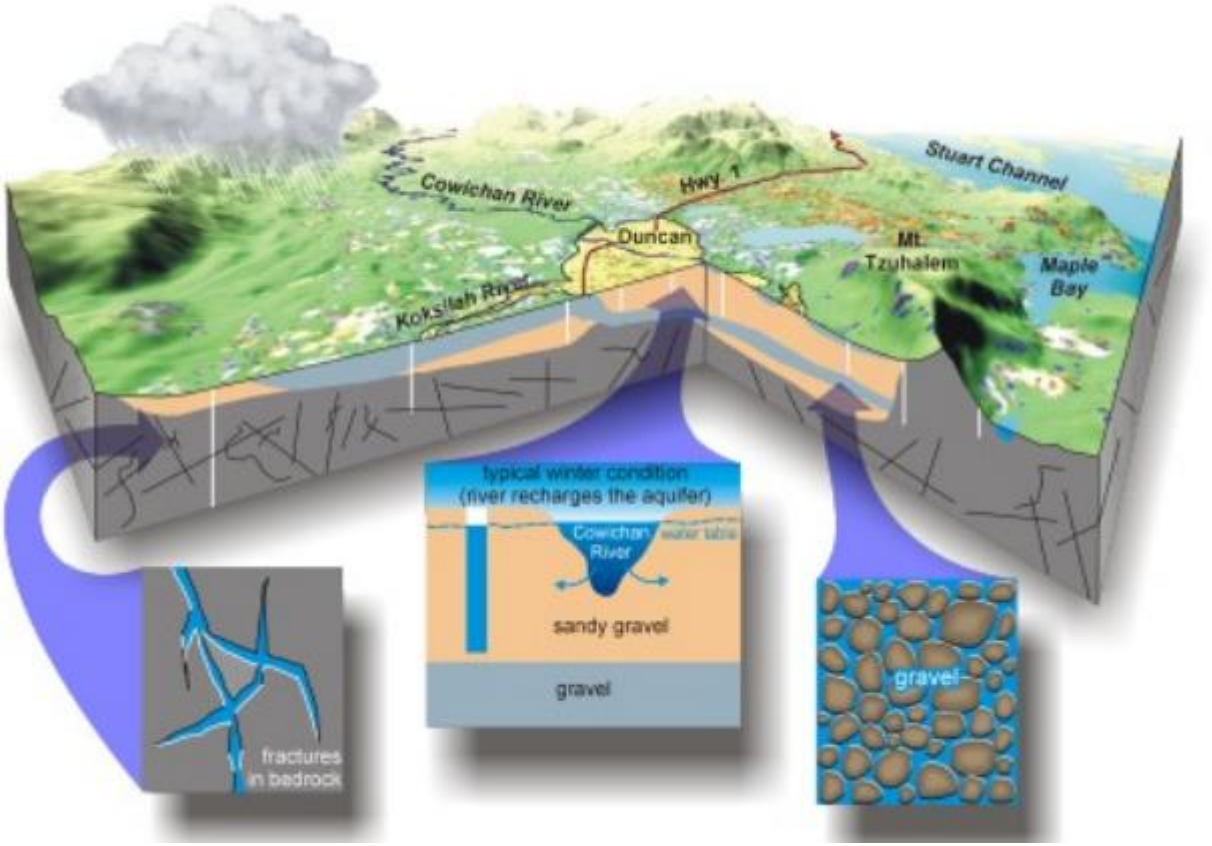
