

HEALTH AND THE PHYSICAL BODY

3-8 Science Unit Study



THE GOOD AND THE BEAUTIFUL

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A top-down view of various healthy foods including fruits, vegetables, nuts, and seeds arranged on a wooden surface. The foods include: halved grapefruit, green grapes, sliced cantaloupe, dark red cherries, a whole red apple, sliced kiwi, raspberries, blueberries, almonds, walnuts, cashews, sunflower seeds, pumpkin seeds, flax seeds, goji berries, avocado halves, spinach leaves, and cherry tomatoes. The background is a dark red with a faint molecular structure pattern.

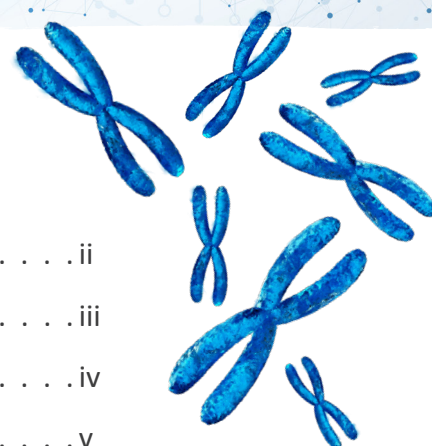
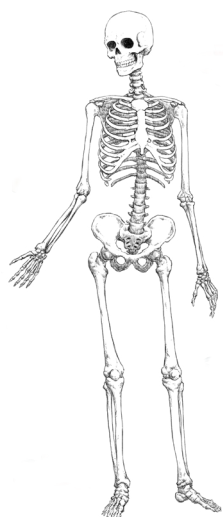
 THE GOOD AND THE BEAUTIFUL

Health & the Physical Body

CREATED BY THE GOOD AND THE BEAUTIFUL TEAM

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Unit Information

Science Journal



All The Good and the Beautiful science units include activities in a student journal. Each student should have his or her own student journal, and the parent or teacher will direct the student regarding when to complete the activities as directed in the lessons. Student journals can be purchased by going to goodandbeautiful.com/science and clicking on the *Health and the Physical Body* unit link.

Science Wall



All The Good and the Beautiful science units include vocabulary words to be placed on your science wall, which is a wall or tri-fold presentation board in your learning area on which you can attach the vocabulary words and other images. **Cut out the vocabulary word cards at the beginning of the unit.** The course will indicate when to place them on the wall.

Lesson Preparation

All The Good and the Beautiful science units include easy-to-follow lesson preparation directions at the beginning of each lesson.

Activities



Many of The Good and the Beautiful science lessons involve hands-on activities. **Adult supervision is recommended for all activities and experiments as some require sharp objects, heat sources, or small objects that could be a choking hazard for young children.**

Unit Videos



Some lessons include videos that were created by The Good and the Beautiful. Have a device available that is capable of playing the videos from goodandbeautiful.com/sciencevideos or from the Good and Beautiful Homeschool app.

Content for Older Children



Some lessons include extra content that is more applicable for older children (grades 7–8). Parents or teachers may choose to skip this content if instructing only younger children.

Content for Younger Children



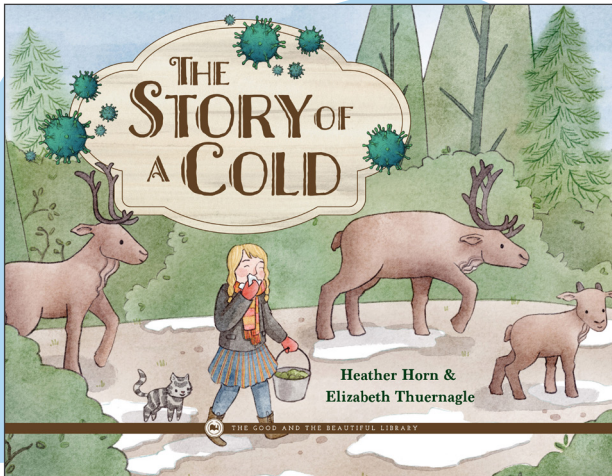
Some lessons include extra content that is more applicable for younger children (grades 3–6). Parents or teachers may choose to skip this content if instructing only older children.

