Activity 7

Think Like a Scientist

Plant Scientist

In this investigation, you will carry out the work of plant scientists, called botanists. You have just learned about how the roots, trunks, and leaves of two trees have adapted to extremely different environments. Consider what you know about how each part of a plant plays a role in getting the plant what it needs to survive.

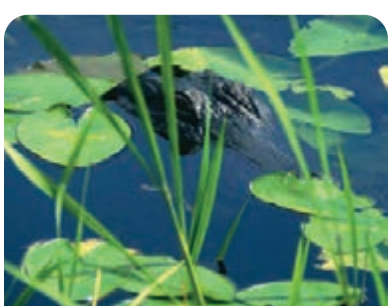
What Will You Do?

Examine the photos for clues that might tell a story about the conditions and environment where these plants live. Which adaptations do you think are critical to their survival? **Record** your answers in the table.

Palm Tree in a Desert

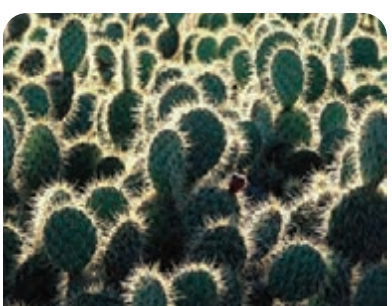
Pine Trees in the Snow

Mangrove Trees in Saltwater



Water Lilies in a Wetland

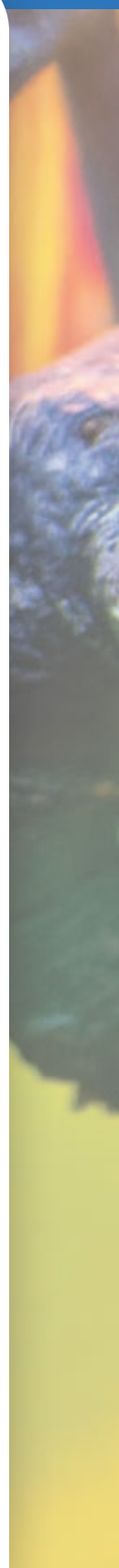
Acacia Trees in the Savannah



Barbary Fig in a Desert

Life Skills I can analyze a situation.

Type of Plant	Structural adaptations I notice are . . .	I think this helps the plant to survive because . . .
Palm Tree	Thick trunk and narrow leaves	
Pine Tree	Triangle shape, needles instead of leaves	
Mangrove Tree		
Water Lily		
Acacia Tree		
Barbary Fig		



How Are Body Systems Adapted to Meet the Needs of a Living organisms?

Activity 8

Observe Like a Scientist

Digestive System

All organisms show individual adaptations, but how do these adaptations work together? Parts of an animal's body that work together to perform a job are called systems. A system is made up of organs that work together to keep an **organism** alive.

How are other body systems adapted to meet specific needs? Let's investigate two examples: the **digestive system** and the **respiratory system**. You might not always think about how you breathe or process food for energy. You might think that all animals eat and breathe in the same way as humans. It is important to understand the difference between body systems in animals and humans.

Read the text that follows and **complete** the interactive to learn about the digestive system. Then, **answer** the questions.

Human Digestive System

Have you ever wondered what your body does with all the food you eat? Or why we need to eat food at all?

Your body gets nutrients from food. It gets **energy** from some of these nutrients. You need energy to walk, talk, or sleep. You also need energy for your body to function on the inside. You need energy for your heart to beat, your lungs to breathe, and your brain to think.

Your body uses the digestive system to get nutrients from food. The digestive system is made up of different **organs**. The organs work together to break down food into smaller parts that your body can use.

Human Digestive System, *continued*

Digestion begins in your mouth. When you take a bite of food, saliva moistens it and begins to break it down. Your teeth and tongue work together to mix and crush the food until it is soft and mushy.
When you swallow, your throat pushes the food into a tube called the esophagus. This tube has muscles that move the food down into your stomach.