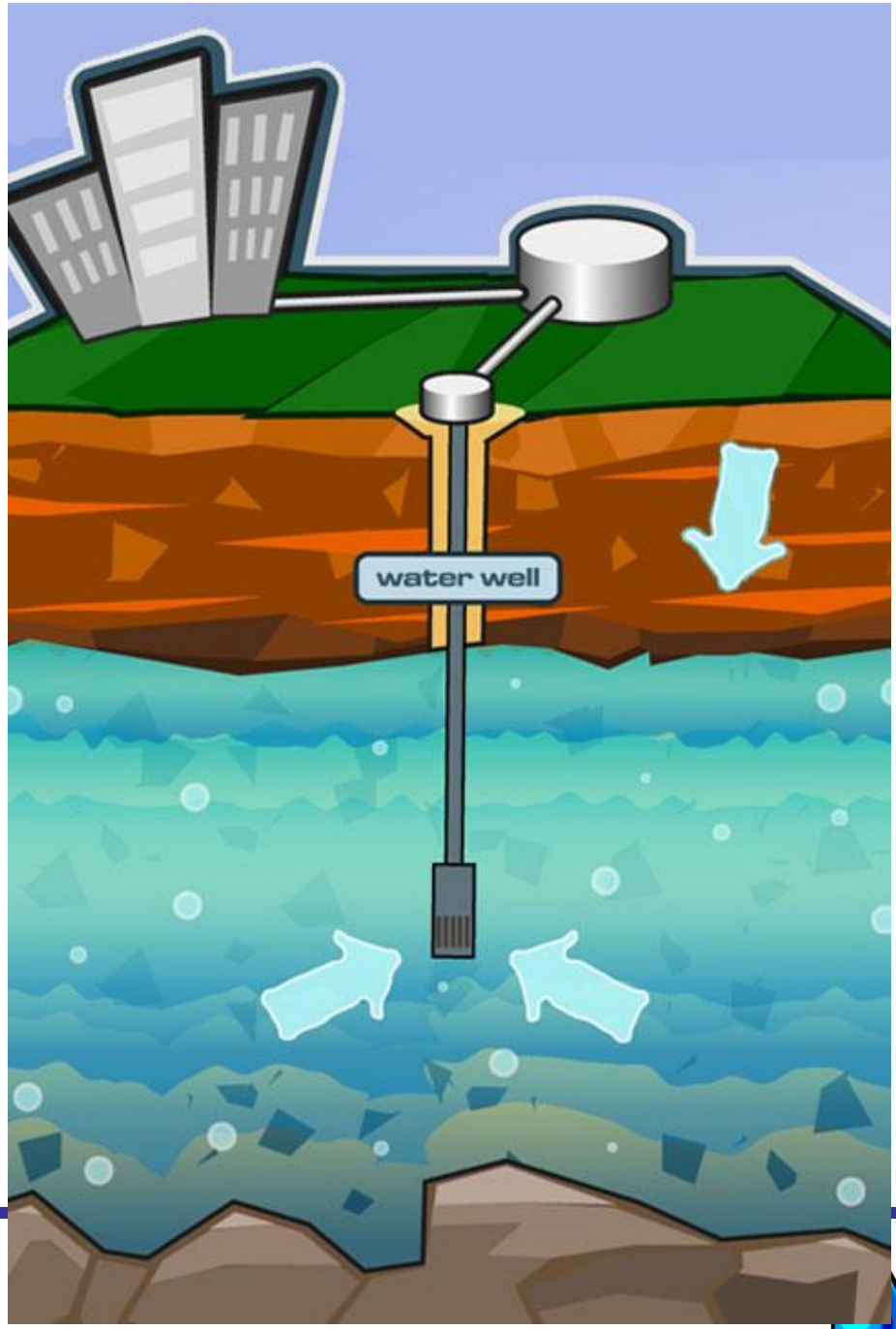


