

# 4th Grade Science Study Guide

## Environments

Utah has diverse plant and animal life that is adapted to and interacts in areas that can be described as wetlands, forests, and deserts. The characteristics of the wetlands, forests, and deserts influence which plants and animals survive best there. Living and nonliving things in these areas are classified based on physical features.

## Vocabulary

adaptation: the structure, behavior, or other trait in an organism that helps it to survive in its environment

amphibian: an animal that lives near water and as an adult has lungs

bird: animal with feathers

coniferous: evergreen plants that stay green all year and never lose their leaves

deciduous: plants which lose their leaves in the fall and grow new leaves in the spring

desert: an area of land that receives less than ten inches of rainfall a year

fish: a scaly animal that lives in the water

forest: a large area of land that is covered with trees

hibernation: an inactive, sleep-like state during the winter

insect: small, six-legged animal with three body parts, wings and antennae

invertebrate: an animal without a backbone

mammal: animal with fur or hair that gives birth to live young

migration: seasonal movement of animals from one place to another

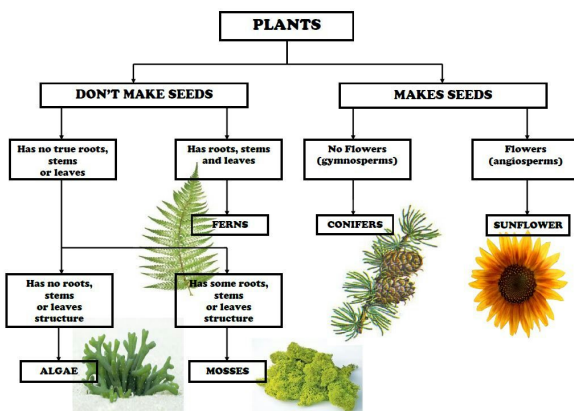
reptile: cold-blooded animals with a backbone and scaly skin

vertebrate: an animal with a backbone

wetland: a low area where the land is soaked with water

Common plants: sagebrush, pinyon pine, Utah juniper, spruce, fir, oak brush, quaking aspen, cottonwood, cattail, bulrush, prickly pear cactus

Common animals: jackrabbit, cottontail rabbit, red fox, coyote, mule deer, elk, moose, cougar, bobcat, deer mouse, kangaroo rat, muskrat, beaver, gopher snake, rattlesnake, lizard, tortoise, frog, salamander, red-tailed hawk, barn owl, lark, robin, pinyon jay, magpie, crow, trout, catfish, carp, grasshopper, ant, moth, butterfly, housefly, bee, wasp, pill bug, millipede



### Reptiles, amphibians and fish

**REPTILES** are vertebrate animals, they are oviparous, they have lungs to breathe and they have their bodies covered with scales.

- Reptiles body is divided in: head, trunk, limbs(extremities) and tail.
- Reptiles can move in many different ways: snakes don't have limbs and they slither(slide), marine turtles swim and lizards, walk.
- Reptiles usually lay eggs, and they are cold blooded.