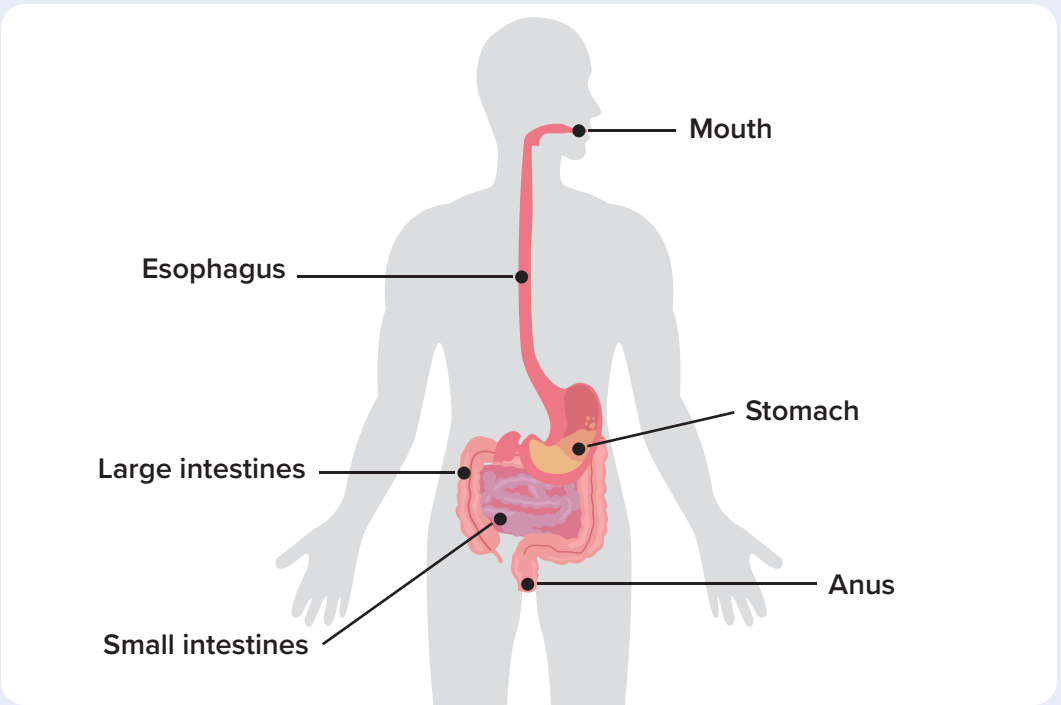


Photo Credit: Miriam82 / Shutterstock.com

Your stomach mixes the food with acid, digestive juices, and enzymes. Food usually stays here for a few hours until it is a soupy liquid. Next, the muscles of the stomach move the food into a long, winding tube. This tube is called the small intestine. If you stretched out the small intestine, it would be more than six meters long. Food gets broken down into small nutrients here. Juices from your liver and pancreas flow into the small intestines. They help break down the food into nutrients.

These nutrients from the food are absorbed through the walls of the small intestine. They enter into tiny blood vessels. Your blood carries the nutrients to all the parts of your body.

The body cannot use some parts of the food it consumes. These parts flow into the large intestine. The large intestine absorbs water from the undigested materials that now become solid waste. Solid waste leaves the body through the anus.

In one day, you need a lot of energy. Your heart beats around 100,000 times, you take over 20,000 breaths, and thousands of steps. It is a good thing your digestive system helps your body get the nutrients and energy it needs.

Why is digestion important?

Explain how the mouth helps digest food.

Compare and contrast the digestion that takes place in the stomach, small intestine, and large intestine.

Talk Together Think about preservation methods digestive health, and determine prevention methods

Activity 9

Observe Like a Scientist

Respiratory System

Have you ever felt out of breath after running for a minute or two? Or noticed that sometimes your breath quickens when you need more air? Like getting nutrients from food, getting oxygen from the air is a complex process that depends on many organs working together. The respiratory system is tasked with bringing air into the body, taking out the parts we don't need, and pushing out the waste products. This process of pulling air in and pushing it out of our bodies and gas exchange is called respiration.

Still not completely sure how respiration happens? **Read** the passage that follows to learn how this system works.

Photo Credit: Miriam82 / Shutterstock.com

How does the respiratory system work?

Our bodies need oxygen in order to function. We get oxygen from the air in our atmosphere. While it might be invisible, it is around us all the time and very important to our bodies. We cannot store extra oxygen in our body, so we must constantly take in new oxygen.

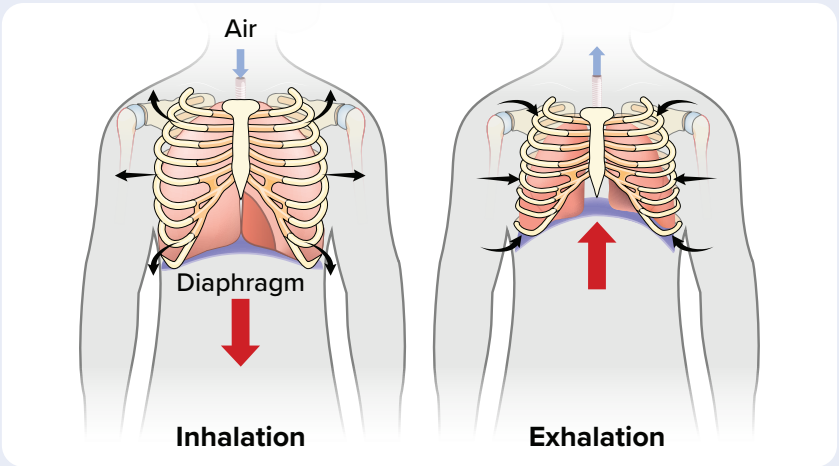
Take a deep breath. When you breathe in or inhale, air rushes in through your nose and mouth and down your throat. From there, the air travels down your trachea into your lungs. Your lungs fill up like two balloons. Now what?

Inside the lungs, two bronchi are divided into smaller and smaller bronchioles that look like the branches of a tree. At the ends of these tubes are the alveoli, which are little sacs surrounded by blood vessels. It is here that oxygen moves into your blood stream.

The process of using oxygen from the air also creates a waste product, carbon dioxide.

How does the respiratory system work?, *continued*

This gas is harmful to our bodies if it builds up. When you breathe out or exhale, your body expels the carbon dioxide back into the air through your mouth and nose.



The motion of inhaling and exhaling is directed by a large muscle at the base of your ribs, the diaphragm. As you inhale, the diaphragm shrinks, or contracts, and moves downward. This lets your lungs expand and fill up. As you exhale, the diaphragm expands and moves up, pushing air out of your lungs.

All of these processes and activities happen inside your body without you having to think about it.

Explain how the diaphragm helps us breathe in and out.

Compare the air you breathe in with the air you breathe out.

How does the respiratory system get oxygen to the body cells?