

**Science Benchmark: 04 : 05**

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.

**Standard V:**

Students will understand the physical characteristics of Utah's wetlands, forests, and deserts and identify common organisms for each environment.

**Shared Reading**

**Utah: A Great Place to Live!**

In Utah there are three types of environments: *wetlands*, *forests* and *deserts*. The characteristics of each of these determine what plants and animals survive best there. Most plants and animals have *adaptations* that help them survive in their environment. The environment that is found in an area often depends on its elevation (height above sea level). High elevations such as mountain tops are often colder and receive more precipitation than lower lying desert valleys. Some organisms can live in more than one environment, while others can survive in only one. Each of these areas are fascinating to learn about.

**Wonderful Wetlands**

It is late afternoon. The sun is sinking, and the water trickles down the slow-moving river. On the banks of the river are tall grasses. Brown fuzzy cattails blow in the breeze as insects buzz nearby. As you look very closely at the water's edge, you see a very unusual insect that seems to be skating on top of the water. The sounds of birds chirping and twittering are heard from the trees along the river. Small birds dart and skim over the water,



Wetland

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

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

**forest** : *an area of land that is covered with trees*

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

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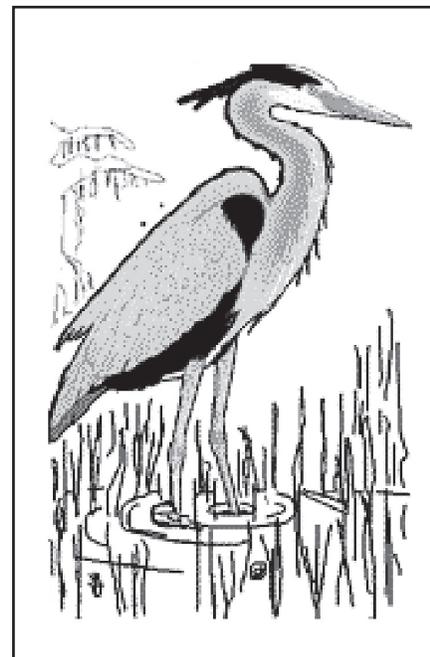
and a larger one glides overhead. There are many interesting plants growing near the river: some with delicate white flowers and others with bright purple furry blossoms; some that have bristles and others that feel as soft as feathers. On the bottom of the river, plants can be seen bobbing up and down with the gently moving water. Even with the hum of activity all around, this is a place of great beauty and peace. This is a wetland.

The wetland is wet most of the year because the soil soaks up water and holds it. Most wetlands lie between dry land and open water, along rivers, lakes, streams, or places where the land is low. Wetlands may not always appear wet because of the tall plants, or low water level. Regardless of a wetland's size or where it is found, there are three things they all have in common: water, wet soil and water-loving plants. Only special kinds of plants can live in soil that is always wet. Wetlands are found throughout Utah. Many of them are marshy areas around the Great Salt Lake where streams of fresh water flow slowly into the lake. The warm temperatures of these marshes are very favorable to wildlife. In places where the temperatures are colder there are fewer plants and animals that can survive, such as in the high mountain areas of Utah.

The amount of water a wetland receives is very important. If there is too little rain or too little water coming into a wetland, it will dry up. If there is too much rain or flooding, it can damage the wetland habitat and threaten the lives of the animals living there. A healthy wetland has a good balance of precipitation and dry weather.

People have discovered that wetlands have valuable resources for a healthy environment. They are great places to learn and enjoy. They also help control flooding, clean the water, are rich in natural resources, and are the home for more living things than any other habitat.

The wetlands of Utah are rich in natural resources and plants. Large numbers of *fish*, *insects*, *birds*, and other animals live there. They depend upon the wetland habitat to supply them with food, shelter and water. Many animals rely on the protection and security of the large number of plants for raising their young. The wetlands are also used by thousands of migrating birds as nesting and resting places.