**AMPHIBIANS** are vertebrate and oviparous, and they have moist smooth skin.

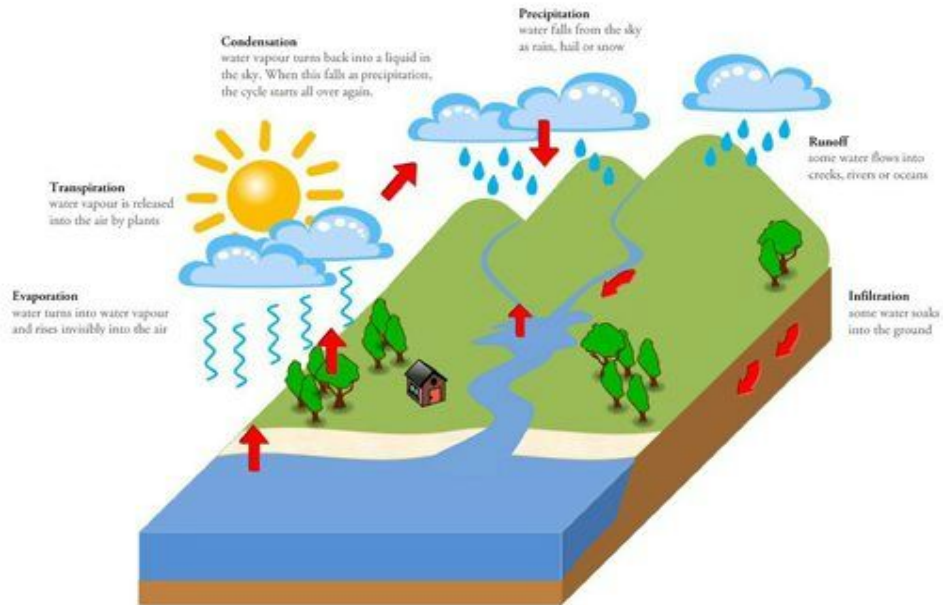
- Amphibians body is divided in: head, trunk and limbs. Some, like frogs, don't have tail, others, like salamander, do have tail.
- When young amphibians are young they are very different from their parents, they change a lot. These changes are called metamorphosis.
- They live in water and land, they breath with gills and lungs. They are cold-blooded.

**FISH** are vertebrate, oviparous, they breath with gills and their body is covered with scales.

- Fish body is divided in: head, trunk, tail and some fins to swim.
- They can breath under water using gills to take the oxygen dissolved.
- They are cold-blooded. They lay many eggs.

# Water Cycle

Matter on Earth cycles from one form to another. The cycling of matter on Earth requires energy. The cycling of water is an example of this process. The sun is the source of energy for the water cycle. Water changes state as it cycles between the atmosphere, land, and bodies of water on Earth.



## Changes of State

When water changes state in the water cycle, the total number of water particles remains the same. The changes of state include melting, sublimation, evaporation, freezing, condensation, and deposition. All changes of state involve the transfer of energy. Figure 1 shows how the water particles in each state behave as energy is added or removed.

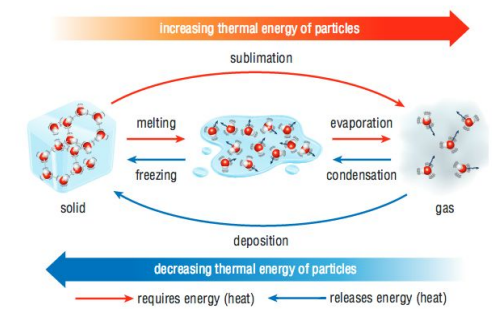


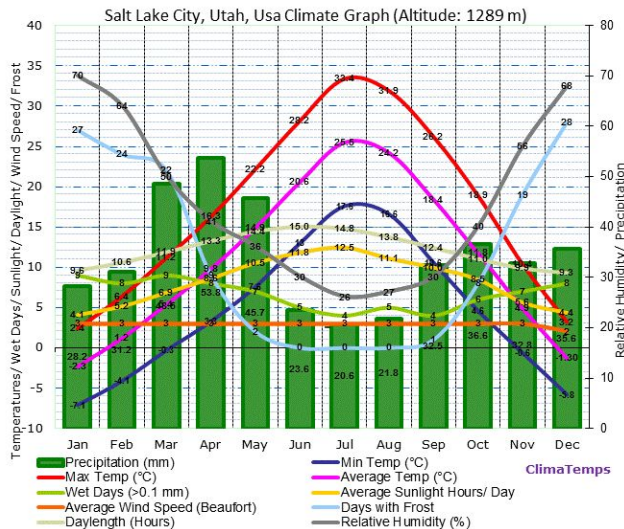
Figure 1 Energy is gained or lost whenever water changes state.