Figure 1.11 Ground water is found under Earth's surface in small spaces between bits of soil and rock.

Groundwater is found below the surface in small pores between rocks and soil



Ground Water

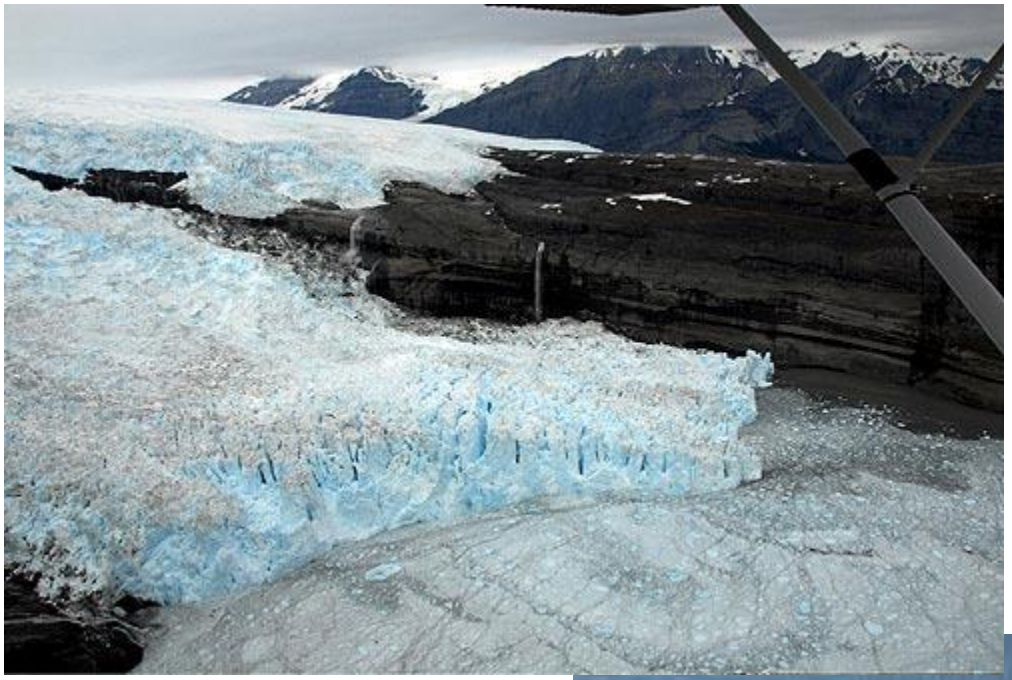


Groundwater