Wetland bird

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**bird** : *an animal with feathers*

**fish** : *an animal that lives in the water*

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

Plants that live in wetlands are: cattail, (long-leafed plant with stiff sticks containing brown fuzzy sections that look like a cat's tail), and bulrush (spiked leafy plant that clusters together and sometimes has flowers with six bristles). These two wetland plants root in the soil of shallow water. They are often seen growing along lakes, rivers and marshes. These tall plants provide food and protection for wildlife living in the wetlands. Some birds build their nests above ground on these plants so they can hide from their predators. The roots of cattails are the main food source for muskrats.

If you spent your life in the water or on the wet ground of the wetlands, you would need special body parts. The beaver is a wetland animal with unique adaptations for this environment. Beavers have thick coats of fur with an oily covering, a layer of fat under the skin, and a special circulation system that helps keep them warm during summer and winter. Did you know when a beaver hears running water, it begins to build a dam of mud and wood to stop the flow? Stopping the water changes the environment and begins to create a wetland.

Beavers are master builders and use their long front teeth for gnawing on aspen trees. They eat the top tender leaves and use the rest to build their lodges. They also store a supply of small trees, branches, and twigs at the bottom of their homes to help them survive the winter months. A beaver's back feet are webbed for swimming. Beavers can stay underwater for up to fifteen minutes! The front paws, much like human hands, are made for holding food, working on dams and digging. Beavers use their broad flat tails to steer when swimming, for support when sitting, and to slap the water as a warning to others when danger is near.

There are many other animals that have adapted to the wetland habitat. Muskrats use cattails for food and for building lodges. Moose feed on many wetland plants and grow a thicker coat of fur before winter to survive the cold temperatures in high mountain elevations. Tiger salamanders live in the moist areas around streams and burrows beneath the ground to escape the extreme temperatures of summer and winter. Frogs go into *hibernation* at the bottom of streams and ponds where water does not freeze. Birds of the wetlands are also well adapted to this habitat with bills or beaks designed to catch fish, small animals, or insects that live in the wetlands.

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

The Great Salt Lake is a unique wetland because of its salty water. The lake is one of the saltiest bodies of water in the world and can be up to eight times saltier than the ocean. Only a few animals are able to live in the Great Salt Lake because of the salty water. Brine shrimp and brine flies are two insects that live in the lake. Brine shrimp hatch from tiny eggs which float on top of the water. One hundred and fifty eggs can fit on the head of a pin! They are *invertebrates* that only grow to one-fourth inch long and feed on very small life forms. These insects have adapted to the salty water of the Great Salt Lake. As a brine shrimp drinks the water, the salt is removed from its body through the gills.

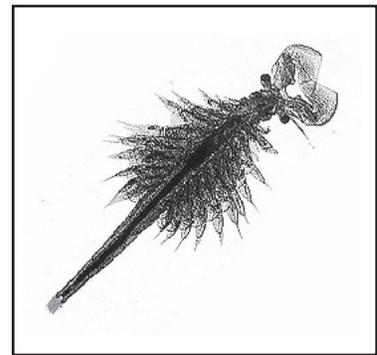
Brine flies also live in the Great Salt Lake. The adult flies group together on the shore of the lake. There can be 370 million per mile off the beach. These tiny insects do not bite, but can be very annoying.

The *migration* of huge numbers of birds, such as geese, ducks, pelicans, and gulls can be seen during the warmer months of the year at the Great Salt Lake. Both brine shrimp and brine flies serve as food for millions of birds that migrate to the wetlands areas around the Great Salt Lake.

Most of the wetlands of Utah are found around the Great Salt Lake. Marshes have formed where rivers and streams bring freshwater into the lake. Although there are very few living things that can live in the salty water of Great Salt Lake, there are many plants and animals that make their home in the marshes near the lake. In the spring, thousands of birds migrate to Utah and live in the freshwater marshes of Great Salt Lake.

The great blue heron is one of the largest birds that live in the marshes of the Great Salt Lake. It has long thin legs and stands very still until it spies something to eat. The great blue heron uses its long pointed bill to catch fish, frogs, or snakes. When the weather gets cold, these birds migrate to warmer areas.