Versions

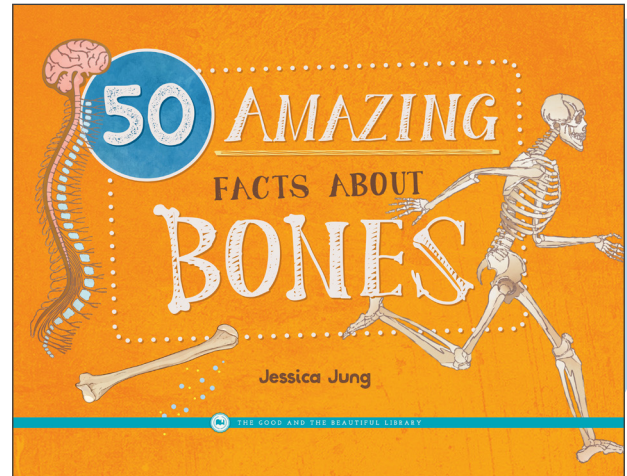
New discoveries are being made on an ongoing basis. This course is reviewed and revised periodically to keep information as up-to-date as possible. This version is the first edition of this unit.

Read-Aloud Book Pack

The books below are optional read-aloud books that complement this unit. These books can be purchased as a book pack by going to goodandbeautiful.com/science and clicking on the *Health and the Physical Body* link.



The Story of a Cold
by Heather Horn and Elizabeth Thuernagle



50 Amazing Facts About Bones
by Jessica Jung

CORRELATED BOOKS

The Good and the Beautiful Bookshop has several books that correlate well with the *Health and the Physical Body* unit. It can be a wonderful experience for children to read books on their level related to the subjects they are learning in science. The bookshop includes both fiction and nonfiction books organized according to reading level. Find these correlated books by going to goodandbeautiful.com/science and clicking on the *Health and the Physical Body* science unit product page.

Lesson Extensions

How the Extensions Work

Each lesson has an optional lesson extension for children in grades 7-8. Complete the lesson with all the children, and then have the older children complete the self-directed lesson extension. These extensions are located in the *Grades 7-8 Health and the Physical Body Student Journal*.

Answer Key

The answer key for the lesson extensions can be found on the free Good and Beautiful Homeschool app in the science section. Visit goodandbeautiful.com/apps for information on accessing the app. The app can be accessed from a computer, phone, or tablet.

Flexibility

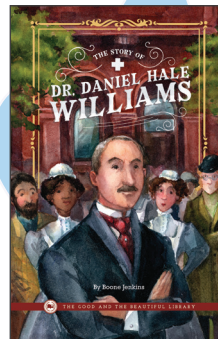
The amount of time it will take to complete each lesson extension will vary for each child. The average time is about 10-15 minutes per extension. Parents/teachers and children may choose to omit parts of the lesson extension if desired. Encourage the children to stretch their capabilities, but also reduce work if needed.

Taking Notes

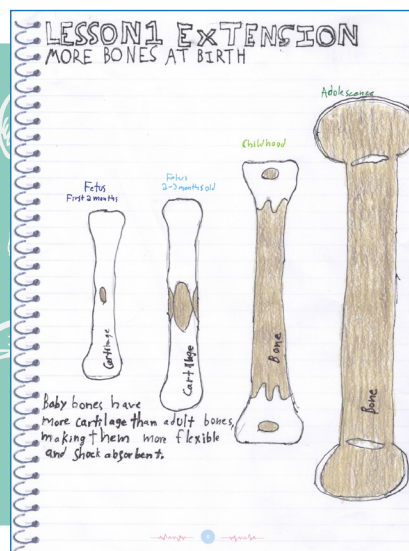
Some of the grades 7-8 lesson extensions have the children summarize the material read. Teach the children to look for key information and then to summarize the most important points. Students can also add notes with their thoughts and the facts that are most interesting to them.