## Vocabulary

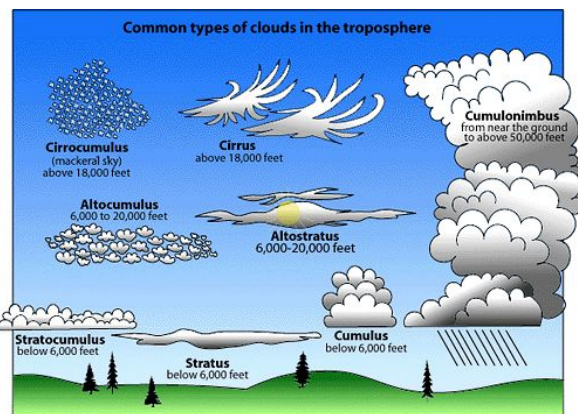
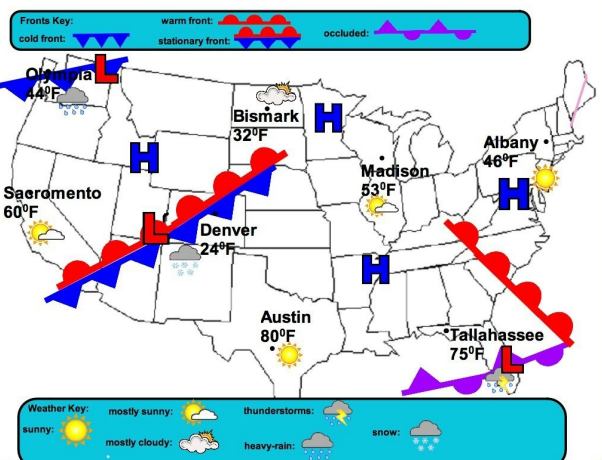
clouds: a collection of millions of tiny water droplets or ice crystals  
condensation: water vapor that cools and changes back into a liquid  
dew: condensation that occurs outdoors due to warmer air striking a colder surface  
evaporation: the change of a substance from a liquid to a gas (vapor)  
precipitation: any form of water that falls from clouds onto Earth's surface  
temperature: a measurement of how hot or cold something is  
water cycle: continuous movement of water into the air and ground, onto and over land, and back  
vapor: liquid in the air in the form of a gas

## Weather

Weather describes conditions in the atmosphere at a certain place and time. Water, energy from the sun, and wind create a cycle of changing weather. The sun's energy warms the oceans and lands at Earth's surface, creating changes in the atmosphere that cause the weather. The temperature and movement of air can be observed and measured to determine the effect on cloud formation and precipitation. Recording weather observations provides data that can be used to predict future weather conditions and establish patterns over time. Weather affects many aspects of people's lives.



<b>Anemometer</b>	An instrument used to measure wind speed.	
<b>Thermometer</b>	An instrument used to measure temperature.	
<b>Hygrometer</b>	An instrument used to measure humidity = the amount of water vapor in the air.	
<b>Wind Vane</b>	An instrument used to show the direction of the wind.	
<b>Barometer</b>	An instrument used to measure atmospheric pressure = high and low pressure.	
<b>Rain Gauge</b>	An instrument used to measure rain.	