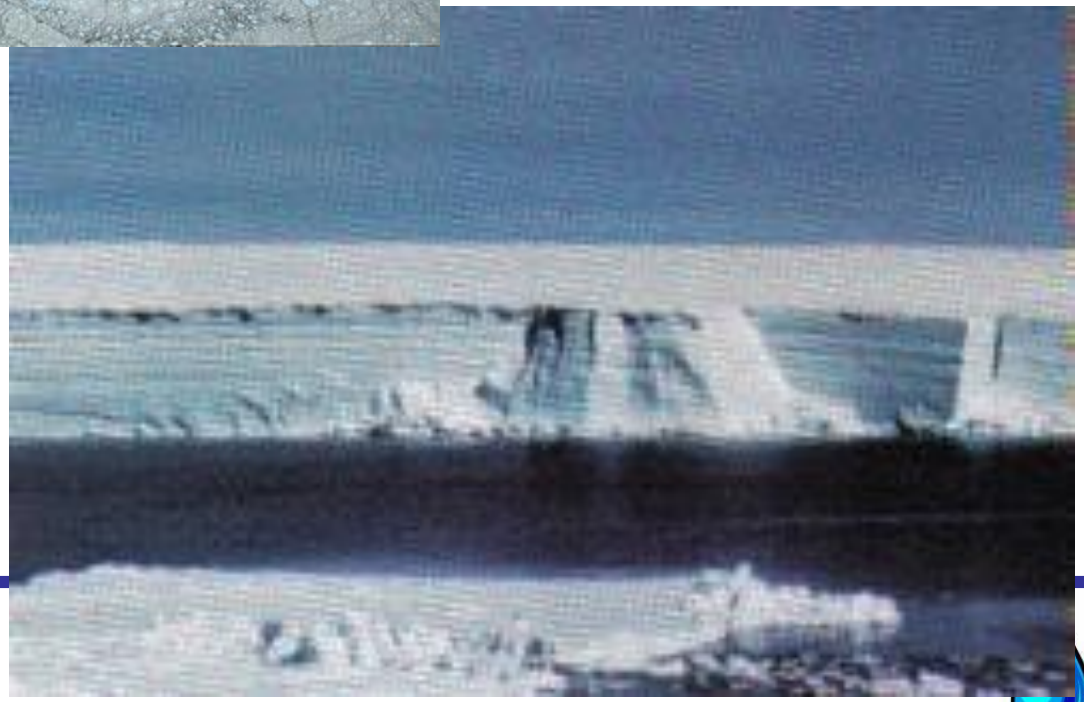
Groundwater

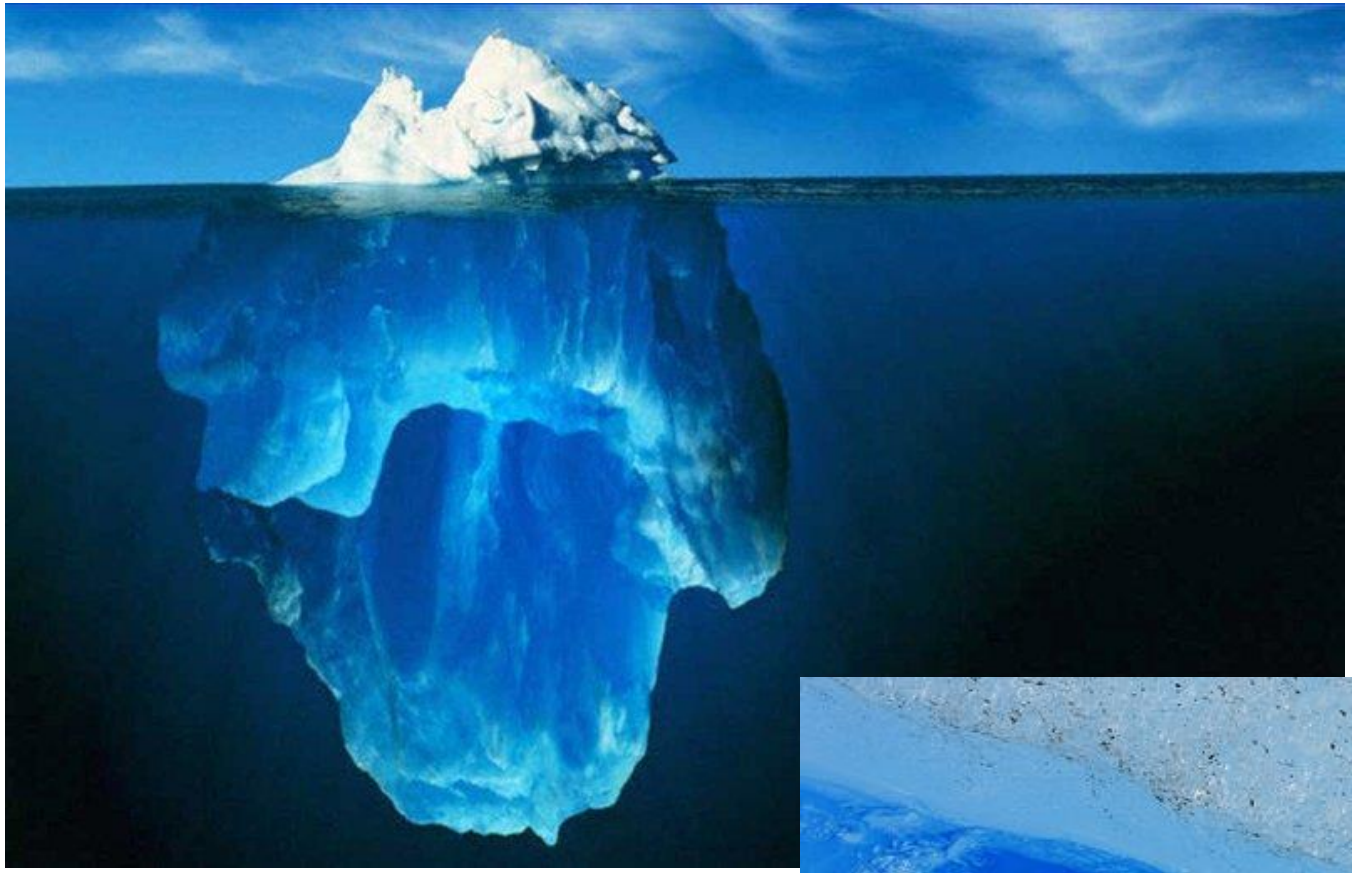
4) Glaciers

- Glacier: A huge mass of ice, formed on land by the compaction and recrystallization of snow, that moves very slowly down slope due to its own weight

