

## Overview

This activity reviews the physical states of water and some properties of soap bubbles.

## Overall Expectations

- Demonstrate an understanding of the three physical states of water.
- Demonstrate an understanding of surface tension.
- Describe what bubbles are.
- Describe why soap bubbles last longer than water bubbles.



## Specific Expectations

### *Understanding Basic Concepts*

- The three physical states of water are solid (ice), liquid (water) and gas (vapour).
- Bubbles are pockets of gases within another substance. Soap bubbles are gasses (air) surrounded by a very thin skin of soap and water. The soap forms an outer and inner skin trapping a very thin layer of water between two layers of soap.
- Because soap evaporates at a much slower rate than water, the layers of soap in a bubble help prevent evaporation and increase the life of a bubble.
- An example of surface tension is water beading up on a raincoat. Water likes to stick to itself and forms a thin skin when it comes in contact with air, oil or another substance. It sticks together, rather than spreads out.

### *Relating Science to the World outside the School*

- Students will recognize the three physical states of water.
- Students will be able to describe and recognize surface tension.
- Students will be able to describe what bubbles are and what factors cause bubbles to burst.

## Curriculum Links

- Grade 2 – Matter and Materials  
*Properties of Liquids & Solids*
- Grade 5 – Matter and Materials  
*Properties of and Changes in Matter*

## Glossary of Terms

### Condensation

The act or process of reducing a gas or vapor to a liquid or solid state.

### Evaporation

The act or process of converting or changing into a vapor with the application of heat.

### Surface Tension

The elastic-like force in a body, especially a liquid, tends to minimize or constrict the area of the surface.

### Vapour

Gas formed by heating a liquid such as water.

## Overview

This activity is designed to show that the flow of water depends on various factors including the medium (sand, gravel, clay) and the pressure it is under (slope of the tube).



## Overall Expectations

- Demonstrate an understanding of slope, porosity and permeability.
- Describe, using their observations, what happens when water runs through different materials.
- Describe, using their observations, what happens when water runs through materials that are the same, but the slope is different.

## Specific Expectations

### *Understanding Basic Concepts*

- Water in a steeply sloped tube is under greater pressure than water in a shallowly sloped tube.
- The slope of the land affects the way water moves underground.
- Different materials in the ground have different permeability's.
- Darcy's Law – when permeability is uniform, the velocity of groundwater increases as the slope of the water table increases.

### *Relating Science to the World outside the School*

- Students will be able to recognize what materials are permeable.
- Students will describe how slope can affect the way water moves underground when the ground is made up of the same material.

## Curriculum Links

- Grade 3 – Earth and Space Systems  
*Soils in the Environment*
- Grade 4 – Earth and Space Systems  
*Rocks, Minerals, Erosions*

## Glossary of Terms

### **Darcy's Law**

When permeability is uniform, the velocity of groundwater increases as the slope of the water table increases.

### **Moisture**

A small amount of liquid that causes wetness.

### **Permeability**

The ability of a membrane or other material that permits a substance (water) to pass through it.

### **Porosity**

The property of being porous, having pores.

### **Slope**

To take a slanting direction, such as a bank sloping down to a river; a piece of slanting ground, such as a hillside; the upward or downward slant, such as that of a roof.

### **Velocity**

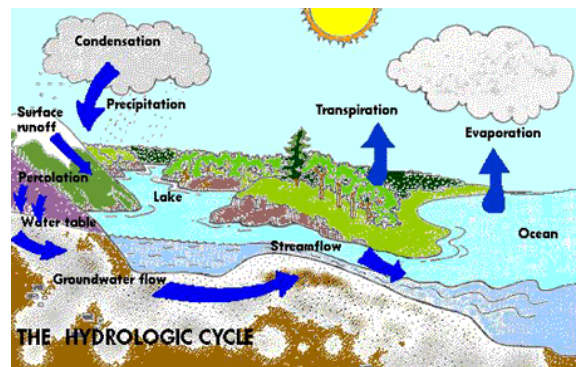
The rate of motion in a particular direction.

### **Water Table**

The upper surface of the zone of saturation of groundwater.