Optional Grades 7-8 Reading Book

We recommend *The Story of Daniel Hale Williams* by Boone Jenkins as extra reading for students in grades 7-8. This book can be purchased by going to goodandbeautiful.com/science and clicking on the *Health and the Physical Body* unit link.



The Story of Daniel Hale Williams
by Boone Jenkins



Supplies Needed



You will need the following supplies for **activities**. There are no experiments in this unit.

Lesson 1

- 1-cup measuring cup
- Sand (optional)
- Scissors

Lesson 2

- Small mirror or access to larger mirror
- Apple or other piece of fruit, such as a banana or peach, per child
- Glue stick
- Colored pencils or crayons
- Scissors

Lesson 3

- Saltine cracker for each child
- 1 piece of sandwich bread
- Quart-sized zipper bag
- $\frac{1}{4}$ cup vinegar, any kind
- Clear drinking glass or bowl
- 2 Tbsp cooking oil, any kind
- 1 Tbsp green dishwashing liquid soap
- Spoon or something to stir with

Lesson 4

- Glue stick

Lesson 5

- Paper clip
- Pencil, pen, or colored pencils (optional) for each child
- Two bowls of the same size
- Two or three packages of children's favorite snacks that include nutrition labels
- Kitchen measuring utensils

Lesson 6

- 2 clear glasses or jars
- Water
- 2–3 drops of red food coloring
- 1 Tbsp of sand or small pebbles
- 1 coffee filter
- 1 rubber band

Lesson 7

- Empty toilet paper roll

Lesson 8

- Pint-sized jar with lid
- $\frac{1}{4}$ -cup, $\frac{1}{2}$ -cup, and 1-tablespoon measuring utensils
- Light corn syrup
- Red Hots® cinnamon candies
- Uncooked white beans
- Uncooked split peas

Lesson 9

- 2 bendy straws
- Electrical tape
- Scissors
- Rubber bands
- 3 large, uninflated balloons
- 64-ounce plastic fruit juice bottle
- Clay or play dough
- Glue stick

Lesson 10

- Pen or pencil

Supplies Needed

o o o

You will need the following supplies for **activities**. There are no experiments in this unit.

Lesson 11

- Crayons or colored pencils
- 2–3 plastic straws per child
- String or yarn
- Tape or 5 paper clips per child
- Scissors

