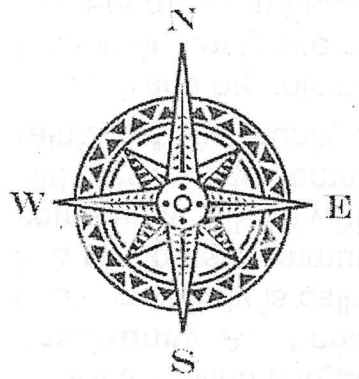
Where on Earth Are You?

Cross-Curricular Focus: History/Social Sciences



The four cardinal directions are shown on a magnetic compass. They are north, south, east and west. The same four directions are also on a map. If you learn the cardinal directions, they can help you find where you are on a map.

A compass rose is a printed symbol that shows these directions. It can help you understand maps. A compass rose is usually drawn as art, with designs and details to make it beautiful. This is especially true on very old maps.

Another way to identify your exact location is to use lines of **latitude** and **longitude**. They are both imaginary lines that circle around Earth. Lines of latitude circle the Earth running east and west. Lines of longitude circle the Earth running north and south. Together, these lines form squares. It's like the lines you see on graph paper. If you look closely on most maps, you will see this graph paper printed on top of the map. If you look even closer, you will see numbers written by the lines. These numbers help to give addresses to places on Earth. The address for each place is known as its **absolute location**.

The **equator** is the main line of latitude that circles Earth. It is the same distance from the North Pole as it is from the South Pole. The equator is the starting point for measuring degrees of latitude. Each line of latitude is marked with a number that says how many degrees north or south of the equator it is.

The prime meridian is the main line of longitude that circles Earth. It is the starting point for measuring lines of longitude. Each line of longitude is marked with a number that says how many degrees east or west of the prime meridian it is. You can accurately identify absolute, or exact, locations on Earth. You determine the degrees that identify the latitude and longitude lines that cross closest to your location.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is the purpose of a compass rose?

_____

_____

2) What is a line of latitude? _____

_____

3) What is a line of longitude? _____

_____

4) In your own words, explain how to find an absolute location. _____

_____

_____

5) Which is more helpful on a map, a compass rose, or lines of latitude and longitude? Why?

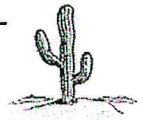
_____

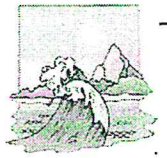
_____

_____

Ecosystems

Cross-Curricular Focus: Life Science





An **ecosystem** is all the things that interact in a specific area, whether they are living or non-living. Some examples of non-living things that support life in an ecosystem are light, air, soil and water. Living things are the plants and animals, called **organisms,** that use those resources.

Each of the specific ecosystems in the world has its own conditions created by the non-living things. These conditions determine what kinds of living things will be able to thrive there. Organisms can only thrive where their needs are being met. Everything in an organism's environment has an effect on it. One ecosystem that allows many different kinds of organisms to thrive is a temperate zone. It is an area where the conditions never become too hot or too cold.

All the living things in an ecosystem are called a **community**. All of one specific kind of organism living in a community is called a population. All the tree frogs in a rainforest community are one population within the community. All the white birch trees are another population within the same community. All the jaguars are yet another rainforest community population.

All living organisms perform certain life processes. They take in nutrients like air, sunlight, water, and food. They use energy from those nutrients to grow and develop. They release energy by doing work and moving. They release waste products. They react to things in their environment. They reproduce, producing offspring, or babies, that are similar to themselves.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is one example of a non-living thing in an ecosystem? _____

_____

2) What are three of the life processes that living organisms do? _____

_____

_____

3) What does population mean in a community?

_____

_____

4) When does an organism thrive?

_____

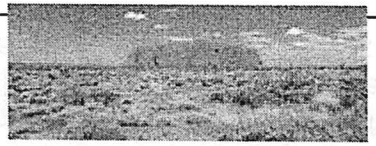
_____

5) Why does a temperate zone support many varieties of organisms? _____

_____

Chaparral Ecosystems

Cross-Curricular Focus: Life Science



The chaparral ecosystem is a plant and animal community that is relatively rare. It is characterized by shrubland and a specific weather patten. Winters in this ecosystem are mild and wet, and the summers tend to be hot and dry. The state of California in the United States has one of the world's largest chaparral ecosystems. They can also be found in parts of northern Mexico, Australia, Chile, and South Africa.