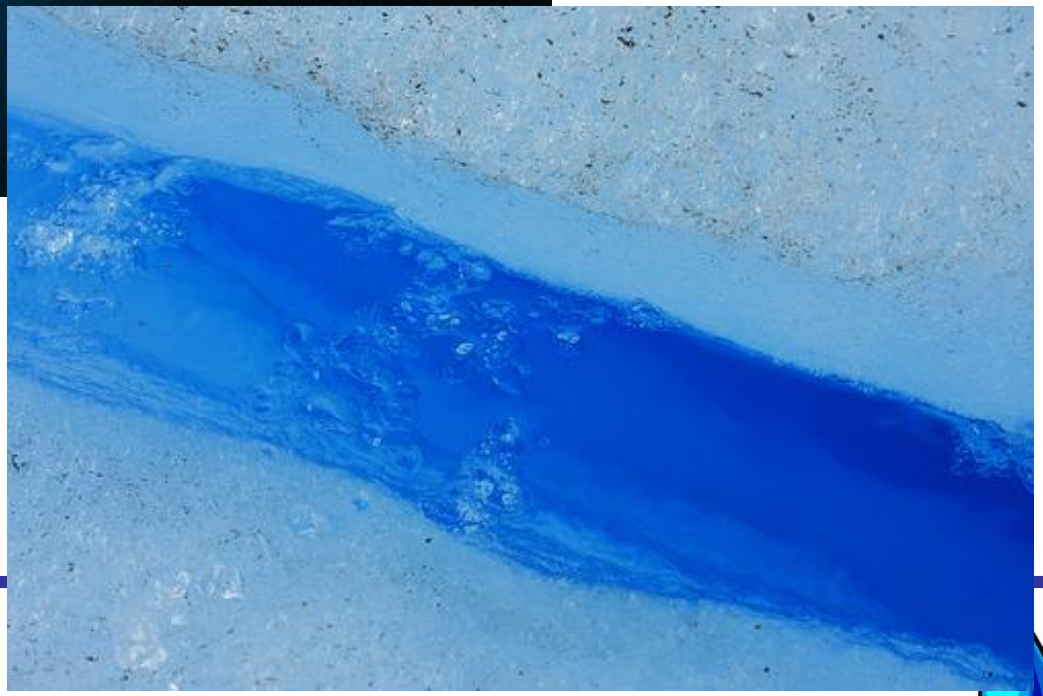


Glaciers in mountains and on the continent of Antarctica

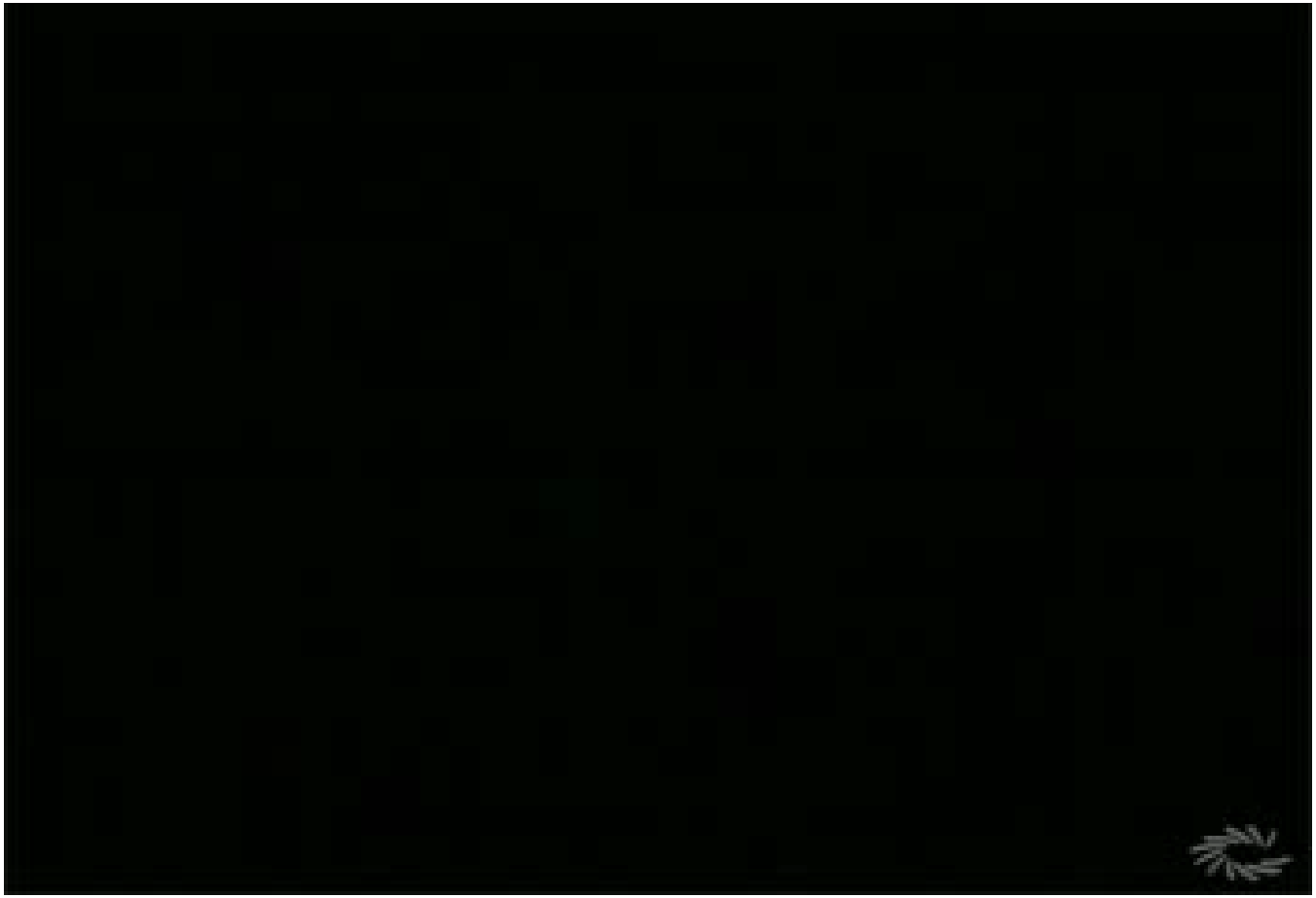




Water trapped in glacial ice



Glaciers



If the glacier reaches an ocean, the ice will start to slowly spill over the edge of the land mass toward the water. Deep cracks called **crevasses** will begin to form across the front of the glacier. Under gravity's pull, large pieces of the glacier will eventually break off and crash into the ocean. These big chunks of ice are called **icebergs**

Glaciers and the Water Cycle

Glaciers act as natural reservoirs. They collect snow throughout the fall, winter, and spring. They gradually release this reserved water as meltwater in summer

Glaciers are excellent storehouses of vast quantities of fresh water.

Ice Ages

- Earth has had at least seven major periods of cooling called ice ages. The most recent ice age began about 120 000 years ago, and ended only 11 000 years ago

Glaciers covered as much as 28 percent of Earth.

Figure 1.14 During the last ice age, glaciers in North America covered an area three times as large as they do today. Northern sections of the Yukon and Alaska remained free of glaciers because they were too dry.