Lesson 12

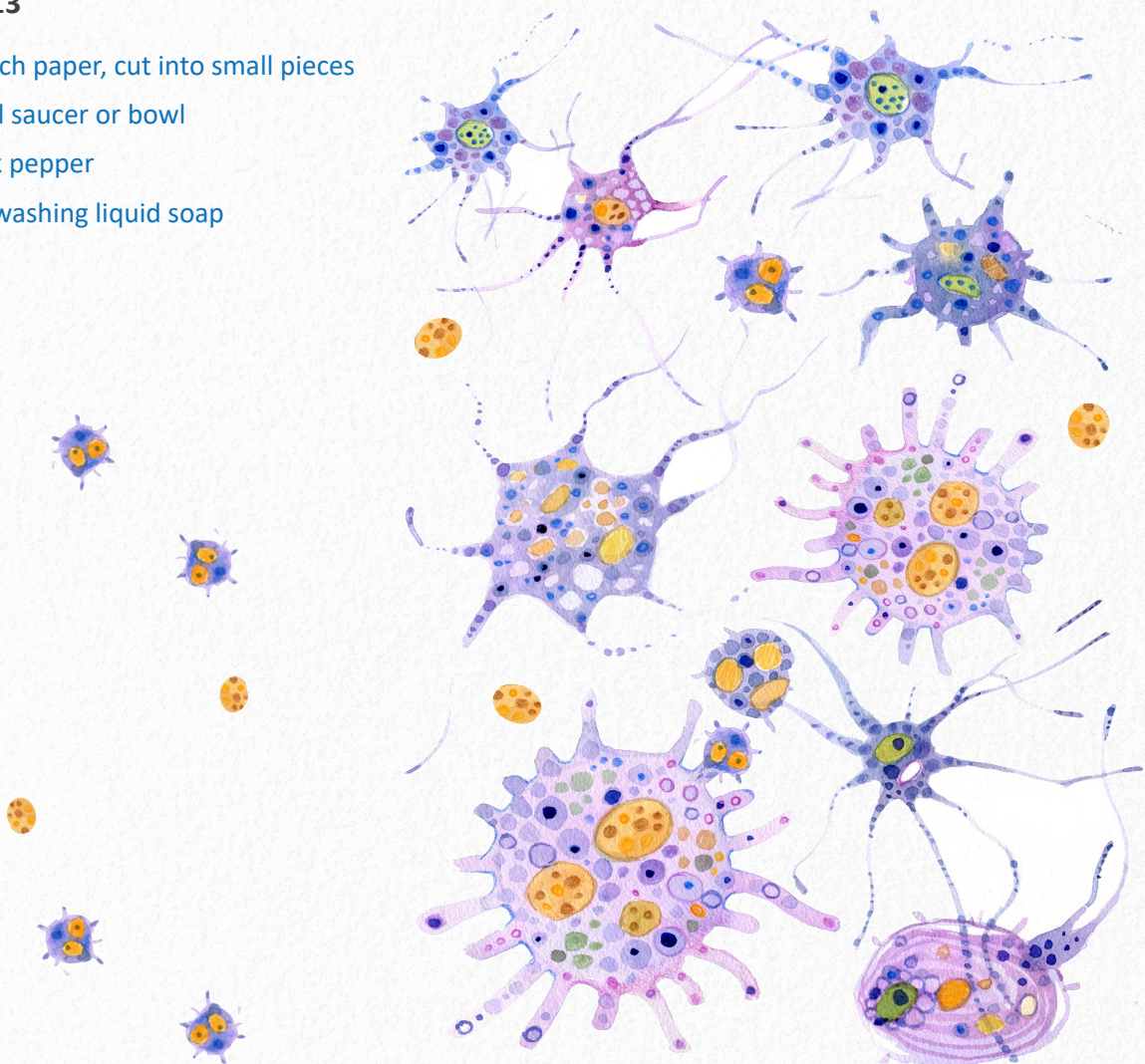
- Crayons or colored pencils

Lesson 13

- Scratch paper, cut into small pieces
- Small saucer or bowl
- Black pepper
- Dishwashing liquid soap

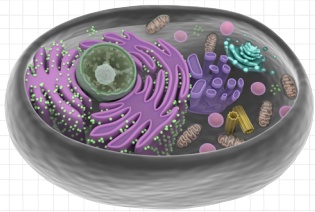
Lesson 14

- 1 red pipe cleaner per child
- 1 blue pipe cleaner per child
- 1 white pipe cleaner per child
- Pony beads, 4 different colors per child
- A pencil
- Transparent tape
- Scratch paper
- Mirror



Vocabulary

Instructions: Cut out the vocabulary cards in this section. Place them on your science wall when prompted to do so in the lessons. Review the vocabulary words several times during this unit and, if desired, at various times throughout the school year.



Cells

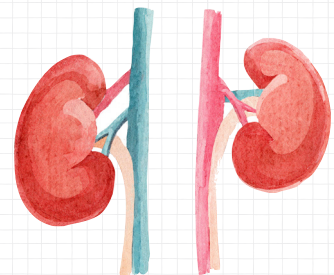
the smallest functional units of an organism

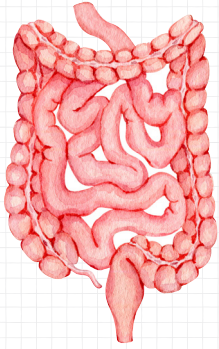
Tissues

groups of cells that are the same and work together to do a job in the body

Organs

self-contained groups of tissues that perform a specific job in the body





Digestion

the breakdown of food into substances that can be used by the body

Esophagus

a muscular tube in the throat through which food travels from the mouth to the stomach

Gastric Acid

a digestive liquid formed within the lining of the stomach that aids in digestion