Wildfires occur frequently in this ecosystem. Lots of very flammable plant growth builds up in between fire seasons. Only about 15-39 inches of rain fall each year. Shrub plants of the chaparral are most likely to catch fire in the late summer or early fall. That's because the summers are extra dry. The thought of fire is frightening to people with homes or businesses. However, it is far more dangerous not to have wildfires. When there are no fires, the shrubs take over. Small fires once in a while are beneficial. They keep the plant growth under control. They also act in some other surprising ways. There are some plant species in chaparral ecosystems that cannot reproduce unless there has been a fire. The heat, smoke and changes in the soil that follow a burn actually release seeds from some plants.

What causes the frequent fires in this region? Sometimes lightning strikes will catch plants on fire. However, this accounts for only a small portion of the fires. Humans are the cause of many wildfires. A match, cigarette or campfire left carelessly unattended can cause a fire. Hot, dry winds, like the Santa Ana winds in California, make the fire go wild. If it has been a long time since the last fire, plants will fuel the fire. It is often very difficult for firefighters to put out these fires.

People who live in and near chaparral ecosystems have to clear plants from around their homes. This helps to prevent the home from being damaged in a fire.

Although there are hazards in this ecosystem, people can take steps to remain safe. Wildfires are a natural and important part of a healthy chaparral ecosystem.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) There are lots of disagreements between people who think we must prevent all wildfires, and people who think we need to let them happen. What do you think? Why?_____

_____

_____

2) What can people do to prevent accidental fires?

_____

_____

3) Give one statement from the passage that supports the idea that we should allow wildfires to burn.

_____

_____

4) When are the shrub plants most likely to catch fire?

_____

_____

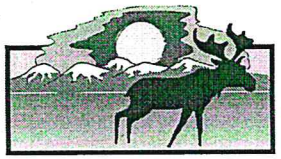
5) What is the main idea of this passage?

_____

_____

Taiga Ecosystems

Cross-Curricular Focus: Life Science



Taiga ecosystems cover large areas of North America. They are also found in Europe and Asia. A good example of a taiga ecosystem in the United States is the state of Alaska.

The weather is very cold in taiga ecosystems. The winter season lasts a long time. It gets icy cold. Storms are severe, bringing biting cold winds. Summers never get very warm and are extremely short. There isn't much precipitation in a taiga ecosystem. When moisture does fall, it usually comes in the form of dry, powdery snow.

Living in the extreme conditions of a taiga ecosystem takes a special kind of organism. Some common animals you could find in the area are moose, wolves and deer. Each animal **population** has to adapt to the severe conditions. Short, stubby grass and shrubs grow in taiga regions. Beautiful evergreen trees grow there, too. All the trees you think of when you imagine a Christmas tree are at home in the taiga. Pines, firs, and spruce trees are common. The thin, waxy leaves of evergreen trees are sometimes called needles. They hold in water all year round. They also do not freeze easily. In the taiga, temperatures drop down very low.

All green plants are an important source of oxygen for our planet. The many trees of the taiga region add oxygen to the air. Green plants go through the process of photosynthesis to make their food. They use the carbon dioxide that humans and other animals breathe out. At the end of the process, they release oxygen into the air. Since taiga ecosystems have so many trees, they help make up for areas with less plants, like the desert.

People living and working in taiga regions affect the natural balance. Activities such as hunting, trapping and fishing change the animal populations. Animals can be over-hunted and become endangered. Drilling for oil and gas destroys the soil. Harvesting trees damages animal habitats. It also robs the Earth of oxygen sources. Even tourism can cause problems. Some tourists do not respect wildlife and plants. They are willing to sacrifice the habitat for developed recreational areas. People have the right to use natural resources. They should, however, use them in a way that doesn't harm the ecosystem.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) Why do you think that taiga ecosystems are home to evergreen trees?