Glaciers and Global Warming

- Global warming refers to the increase in the average temperatures of Earth's near-surface air And oceans.

- In the last 100 years, the average surface temperature on Earth has increased 0.5°C.

Most glaciers in the world today are receding, meaning that they are melting and shrinking.

Melting Greenland Glacier

Receding Athabasca Glacier in Alberta
It has receded 1.5 km since 1843.

Columbia Glacier c. 1980

Columbia Glacier 2005

Arapaho Glacier 1898

Arapaho Glacier 2003

Some possible effects of the shrinking glaciers.

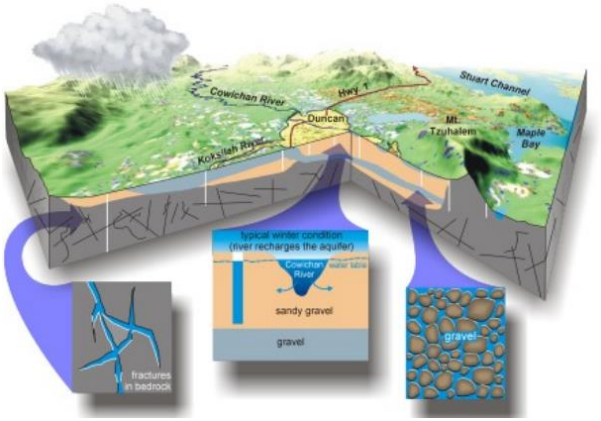
1) Ocean waters may rise, which can be disastrous for coastal Communities.

2) the water could flood rivers that are important sources of water

3) Loss of Habitat for many animals (Polar Bear)

Summary For Sources of Freshwater

Lakes, Ponds and Wetlands



Groundwater

Glaciers

Rivers and Streams

Reading Check

- See page 28, 1, 2, 3, 4, 5

Suggested Activity

- Find Out Activity 1-5 on page 32.

Science 8

Unit 1:

Topic 4: Freshwater Systems Links

Fresh Water System Links

How are the different sources of fresh water, linked together

1) Drainage Basins (watershed) is the area of land that drains into a body of water, such as a river, pond, lake, or ocean.

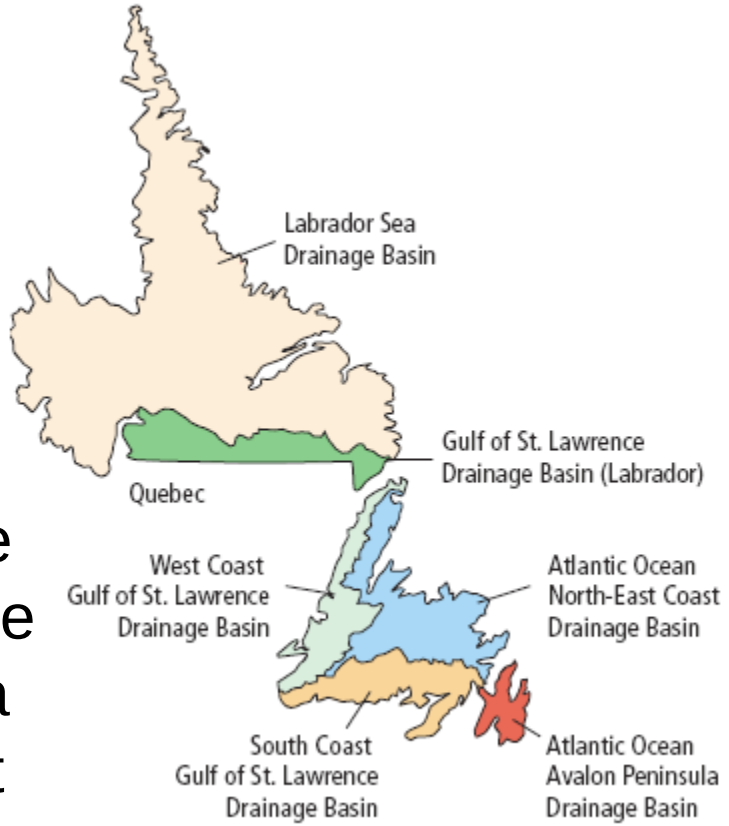
Canada has five major drainage basins

Divide refers to an area of high ground that separates one drainage basin from another

Ex. The Continental Divide

Newfoundland and Labrador has 6 major drainage basins.