Bile

a greenish-brown liquid secreted by the liver that breaks down fat in foods



Food Group

a group of various foods that contain the same key nutrients



Vitamins



organic compounds that are necessary for growth and nutrition and are needed in small quantities in the diet because they cannot be made by the body

Minerals

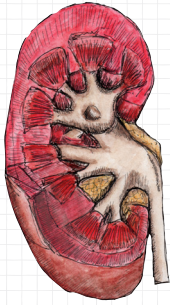
inorganic materials that cannot be produced by the body but are essential for healthy development



Urine

liquid waste that is produced in the kidneys





Nephrons

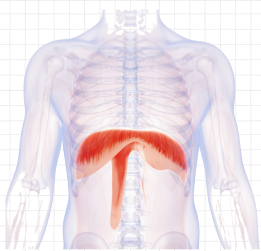
tiny filters in the kidneys that trap and remove waste from the blood

Blood Vessels

Very tiny tubes that form a network throughout the body to exchange oxygen, nutrients, and waste between blood and tissues. Three types of blood vessels are arteries, veins, and capillaries.



Diaphragm



the thin muscle that separates the chest and abdominal cavities and is the principal muscle of respiration

How the Body Is Formed

Objective

Help the children learn about the structure and function of cells and how the human body is formed.



Preparation:

- ☐ Cut out the “Parts of a Cell” cards.

Activity Supplies:

- 1-cup measuring cup
- Sand (optional)
- Scissors

Travel Through a Cell Activity



Read to the children: The human body comes in all different shapes and sizes. We have different colors of hair and eyes, different heights, and different skin tones. But underneath all these differences, we have exactly the same basic makeup. We are all made of **cells**.

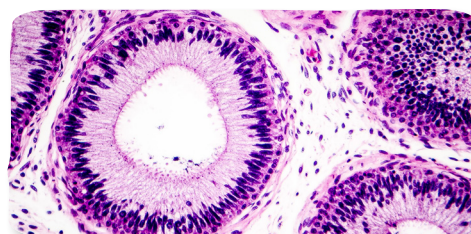


Have you ever put a puzzle together to create a beautiful picture? Cells are much like puzzle pieces. They are extremely small units that form the organs and tissues of the human body.

Let's do an activity to learn more about a cell.

1. Place the “Travel Through a Cell” activity page in front of the children.
2. Shuffle the “Parts of a Cell” cards.
3. Place the “Parts of a Cell” cards facedown along the top of the “Travel Through a Cell” page.
4. Have each child take turns flipping over a card and reading what is on the card. Have that child point to the part of the cell that the card refers to on the “Travel Through a Cell” page.

Optional: When all cards have been read, flip the cards back over. Take turns drawing a card and reading only the description of the cell part without showing the picture. Have the other children guess which part the description refers to by pointing to that part on the “Travel Through a Cell” page.



Cell Division and Development of a Baby



Have the children turn to the “Cell Division and Development of a Baby Cards” in Lesson 1 of their student journals and cut out the cards.

Read to the children: You have trillions of cells in your body. A trillion is a huge number that is hard to imagine. **Show the children the 1-cup measuring cup.** If we filled this cup with sand, it would hold about 8 million grains of sand. **Fill the cup with sand (optional).** It would take 125,000 cups to get 1 trillion grains of sand!

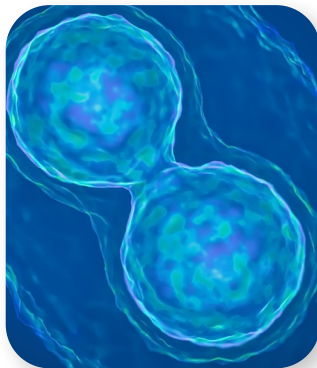


Have the children turn to the “Cell Division and Development of a Baby” page in Lesson 1 of their student journals. When you come to a bold blue word, have the children glue the corresponding card onto the page.

Read to the children: Follow along on your student journal page as I read, and then find the matching “Cell Division and Development of a Baby Cards” card to glue into place.

A baby begins life as a single cell called a **zygote**. This cell has all the genetic information from the mother and the father that join together inside the mother’s womb, where the baby begins growing.