## Overview

This activity is a game that introduces students to the water cycle model. They will learn how the water cycle is a continuous repetition of events—the movement of water molecules from bodies of water, the land and living things, into the air and back again.



## Overall Expectations

- Demonstrate an understanding of how the water cycle works.
- Demonstrate an understanding that with each change in state, physical movement from one location to another usually follows.
- Demonstrate an understanding that the water we drink today was used by dinosaurs a million years ago.

## Specific Expectations

### *Understanding Basic Concepts*

- Water does not disappear but can change in state (i.e. boiling water – condensation).
- Water is continuously recycled throughout the environment.
- There are many sources of water (i.e. lake, precipitation, groundwater, etc.).

### *Relating Science to the World outside the School*

- Students will be able to describe the water cycle.
- Students will be to identify different sources of water.
- Students will be able to describe how we can conserve water and keep our water resources healthy.

## Curriculum Links

- Grade 2 – Earth and Space Systems  
*Air and Water in the Environment*

Grade 2 – Matter and Materials  
*Properties of Liquids and Solids*

## Curriculum Links

- Grade 5 – Earth and Space Systems  
*Weather*
- Grade 5 – Matter and Materials  
*Properties of and Changes in Matter*

## Glossary of Terms

### **Aquifer**

Underground water stored in dozens of reservoir-like layers. Most of the water in aquifers is contained in beds of sand, gravel or other materials and can be pumped to the surface.

### **Cloud**

A visible mass of tiny bits of water or ice hanging in the air, usually high above the earth.

### **Condensation**

The act or process of reducing a gas or vapor to a liquid or solid state.

### **Contamination**

The state of being contaminated by contact or mixture of a substance into the air, water of soil that reduces its usefulness to humans and other organisms in nature.

### **Evaporation**

As water is heated by the sun, it converts or changes into a vapor.

### **Groundwater**

Water that infiltrates into the earth and is stored in usable amounts in the soil and rock below the earth's surface.

### **Hydrologic Cycle**

The cycle of the earth's water supply from the atmosphere to the earth and back which includes precipitation, transpiration, evaporation, runoff, infiltration, and storage in water bodies and underground.

## Glossary of Terms

### **Impurity**

Something that, when mixed into something else, makes that mixture unclean or lowers the quality.

### **Infiltration**

The gradual downward flow of water from the surface of the earth into the soil.

### **Moisture**

A small amount of liquid that causes wetness.

### **Precipitation**

Water droplets or ice particles condensed from atmospheric water vapor and come in the form of rain, snow, sleet and hail.

### **Recharge**

Water being put back into the ground via rainfall or melting snow. It replenishes a water body or aquifer with water.

### **Runoff**

Water (originating as precipitation) that flows across surfaces rather than soaking in. It eventually enters a water body.

### **Saturation**

The state of being infused with so much of a substance (water) that no more can be absorbed, dissolved or retained.

### **Transpiration**

Water vapours that are emitted from plant leaves. Every day an actively growing plant transpires 5 to 10 times as much water as it can hold at once.

### **Water Conservation**

Practices which reduce water use.