The wetlands of Utah are a valuable resource to control flooding and help to keep our water clean. They are the home to many plants and animals. They also provide beauty and enjoyment for many people.



brine shrimp

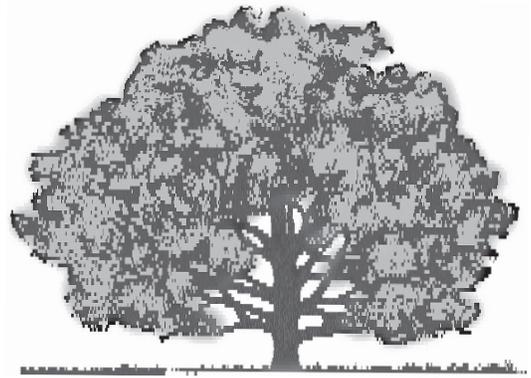
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**invertebrate** : *an animal without a backbone*

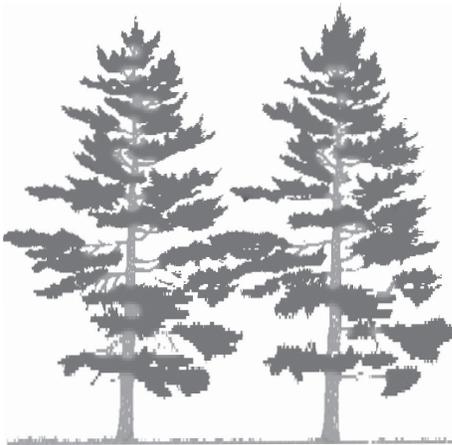
**migration** : *seasonal movement of animals from one place to another*

## Fantastic Forests

Every summer people look forward to family camp-outs in forests. The drive up the canyon is beautiful and cool. Trees seem to whiz by. Animals are seen off in the distance. The shady slope of the mountain that faces north is covered with aspen trees. Aspen trees are *deciduous*. When the weather gets colder the leaves turn a brilliant color of yellow before falling to the ground. The trunks of the trees are white with grayish black marks running through the bark. Not only do birds use the aspen for nesting, but some animals also use it as food.



Deciduous Tree



Coniferous Tree

On the mountain slope that faces south, the hot rays of the sun warm the ground. This side of the mountain is drier with grasses, sagebrush and only a few trees growing. Most of the trees are Utah juniper trees. They are *coniferous*. The needles of the coniferous trees use less water than the broader leaves of deciduous trees. The scrub oak tree, a deciduous tree, is also found on the drier south slope. Scrub oak do not get very tall. They drop acorns in the fall that many animals eat.

The porcupine is a forest animal that feasts on the leaves and branches of the quaking aspen. It also eats the bark of the trees to survive the winter months. It weighs about 40 pounds and is an excellent climber. The porcupine's body is covered with quills that are weapons used for protection against coyotes, bobcats, and other predators. When a porcupine becomes frightened, it shakes its body. Loose quills come out and stick into the attacker's skin.



Porcupine

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

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

Mule deer live on the slopes of the mountains and eat plants, such as aspens, junipers, and sagebrush. They can be difficult to spot when they stand very still among the trees. Although the mule deer prefer to stay in higher elevations, during the winter they will migrate to lower elevations near the valley.

As your drive continues up the canyon, ponderosa pine trees are now mixed in with the aspen trees. The ponderosa pine is one of the most common trees of the Rocky Mountains and has adapted to dry, cold climates.

Still further up the canyon, there is a campsite waiting. It is tucked in the shadows of giant spruce and fir trees. These trees are tall and narrow, so in the winter the snow will slide off the branches without breaking them. They grow close together, protecting one another from the wind. Pine cones and pine needles are scattered on the ground under the huge trees. The air smells cool and moist.



Mount Rainier

Wild animals are fun to watch in the forest. Squirrels are furry-tailed little animals that scamper about on the ground or in trees looking for berries, nuts and seeds. They store their food in holes in the ground or trees. They are especially busy in the autumn gathering food for the winter. They stay in their dens on cold days where they sleep and nibble on the food they have stored. Animals of the forests are able to adapt to different foods during different seasons.