_____

_____

2) Give an example of an organism that lives in the taiga.

_____

_____

3) What do green plants release that humans breathe?

_____

_____

4) What is a human activity that might harm the taiga ecosystem?

_____

_____

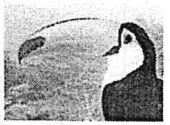
5) What is summer like in the taiga?

_____

_____

Rainforest Ecosystems

Cross-Curricular Focus; Life Sciences



Rainforest ecosystems are found near the equator, the center imaginary line of latitude that runs east and west around Earth. Tropical rainforests have more rain than other areas. The weather is warm and humid all year long. There is lots of sunlight.

Living things are **abundant** in the rainforests. There are thousands of species of animals and even more kinds of plants. Their needs for sun, water and warmth are all met by the conditions of the rainforest. The excellent conditions allow them to **thrive.** There is an amazing amount and variety of plants in that one location. This variety makes the rainforests a major source of Earth's overall oxygen supply.

Tropical rainforests have layers of life. The uppermost layer is called the **canopy.** Very mature, tall trees stretch out their branches and leaves, nearly blocking out the sun in some places. Many animals live high in this green, leafy habitat. You can find monkeys, tree frogs and many different species of birds.

Below the treetops is a second layer, called the understory. The understory is shaded by the canopy. Not as much sunlight reaches the plants in the understory. Bushes and growing trees make up the understory. It is home to birds, reptiles and small climbing animals.

The third layer, the forest floor, is busy with life. Vines, shrubs, mosses, ferns, flowers and large predator animals, such as jaguars, can be found there. Small animals burrow into the ground and live in bushes. Leaf-cutter ants and other insects busily hunt for food and water.

Rainforests contain some of Earth's greatest biological treasures. Many medicines are made from plants found there. Scientists have used them to make some promising drugs for treating cancer and AIDS. Food sources are very rich, too. There are over 3,000 fruits alone. Rainforests also grow the vegetables and grains that make up most of the world's daily diet. You can find corn, potatoes, rice and squash there. Spices like ginger, cinnamon, and chocolate grow alongside coffee and a variety of nuts. The rainforests produce all this in addition to providing oxygen for Earth. The rainforests are very valuable to the planet.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is the canopy of the rainforest?

_____

_____

2) Why might a scientist be interested in the rainforests? _____

_____

3) Do you think you could survive alone in a rainforest? Why, or why not?

_____

_____

4) Describe the conditions that make a rainforest a good place for many living things.

_____

_____

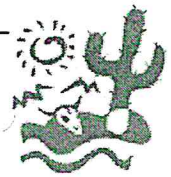
5) Rainforests are found near what imaginary line?

_____

_____

Natural Resources

Cross-Curricular Focus: History/Social Sciences



People often have decided where they wanted to live based on the **natural resources** that were available in the area. Natural resources are things that are useful to people and come from the earth. Materials for building shelter are natural resources. So are food sources such as fruits and vegetables, animals that could be caught or hunted and water.

A region's climate and landforms let certain things grow in different areas. They also determine which organisms will be able to survive there. Regions with very rich soil make good farming communities. Poor soil may send farmers looking for better conditions. However, areas with poor soil may attract those who have other purposes for the land. Poor soil doesn't matter if you want to build a factory or if the land has grass for ranching.

Each area attracts people based on their interests and purposes. Areas that support many different interests will naturally have larger populations. While you may not think of the mountains, lakes, or oceans as natural resources, they are. Villages and cities built near water sources have been the most successful. People who want to catch fish for a living can do that by the ocean, but cannot in the desert. People living near water can use it to meet their daily needs. Water can also be used to transport goods to other areas to be sold.

Places that are difficult to reach will naturally have fewer people living in them. Places that are high on mountain tops are not very desirable to some people. Neither are places that are In the middle of hot, dry deserts.