1. Labrador Sea
2. Gulf of St. Lawrence
3. West Coast Gulf of St. Lawrence
4. South Coast Gulf of St. Lawrence
5. Atlantic Ocean Avalon Peninsula
6. Atlantic Ocean North-east Coast

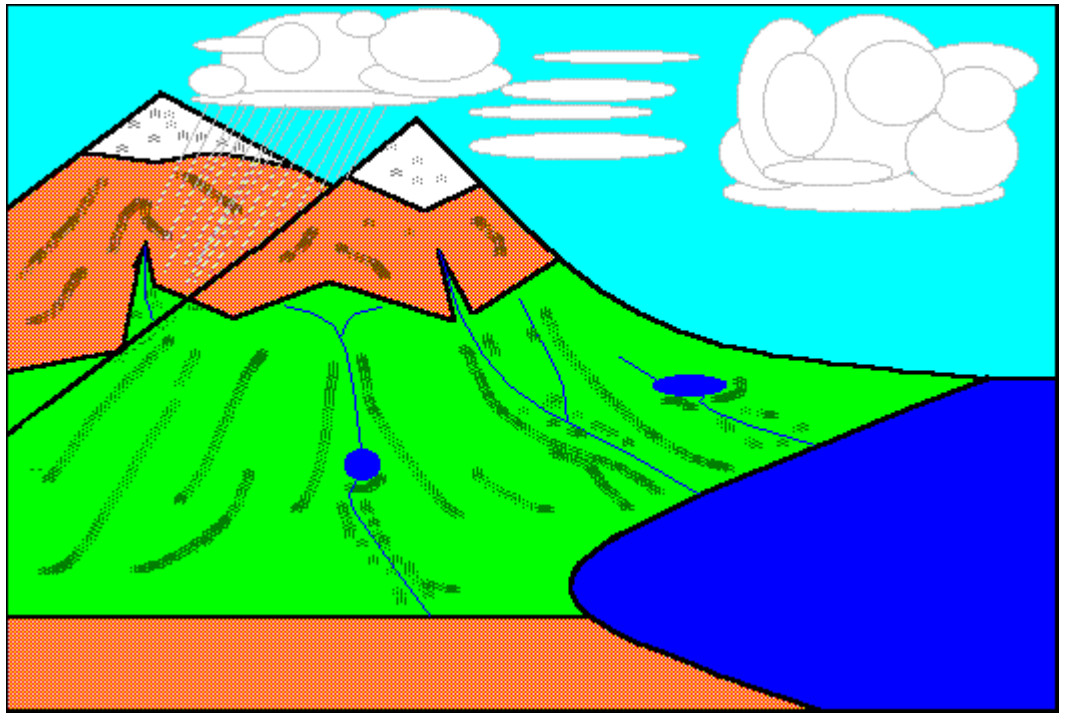


Drainage Basins

Suggested Activity

- Find Out Activity 1-6 on page 33.

2) Run-off refers to water that flows across the earth's surface into streams, rivers and other bodies of water



Factors That Affect Runoff

1) Nature of the ground material

Ground covered in rock = more runoff

Ground mostly soil = less runoff (water absorbed

2) Amount of Rain

Heavy rain mean more runoff

3) Length of time it rains

Longer it rains = > More runoff

4) Slope of the Land

Steeper the land, faster the water will flow

5) Amount of Vegetation

Little vegetation = greater runoff

RUNOFF

Suggested Activity

- Find Out Activity 1-4 on page 31.

Tracking Runoff

Reading Check

- See page 30, 1, 2, 3, 4, 5

Checking

- See page 31, 1, 2, 3, 4, 5