## Glossary of Terms

### **Water Cycle**

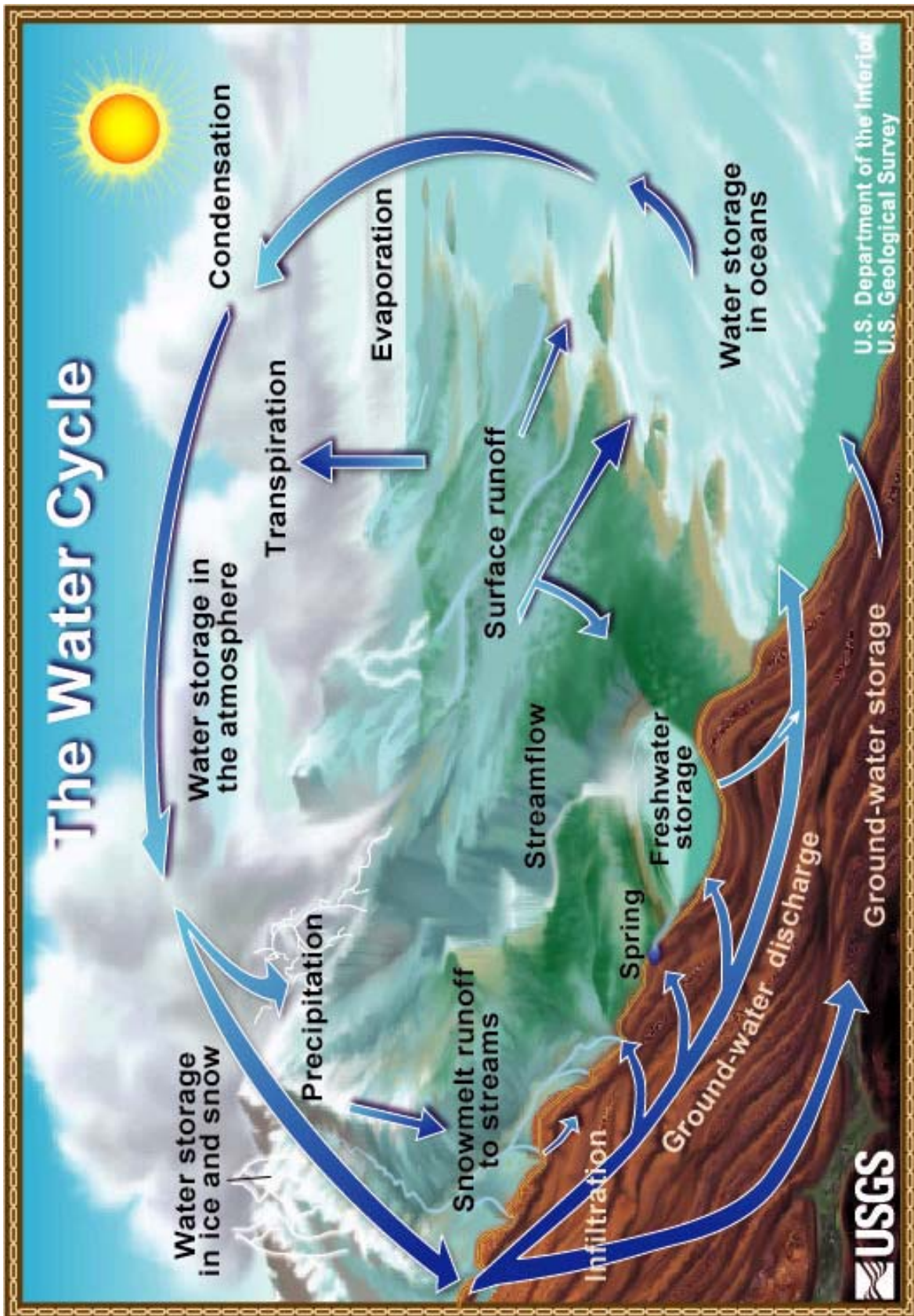
See hydrological cycle.

### **Watershed**

The land area from which water drains to a particular water body.

### **Water Table**

The upper surface of the zone of saturation of groundwater.



## Overview

This activity illustrates the composition of a wetland and the importance it has on the existence of plants, animals and the environment. Students will observe using microscopes, the common microorganisms that are found in a wetland.



## Overall Expectations

- Demonstrate an understanding of what a wetland is.
- Describe how wetlands act as a natural treatment and purification for polluted water.
- Demonstrate an understanding of the dependency of plants and animals on their habitat and the interrelationships of plants and animals living in a specific habitat.

## Specific Expectations

### *Understanding Basic Concepts*

- Wetlands help reduce flooding and erosion during storms.
- Wetlands filter storm water pollutants.
- If we did not have wetlands to serve as filters, many pollutants would not receive treatment and flow directly into the water body.
- Wetlands are important for the existence of plants, animals and the environment.

### *Relating Science to the World outside the School*

- Students will be able to describe the importance of wetlands.
- Students will be to identify how a wetland acts as a filter.
- Students will be able to describe how ecosystems are interrelated.

## Curriculum Links

- Grade 4 – Life Systems  
*Habitats and Communities*

## Glossary of Terms

### **Aquatic Life**

Plants, animals and microorganisms that spend all or part of their lives in water.