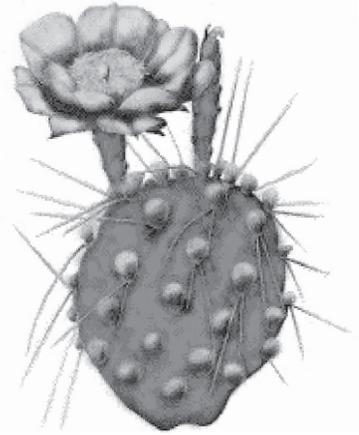
In the forest, there are always interesting things to see. It is exciting to see a moose eating in a marsh. They are huge and can move rapidly. When the wild flowers bloom, bees, butterflies, and hummingbirds busily collect nectar. There are many insects in the forest that are fascinating to watch. There are common insects such as houseflies and ants, but there are also many strange-looking insects.

Just like the wetlands, forests are very important. Forests help to reduce gases that are put into the air from cars and factories. In return, the trees give out large amounts of oxygen that we breathe. Forests also help keep our water clean and prevent soil erosion. When it rains in the forests, the leaves allow the water to slowly drip to the ground and the roots hold the soil in place. However, when a forest is cut down, the rain falls on the unprotected soil and dirt is washed into the streams making them dirty. The water is then unhealthy for fish and other living things.

Over the years forests have been cut down for lumber, golf courses, shopping malls and many other things. People have learned that when the trees disappear, so does everything that depends on them, from tiny insects to large animals. However, with careful planning we can protect the forests so we can continue to enjoy this beautiful and peaceful habitat.

## Dazzling Desert

Take a look outside. What is it like where you live? You may see grass, large pine trees, or green leafy trees around your school and neighborhood. The water we use for these plants comes from streams, rivers, lakes, and deep underground wells. This is how people living in Utah maintain their beautiful yards and gardens. Yet, Utah is the second driest state in the United States. Nevada is the driest. Imagine if all of the water sprinklers were shut off for several years. The environment would look much different because many of the trees and other plants would die. Eventually, plants that are adapted to drier climates would return. Most of Utah's natural state is desert.



Cactus

Throughout the desert of Utah, there are a large variety of plants that survive through long hot summers and cold winters. Many plants have small leaves that need less water; while others store water in their leaves, stems and roots.

The prickly pear cactus has adaptations to help it survive the hot desert habitat. The leaves have thick waxy covering which helps keep the water inside the plant longer. The spines of needles on the cactus protect it from sun and wind. The prickly pear cactus blossoms in the spring with pink, yellow, and orange blossoms providing nectar for bees and moths.

Sagebrush is a very common desert plant throughout Utah. It grows about four feet tall and gives off a very strong odor. Sagebrush is used by some animals for shade, protection from predators, and food for mule deer, caterpillars, and other animals. When land is cleared for houses or other buildings, sagebrush is destroyed. It is very slow to reproduce, and animals that depend on sagebrush die.

Other plants that are often found in dry areas are scrub oak cactus, Utah juniper, and pinyon pine. They provide shelter, food and protection for many desert animals. Although the desert is a very dry climate, many animals have adapted to this habitat. The desert animals include insects, spiders, reptiles, birds, and mammals. Many animals find cooler places to stay during the hot hours of the day. They burrow into the ground or find shady spots by rocks or plants. Some animals of the desert do not require large amounts of water. They get the water they need from plants or possibly from a water hole.

The jackrabbit is a common desert animal of Utah. To keep out of the sun on hot days, the jackrabbit stays hidden under shrubs or near clumps of grass. They also lose body heat through their very large ears to keep cool. The jackrabbit uses “ear-conditioning” to lose one-third of its body heat. In the cooler morning and evenings it feeds on prickly pear cactus. The jackrabbit can run up to 35 miles per hour to escape predators such as coyotes, foxes and large snakes.

