Chapter 13

Depending on Each Other

13-1 Living Together

**recycling**- reusing a substance over and over again

**habitat**- the place where an organism lives

**population**- all the members of a species living in the same place

**community**- a group of different populations living in the same place and interacting with each other

**ecosystem**- a community and all to nonliving things that the community interacts with

\* Take a breath of air. That same air might have been breathed by Christopher Columbus in 1492 or Cleopatra in ancient Egypt.

\* The air that our bodies use has been around for millions of years. We breathe it again and again.

\* In fact, all of the air, water, and food our bodies take in use been used before. This is called **recycling**.

\* Nature recycles its resources. A resource is anything that an organism can use to live.

\* We make our own resources that are not available. We make blankets. We make processed food, such as macaroni and cheese.

\* All organisms share resources on Earth. Many organisms depend on each other to meet basic needs, such as eating food.

\* **Habitats** can be small places or large places. For example, a bird’s habitat is the tree in which it builds its nest. You could also refer to the entire forest where the bird lives as its habitat.

*Make a poster of your habitat using paper provided by your teacher.*

\* All of the members of a species living in the same place make up a **population**. For example, all the bullfrogs in a pond are a population. All the pine trees in a forest are a population. All the people in the city are a population.

\* One place can be the home of many populations. For example, a forest has mice, foxes, deer, plants, weeds, insects, trees, berries, and all sorts of other life.

\* These populations make up a **community**. All of the plants and animals living in a desert make up the desert community. All the organisms living in a mud puddle make up the mud puddle community.

\* Organisms in a community interact with each other. How do we interact with each other in this class? This hallway? This school? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\* There are many different **ecosystems** in the world. They all have a common purpose, however. All livings things are trying to survive. Even animals that travel or hunt alone rely on other features of the ecosystem for survival (some living and some not). For examples, animals breathe in oxygen from the air. Plants take in water from the soil through their roots.

\* The kinds of organisms that are found in a given environment are adapted to use the nonliving resources that are available to them. For example, the scarcity of water in a desert requires that the organisms living there are able to conserve water.

\* Ecosystems need all of the parts working together. For example, if the bugs in an ecosystem leave or die, then spiders would die. Anything that eats spiders would not have a food source. When those creatures die (or leave) the things that feed off of those creatures die (or leave).

\* A counter example of this is what happens to the deer population if all of the predators are gone. The population would grow too large and the deer would eventually starve (begin dying off).

\* That is why balance is crucial to keep the organisms alive.

\* Even trees are important, even if they provide no food or housing for an animal. The tree may provide camouflage or cover from predators. The tree might also block heat to keep the temperature lower.

\* Some communities, such as an oak-hickory forest, change very little over time. These stable communities are called climax communities.

\* It may take hundreds, or even thousands of years, but a pond can turn into a forest.

*13-2 Using Nature’s Resources*

**food chain**- the path of food through a community

**producer**- an organism that makes its own food

**consumer**- an organism that eats other organisms

**food web-** a group of food chains that are linked to each other

**decomposer**- an organism that breaks down and absorbs nutrients from dead matter

**fossil fuel**- a fuel made of organisms that died millions of years ago

**solar energy**- energy from the sun

**evaporation**- the process by which a liquid changes to a gas

**condensation**- the process by which a gas changes to a liquid

**natural resource**- a substance found in nature that is useful to humans

**conservation**- the wise and careful use of natural resources

\* All of the organisms in a community need food. Plants make their own food. Some of the animals eat the plants. Other animals eat the animals that feed on the plants. This is all part of a food chain. A community may have many different food chains. Some of the food chains overlap.

\* Every food chain begins with a **producer**. Green plants and other organisms have **chlorophyll**. This is the green coloring matter of leaves and plants, essential to the production of [carbohydrates](http://dictionary.reference.com/browse/carbohydrates) by [photosynthesis](http://dictionary.reference.com/browse/photosynthesis), and occurring in a bluish-black form.

\* Many producers are eaten by **consumers**. Animals, fungi, most bacteria, and some protists are consumers.

\* Most consumers eat several kinds of food. They are part of more than one food chain. So the different food chains in a community are usually linked to each other to form a **food web**.

\* Some consumers, such as certain bacteria and fungi, are **decomposers**.

\* Decomposers break down large molecules in dead organisms into smaller ones. Some of these molecules become food for the decomposer. Others become part of the soil.

\* Plants use these molecules to live and grow.

Many algae are able to absorb minerals directly from the rocks on which they are attached.

\* The continuous movement of food through a community forms a *food cycle*.

\* Where does the gasoline that is used for cars come from? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\* This is because gasoline is a **fossil fuel**.

\* Fossils are the remains of organisms that lived a long time ago.

\* Deep in the Earth, heat and pressure slowly changed the remains of dead organisms into coal, oil, and natural gas. The United States has a healthy supply of natural gas at this time.

\* People discovered that they could burn these materials for energy.

\* The Earth has a limited amount of fossil fuels. Even though they are made from dead, decaying matter, it takes a long time for the materials to turn into fossil fuel. We use them at a rate far faster than they are naturally made.

\* We are constantly looking for other sources of energy. For example, scientists are looking for ways to harvest the energy from the sun. Solar energy is used to heat homes and light museums and other buildings.

\* There is only a certain amount of water on Earth. In fact, that amount has remained relatively constant since the start of time. People and other organisms use that water over and over again.

\* Water is continuously moving from different parts of the Earth. Rainwater falls to the ground. Water in the ground runs into streams. Streams run into rivers. Rivers run into lakes and oceans.

\* About 300 billion grams of water evaporate from the Earth’s oceans each year.

\* Water travels underground through aquifers. An aquifer is

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| a body of permeable rock that can contain or transmit groundwater.  \* When water heats up, it changes into a gas called water vapor. The sun’s  energy causes the water to evaporate from the land and bodies of water.  \* Plants and other organisms release water vapor into the air.  \* When do you see water evaporate into the air? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \* When water vapor cools, it is turned into a liquid. When have you seen this?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \* The water returns to Earth as Rain or snow.  \* The continuous movement of water on Earth is called the *water cycle*.  \* Just like water cycles across the Earth in various forms, oxygen and carbon dioxide do, too.  \* The recycling of air involves two processes that you already know about- photosynthesis and respiration  \* When green plants carry out photosynthesis, they give off oxygen as a byproduct. People and other organisms use this oxygen for respiration.  \* Remember that carbon dioxide is a waste product of respiration. Carbon dioxide is a gas that plants need for photosynthesis.  \* This is just another example of organisms needing each other.  \* Since our resources are scarce and limited, it is important to conserve them.  \* **Natural resources** such as water, air, soil, minerals, forests, wildlife, and fossil fuels are all helpful to humans.  \* Air and water are needed for health. Some things in nature, such as mountains and waterfalls, are called natural resources simply because they are pleasing to the senses.  \* Our Earth has more people than ever before. According to Google, there were **6,973,738,433** people on Earth in 2011. The United States had **313,914,04** people at that time.  \* This means that more trees, more oil and other fuels are consumed at record rates. Many plant and animal species have been killed off (extinct).  \* The loss of any type of organism can harm other populations in that organism’s habitat.  \* **Conservation** is the wise and careful use of natural resources. More and more people are realizing just how delicate the Earth’s ecosystems are. We must save the Earth’s natural resources for our future generations. Let’s read more about conservation and what you can do to help. |