### **Bog**

A poorly drained freshwater wetland that is characterized by a build-up of peat.

### **Constructed Wetlands**

Wetlands that are designed and built similar to a natural wetland; some are used to treat domestic, agricultural, industrial and mining wastewater.

### **Depression Storage**

The storage of water in low areas such as puddles, bogs, ponds and wetlands.

### **Ecology**

A branch of science concerned with the interrelationship of organisms and their environments; the pattern of relations between organisms and their environment.

### **Ecosystem**

An ecological community together with its physical environment considered as a unit.

### **Environment**

The sum of all external conditions and influences affecting the development and life of organisms.

### **Erosion**

The wearing away of the earth's surface by running water, wind, and ice; processes, including weathering, abrasion, corrosion and transportation, by which material is removed from the earth's surface.

### **Fill**

Material added to a wetland area to make it suitable for building.

## Glossary of Terms

### **Filtration**

The process of passing a liquid or gas through a porous article of mass to separate out matter in suspension.

### **Flooding**

An overflowing of water, especially over land not usually submerged.

### **Marsh**

An area of low-lying wetland.

### **Microorganism**

Organisms too small to be seen with the unaided eye, including bacteria, yeasts, viruses, and algae.

### **Organism**

Any living being; plants and animals.

### **Pollution**

Contaminants in the air, water, or soil that cause harm to human health or the environment.

### **Restoration**

Reestablishes the character of an area such as a wetland or forest.

## Overview

This activity will have students comparing different rocks from the local environment. They will learn about

## Overall Expectations

- Demonstrate an understanding of the physical properties of rocks and minerals and the effects of erosion on the landscape.
- Describe and recognize the three classes of rocks: igneous, sedimentary, and metamorphic.
- Demonstrate an understanding of how rocks are made.



## Specific Expectations

### *Understanding Basic Concepts*

- Describe the three classes of rocks: igneous, sedimentary, and metamorphic.
- Understand how different earth materials are affected by moving water.
- A cuesta is a ridge composed of rock strata with a long slope on one side and a steep cliff on the other.

## Relating Science to the World outside the School

- Students will be able to describe how water can cause significant changes in the landscape.
- Students will be to identify the three classes of rocks.
- Students will be able to describe the Rock Cycle.

## Curriculum Links

- Grade 3 – Earth and Space Systems  
*Soils in the Environment*
- Grade 4 – Earth and Space Systems  
*Rocks, Minerals, and Erosion*

## Glossary of Terms

### **Core**

The center of the Earth, made of heavy metals.

### **Crust**

The outer, rocky layer of the Earth.

### **Crystal**

The special shape in which many minerals form. A crystal has fixed properties and the sides are usually flat and regular.

### **Conservation**

The act of using the resources only when needed for the purpose of protecting from waste or loss of resources.

### **Dinosaurs**

The group of now extinct reptiles that lived between 230 and 65 million years ago.

### **Erosion**

The wearing away of the earth's surface by running water, wind, and ice; processes, including weathering, abrasion, corrosion and transportation, by which material is removed from the earth's surface.

### **Fossil**

The remains, or traces, of animals and plants usually preserved in rocks.

### **Gemstone**

A mineral that is valuable because of its beauty, often worn in a piece of jewelry.

### **Geologist**

Someone who studies rocks and fossils to learn more about the Earth's history.

### **Igneous Rocks**

Rocks that are formed from cooling magma.

## Glossary of Terms

### **Lava**

The hot, melted rock that pours out of an erupting volcano.

### **Magma**

The hot, liquid rock deep in the Earth's crust, that becomes lava on the surface.

### **Metamorphic Rocks**

Metamorphic rocks are igneous or sedimentary rocks that have been transformed by great heat or pressure.

### **Mineral**

A compound or an element that forms crystals. All rocks are made from minerals.

### **Rock**

A mass of mineral material, that may or may not be solid.

### **Rock Cycle**

Rocks are constantly being formed, worn down and then formed again.

### **Sedimentary Rocks**

Rocks that are formed from bits and pieces of rock and sand (sediments) that settle on the bottom of the lake or ocean and rivers.