*Reptiles* such as snakes and lizards are important to the desert habitat. A rattlesnake lives in rocky areas and stays in the shade of a tree or bush during the day. However, at night it becomes very active as it hunts for food. The rattlesnake usually bites a small animal, such as the kangaroo rat, with its poisonous fangs, and swallows the animal whole. To survive the winter, rattlesnakes hibernate within a large group in underground holes. The desert tortoise lives in the hot desert. It moves very slowly across the desert sand. Prairie dogs dig holes and burrow under the ground, where it is cooler. Both the desert tortoise and the prairie dog are endangered and protected by laws.



lizard

### **We have class!**



bear

Have you ever wondered why a tuna is known as a fish, yet a whale is known as a mammal? Scientists have developed a way to group living things. This system is known as classification and it shows relationships between living things that are alike in some ways. Classification requires us to look at similar characteristics in organisms. You can look at the outward appearance or look inside the organism's body. Outward appearances can include the texture, shape, size and color of an animal. If you look at a group of bears, you could classify them by the color of their fur. Black bears and brown bears are found in Utah.

Some animals cannot be classified by outward appearance. Scientists must also look inside the animal. For example, the skeleton and the way bones are joined are clues to classify or group animals. A whale has many internal parts that are the same as other mammals. Even though whales live in the ocean, they look more like mammals on the inside than they do a tuna fish.

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**reptile** : a cold-blood animal with a backbone and scaly skin

There are two large groups of living things on Earth: plants and animals. Think of some ways plants and animals are different or alike. How do you know if you are an animal or a plant? You know you are not a plant because plants are green organisms that cannot move by themselves. Some have flowers and leaves, and they can make their own food from sunlight, air and water. There are many kinds of plants.

Scientists must look inside animals to classify them into groups. Most animals can be divided up into two main groups: vertebrates and invertebrates. *Vertebrates* are animals that have a backbone. The backbone supports the whole body. Examples of animals that are vertebrates are humans, fish, horses, snakes and whales.

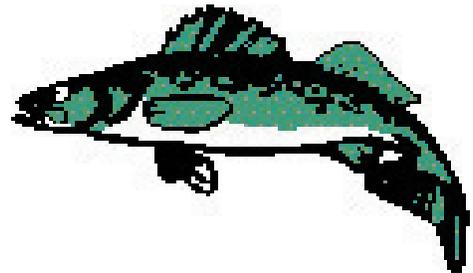
Animals that do not have a backbone are called invertebrates. Some invertebrates have a hard outer shell such as crabs, crayfish, snails, insects, and spiders. The shell protects and supports their bodies. A worm is an invertebrate that does not have any bones or shell for its body.

We can classify animals into two more groups: cold-blooded and warm-blooded animals. A cold-blooded animal's body temperature will change with the temperature of its surroundings. A snake's body temperature could get as low as 40° F at night because the night air is at 40° F. In the morning when the sun comes out, a snake will move to an open space and warm its body with the sunlight.

This will make the snake's body temperature rise as the temperature in the air rises.

Warm-blooded animals will maintain the same body temperature no matter what temperature surrounds their bodies. Your normal body temperature stays at 98.6° F. It does not drop very low or go extremely high no matter what the temperature is outside.

Using characteristics such as the presence of a backbone and whether an organism is warm or cold blooded has led scientists to develop animal groups. Most of the animals you know about are either a bird, mammal, insect, fish, reptile or amphibian. Use the chart on the next page to see what each group is like.



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**vertebrate** : *an animal with a backbone*

Characteristics of Organisms	Examples that Live in Utah
<b>Birds:</b> warm-blooded, hatch from eggs, feathers cover their bodies, two legs and two wings	Red-tailed hawk, barn owl, lark, robin, pinyon jay, magpie, crow
<b>Mammals:</b> warm-blooded, give birth to live young, provide milk for babies, fur or hair body covering, four limbs, large brains	Jackrabbit, cottontail rabbit, red fox, coyote, mule deer, elk, moose, cougar, bobcat, deer mouse, kangaroo rat, muskrat, beaver, gopher
<b>Insects:</b> cold-blooded, six legs, three body sections	Grasshopper, ant, moth, butterfly, housefly, bee, wasp, pill bug, millipede
<b>Fish:</b> cold-blooded, hatch from eggs, breathe through gills, live in water, scales cover their bodies	Catfish, carp, trout
<b>Reptiles:</b> cold-blooded, hatch from eggs laid on land, scales cover their bodies	Gopher snake, rattlesnake, lizard, tortoise
<b>Amphibians:</b> cold-blooded, hatch from eggs, smooth moist skin, start life with gills that change to lungs	Frog, salamander