All cells grow and multiply through division. What happens when you divide a cookie in half? [You get two pieces of a cookie.] What if we divide those two pieces in half again? We get four pieces! Cell division works *almost* the same way.



The single zygote cell divides, creating two cells. Those two cells divide, creating four cells. Then the four cells divide, creating eight cells, and so on. Unlike the cookie, which gets smaller when we divide it, when cells of a zygote divide, there are more and more cells of almost the same size—so it grows!

As the zygote cell divides over and over, different **types of cells** with different shapes, sizes, and functions begin to form. We have about 200 different kinds of cells, and each kind has a specific job.

Some of these cells become **tissues**, but not the kind of tissue you sneeze into! **Tissues** in your body are groups of cells that are the same and work together to do a job in the body. Your entire body is covered with a kind of tissue. Do you know what it’s called? Skin tissue! Your skin is really millions of flat skin cells that have all come together to form the skin tissue. We also have muscle tissue, nerve tissue, and even blood tissue.



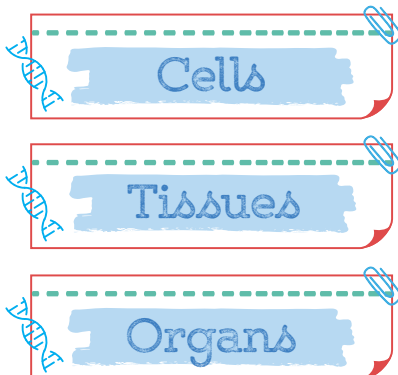
As the baby continues to grow, an **embryo** is formed. It is at this stage that the tiny heart forms and begins to beat, pumping blood through all the developing parts and organs of the baby’s body.

The cells continue dividing, tissues continue growing, and **organs**, self-contained groups of tissues that perform a specific job in the body, begin to take shape. Liver cells come together to form the tissues of the liver, intestinal cells come together to form the tissues of the intestines, nerve cells form the nerve tissue, and muscle cells form muscle tissue.

As the embryo continues to grow, the organs begin working together in systems. The systems continue developing into full maturity until the baby goes from being an embryo to a **fetus**. Then, at just the right time, the **baby** is born!

 Science Wall: Vocabulary Words

Place the vocabulary cards **CELLS**, **TISSUES**, and **ORGANS** on your science wall. Read and discuss the words and definitions.