For too long, humans have destroyed resources. We have been using up those that cannot be easily replaced. Renewable resources are those that can be replaced easily. We are fortunate to have many resources that are renewable, such as sun, wind, water and trees. We need to focus more on using renewable resources. This will protect our planet from further harm.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) Think about the natural resources near you. What are the things that made your family decide to live where you do?

_____

_____

2) What is a renewable resource?

_____

_____

3) Give some examples of shelter.

_____

4) When you become an adult, will you choose to live the same place as your parents did? Why or why not?

_____

_____

5) What natural resources are available on the coast that might not be available somewhere else?

_____

_____

What's Eating You?

Cross-Curricular Focus: Life Science

All the living things in an ecosystem have a role to play. Plants are **producers**. Inside their green leaves they have round discs called chloroplasts. They are in stacks called grana. A green substance called chlorophyll fills the chloroplasts. It is what gives plants their green color. The chloroplasts allow plants to use water, sunlight and carbon dioxide to produce their own food. That's why they are called producers.

When an animal eats a plant, energy that the plant got from the sun is transferred to the animal. An animal that eats plants is called an herbivore. Since it is the first animal in the food chain, it is also the primary **consumer**. A consumer is an animal that eats plants or other animals. Consumers that eat only other animals are called carnivores. Consumers that eat both plants and animals are called omnivores.

Producers are critical to the survival of all living organisms in an ecosystem. Consumers depend on producers for the food which gives them energy. None of the other living things in the ecosystem would survive for long without producers.

Many plants make seeds by combining pollen from their flowers with pollen from other flowers. Water or wind occasionally help pollen get where it needs to go. Sometimes it is carried by animals, especially birds and insects.

Since some animals eat plants, it makes sense that animals sometimes help plants to reproduce, or make more plants. These animals that help plants reproduce by carrying pollen from one plant to another are called **pollinators**. Larger animals often help plants reproduce without even realizing it. Some seeds are caught in animal fur or eaten with fruit from the plants. The animal carries seeds from one place to another so plants can spread to new places. The seeds are deposited and grow in their new locations. Carrying and scattering plant seeds so they will have the opportunity to expand to new areas is called **seed dispersal**.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is the relationship between producers and consumers?

_____

_____

2) What is the ultimate source of energy for all living things?

_____

3) How do animals help ensure that plants reproduce?

_____

_____

4) Give an example of a pollinator.

_____

5) Describe a food chain with at least three links. What is the producer? What is the primary consumer? What is the secondary consumer?

_____

_____

_____

Hide and Seek

Cross-Curricular Focus: Life Science

In the wild, it often comes down to **predator** and **prey**. There is the hunter and there is the hunted. Organisms want to stay alive. They hide or escape from animals who would like to eat them. So how do they do it? They adapt to their environment.

One very helpful adaptation is called **camouflage**. You may have been surprised at some time by an animal that used camouflage. It blended into its surroundings so well that you nearly missed seeing it. Its coloring, markings or other physical features allowed it to blend in to the area around it.

Animals use camouflage to fool a predator. The hidden animal is not seen when a predator scans an area looking for food. Wild goats, for example, have coats that make them look invisible among rocks. A baby giraffe's coat helps it hide among the grass and trees. A chameleon is a lizard that will change colors depending on the surface it is on.

Camouflage often works the other way around, too. Predators can use camouflage to trap their prey. A predator can attack unexpectedly an animal it wants to eat. The prey animal doesn't see danger because the predator blends into the habitat. A leopard's spotted coat helps it blend in to the background and sneak up on its prey.

Another popular adaptation is **mimicry**. Mimicry is when an animal has the physical characteristics that makes it look like another animal or a plant. Some moths look like a wasp. Predators that don't like wasps will think the moth is a wasp and not eat it.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is the function of camouflage in the wild?

_____

_____

2) How do animals use mimicry to protect themselves?

_____

_____

3) What's the difference between camouflage and mimicry?

_____

_____

4) If you were a wild animal, would you rather have the ability to mimic another animal or the ability to camouflage yourself? Why?

_____

_____

5) If a chameleon was on a green leaf, what color do you think it would be?

_____