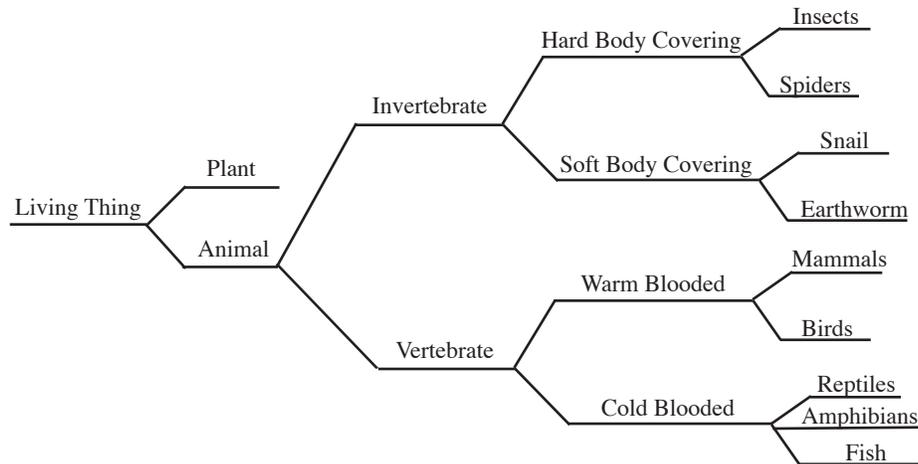
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**amphibian** : *an animal that lives near water and as adult has lungs*

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

## Classifying diagrams

Scientists use tools to classify organisms. Below is a diagram we can use to classify a lizard. Look at the picture of a lizard on a previous page. You may already know what group a lizard is in, but, let's try to use the system to find out.



Find “living things” and follow the line to the next choice. Would you say a lizard is a plant or an animal? It moves and needs to find its own food so it must be an animal. Follow the line until there are two choices again. Now we must decide if our object is an invertebrate or a vertebrate. If we could look inside the lizard we would be able to see a backbone. So, the lizard is a vertebrate animal. Follow the line from vertebrate to the next two choices.

The two choices are warm and cold-blooded. How does our lizard warm its body? It will move to a warm area to warm its body and cool its body by moving to a cooler area. This is a characteristic of a cold-blooded animal.

From cold-blooded there are three choices. Look closely at the lizard. What kind of external structures does it have? Did you notice that there are no gills or fins and it does not live in water? So, this object is not a fish. Our lizard does not have wet, smooth skin either. Notice that the lizard has scales on its skin which is characteristic of reptiles. Based on our classification system, the lizard belongs to the reptile group. Correctly classifying living things helps us to understand how they are related. It gives us a way to group and name them. It gives us a chance to observe and study animals and plants.

## Science Language Students Need to Know and Use

1. **adaptation:** the structure, behavior, or other trait in an organism that helps it to survive in its environment
2. **amphibian:** an animal that lives near water and as an adult has lungs
3. **bird:** animal with feathers
4. **coniferous:** evergreen plants that stay green all year and never lose their leaves
5. **deciduous:** plants which lose their leaves in the fall and grow new leaves in the spring
6. **desert:** an area of land that receives less than ten inches of rainfall a year
7. **fish:** a scaly animal that lives in the water
8. **forest:** a large area of land that is covered with trees
9. **hibernation:** an inactive, sleep-like state during the winter
10. **insect:** small, six-legged animal with three body parts, wings and antennae
11. **invertebrate:** an animal without a backbone
12. **mammal:** animal with fur or hair that gives birth to live young
13. **migration:** seasonal movement of animals from one place to another
14. **reptile:** cold-blooded animals with a backbone and scaly skin
15. **vertebrate:** an animal with a backbone
16. **wetland:** a low area where the land is soaked with water