 **Our Organ Systems Video**

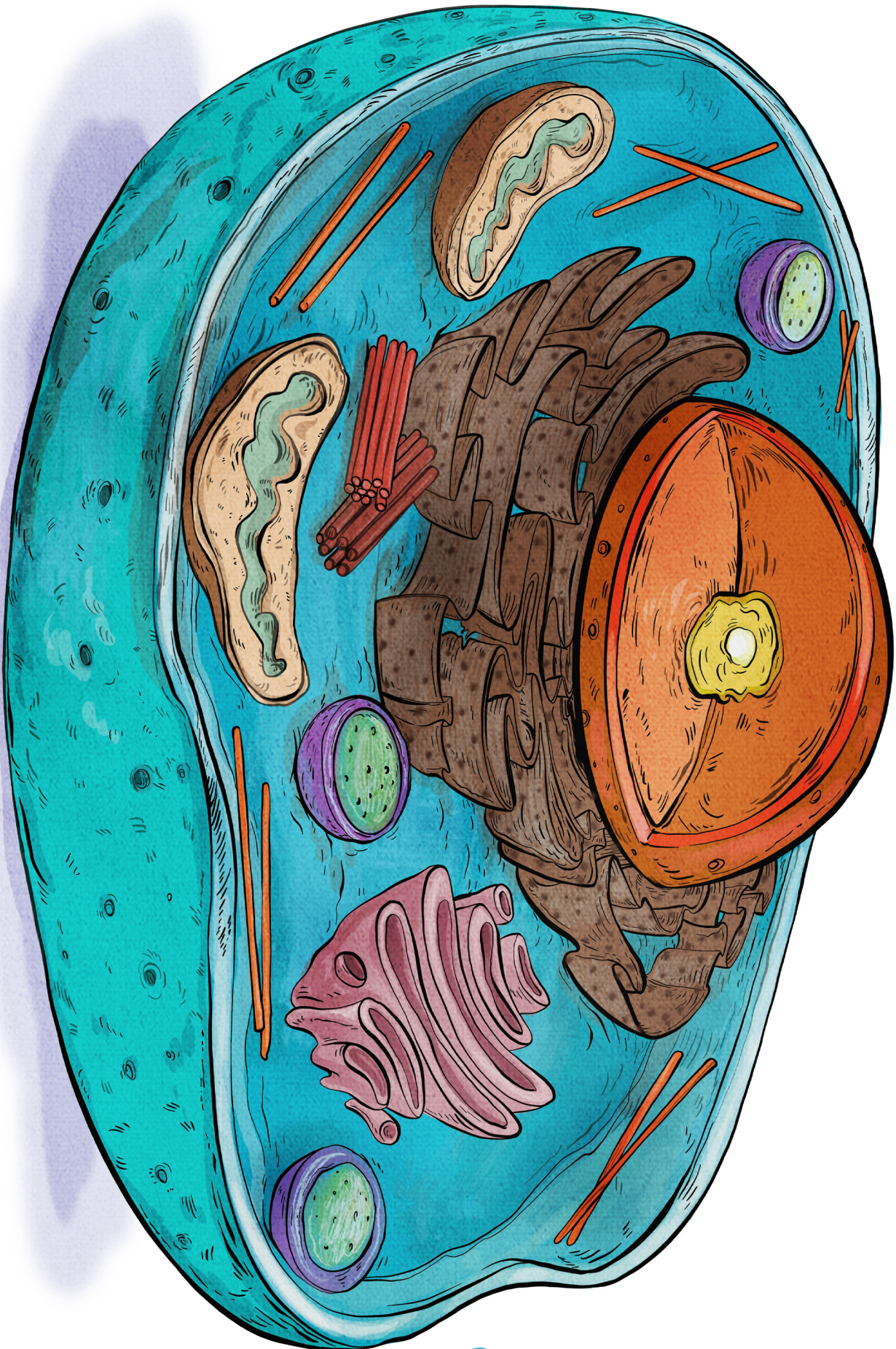
Read to the children: Let's learn more about the amazing organ systems in our bodies. **Watch the "Our Organ Systems" video** at goodandbeautiful.com/sciencevideos or on the Good and Beautiful Homeschool app.

 Lesson 1 Extension

Have children grades 7–8 complete the self-directed Lesson 1 extension titled "More Bones at Birth" in their student journals.



Travel Through a Cell



The Digestive System: Part 1

Objective

Help the children understand the features and functions of the tongue and teeth and their roles in digestion.



Preparation:

- Have a craft knife on hand to cut the flaps on the “Digestive System Lift-a-Flap” page.

Activity Supplies:

- Small mirror or access to larger mirror
- Glue stick
- Apple or other piece of fruit, such as a banana or peach, per child
- Colored pencils or crayons
- Scissors

Digestive System Lift-a-Flap



Read to the children: The digestive system is a group of organs that work together to break down foods you eat and drink into particles small enough to be used by your body.

Using the craft knife, cut along the dotted lines, NOT the solid, red lines, on the “Digestive System Lift-a-Flap” page. Place the sheet with the cut flaps on top of the sheet listing the organs and functions. Have the children lift one flap at a time and read about that organ.

Science Wall: Vocabulary Word



Place the vocabulary card **DIGESTION** on your science wall. Read and discuss the word and definition.



What's in There?



Give each child a small mirror or gather around a larger one. Read to the children: ***Digestion***, or the breakdown of food into substances that can be used by the body, begins in the mouth with the tongue and teeth.

Let's take a closer look! Open your mouth wide and look in the mirror. Now stick out your tongue and say, “Ah!” The tongue is a very important part of the digestive system. It helps us to chew our food by pushing it to our teeth and around in our mouths before we swallow.