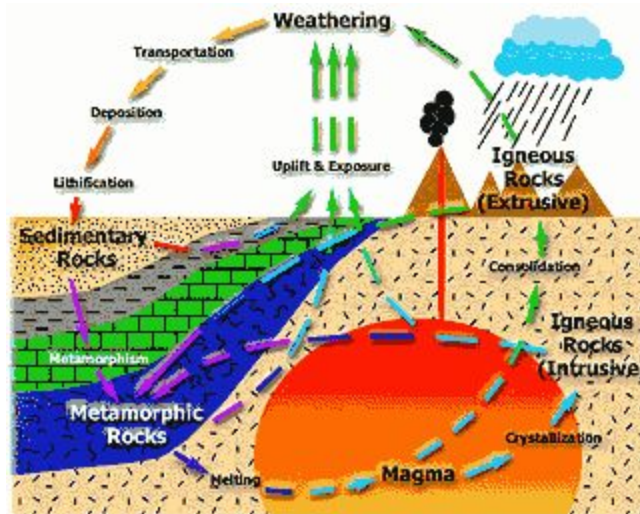
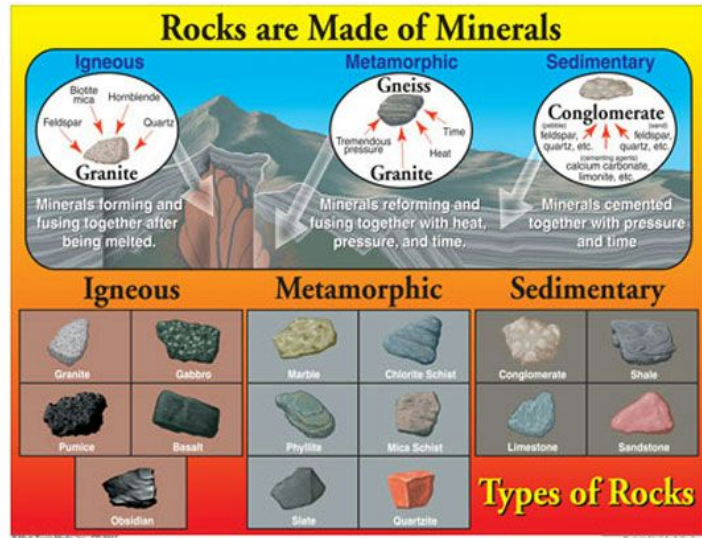
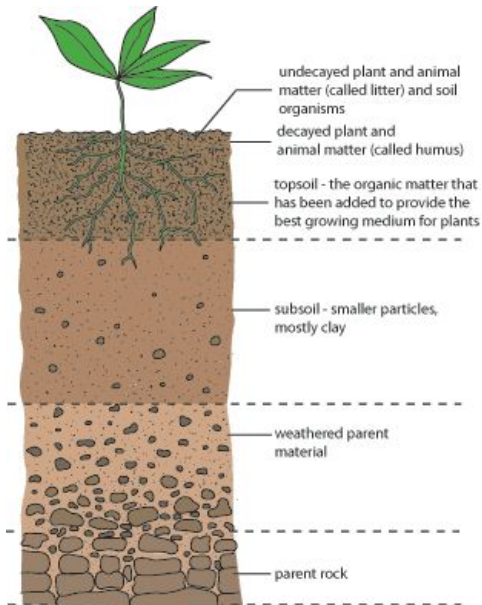
## Vocabulary

accurate: correct  
air pressure: the weight of air on Earth's surface  
air temperature: how hot or cold it is  
atmosphere: air around Earth  
barometer: an instrument that measures air pressure  
cirrus: thin, wispy clouds  
cumulus: thick, puffy clouds  
freezing: temperatures at or below 0°C or 32°F  
forecast: predictions  
meteorologist: a scientist who studies weather  
phenomenon: an unusual event or fact that can be seen or sensed  
precipitation: water that falls from clouds in the form of rain, snow, hail or sleet  
rain gauge: a container set outside to measure the amount of precipitation during a storm  
severe: harsh or unusual  
seasonal: normal for the time of year  
stratus: layered clouds  
thermometer: device used to measure temperature  
wind speed: how fast the air is moving



## Rocks and Soil

Earth materials include rocks, soils, water, and gases. Rock is composed of minerals. Earth materials change over time from one form to another. These changes require energy. Erosion is the movement of materials and weathering is the breakage of bedrock and larger rocks into smaller rocks and soil materials. Soil is continually being formed from weathered rock and plant remains. Soil contains many living organisms. Plants generally get water and minerals from soil.



## Vocabulary

**bedrock:** solid rock that lies underneath the subsoil that has not yet been broken down

**erosion:** the movement of rock fragments from one place to another

**freeze:** turn to ice

**igneous:** rocks that are formed when magma, or melted rock from deep inside Earth, rises and cools

**metamorphic:** a rock that has been changed by heat and pressure

**minerals:** solid materials formed in nature that have a specific crystal structure

**nonliving:** never lived

**nutrients:** substances that organisms need in order to survive and grow

**organisms:** living plant or animal life

**sedimentary:** rocks formed from sediments that have settled into layers

**soil profile:** a side view "slice" of the different layers of Earth

**structural support:** help to anchor a plant

**subsoil:** the layer below the topsoil

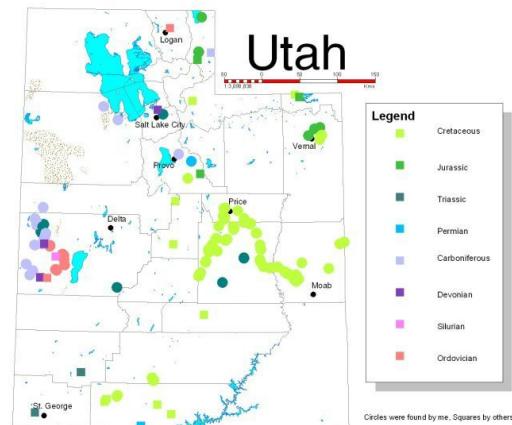
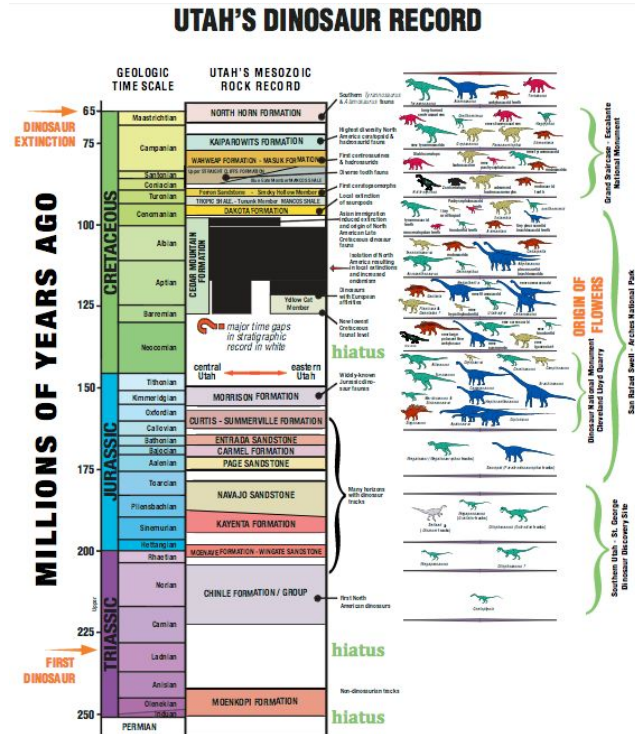
**thaw:** melt

**topsoil:** the top layer of soil that contains living organisms and nonliving things

**weathering:** the breaking down of rocks into smaller pieces called sediments

## Fossils

Fossils are evidence of living organisms from the past and are usually preserved in sedimentary rocks. A fossil may be an impression left in sediments, the preserved remains of an organism, or a trace mark showing that an organism once existed. Fossils are usually made from the hard parts of an organism because soft parts decay quickly. Fossils provide clues to Earth's history. They provide evidence that can be used to make inferences about past environments. Fossils can be compared to one another, to living organisms, and to organisms that lived long ago.



## Vocabulary

climate: a pattern of weather over a period of time

dinosaur: an extinct organism

environment: the surroundings and conditions in which an organism lives

extinct: no longer exists

extinction: loss of an entire type of organism

fossil: the remains or evidence of an ancient organism

impression: a mark or design made on a surface by pressure

infer: a process of reasoning from something known or assumed

mineral: a natural solid material that has a particular crystal structure

organism: a living thing that carries out basic life functions on its own

prehistoric: belonging to a period of time before recorded history

preserved: kept from harm or change

replacement: the process of an organism's hard parts being dissolved and replaced by other minerals

sedimentary: formed from mud, sand, small pieces of rock or other sediments that are pressed and naturally cemented to form a rock

trilobite: an extinct ocean shellfish

tropical: very hot and moist climate