Now smile really big into the mirror and examine your teeth. Are all of your teeth the same? How are they different? Why do you think they're different?

Our teeth all have different jobs to do when we eat, and the different shapes help with those jobs.



■ Break It Down Activity



Have the children turn to the “Break It Down” page in Lesson 2 of their student journals and complete it as you read through this section. The answer key can be found at the end of this lesson.

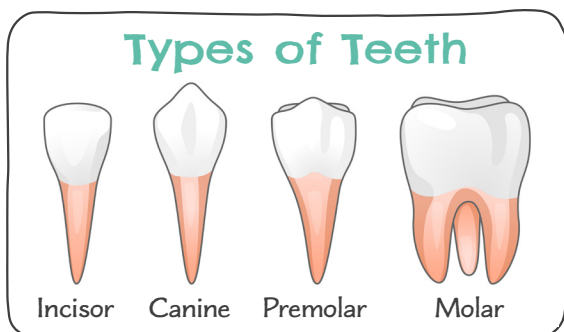


Give each child an apple or another piece of fruit, such as a banana or peach. Have the children take a bite from the fruit, paying close attention to which teeth are used.



Read to the children: Which teeth did you use to bite the fruit? The four front teeth on the top and bottom are used for biting and are called *incisors*. Color the incisors on your journal page blue.

Have the children take another bite of the fruit and chew, paying close attention to which teeth are used.



Read to the children: Which teeth did you use to chew? After you bit into the fruit and began chewing, the food moved from the incisors to the four pointy *canine* teeth on the top and bottom and to the eight *premolars* past the canines. There it is cut and torn into smaller pieces. Color the canine and premolar teeth green on your journal page.

The food then moves to the flat *molars* (which are the 12 teeth toward the back of your mouth) where it is ground into even smaller pieces. Color the molars on your journal page red. **Have younger children draw lines to match the teeth to their jobs on their journal page. Have older children fill in the blanks for which type of tooth matches the job description on their journal page.**

Have the children take another bite of the fruit and chew, paying close attention to what happens to the fruit while chewing.

Did the fruit change as you chewed it? How did it change? While you chew, your saliva is mixed with the apple as the teeth break it down into very small pieces. **Have older children fill in question #1 on the journal page. Have the younger children put the chewing sentences in order.**

Have the children take another bite and chew, paying close attention to what the tongue does.

What did your tongue do as you chewed? [moved the food around] What did it do once the food was broken down? [pushed the chewed-up food to the throat] **Have older children fill in questions #2 and #3 on the journal page.**



■ Parts of a Tooth Layered Book



Have the children cut out the “Parts of a Tooth Layered Book” pieces from Lesson 2 of their student journals, keeping the colored tabs attached.

Read to the children: The part of each tooth that you can see is only one part of the whole tooth. As we read about the different parts of a tooth, we are going to build a layer book in your student journals.

The part of the tooth found below the gumline is called the *root*. It holds your tooth in place and keeps it from falling out. **Have the children paste Layer 1 into the “Parts of a Tooth” box on the student journal page. Since this is the bottom layer, they will glue down the entire piece.**

Dentin is softer than enamel and contains small tubes, called tubules, that bring nutrients, immune cells, and other things the dentin needs from the body, through the pulp, and to the dentin. **Have the children place Layer 2 on top of Layer 1 and glue down only the tab on the top left.**

Pulp, the living tissue of teeth, is at the center of each tooth and holds the nerves and blood vessels. **Have the children place Layer 3 on top of Layer 2 and glue down only the tab on the bottom left.**

Our teeth are covered by the hardest material found in the human body—*enamel*. It provides a tough outer layer to protect the very delicate inner parts. **Have the children place Layer 4 on top of Layer 3 and glue down only the tab on the left side.**

The part of the tooth you can see is called the *crown*. **Have the children place Layer 5 on top of Layer 4 and glue down only the tab on the right side.**

Once dry, have the children fold back each layer along the edge of the glued-down tabs.

How Cavities Form

Read to the children: Although enamel is very strong, it is not indestructible. Tiny microscopic bacteria in our mouths eat sugar and excrete lactic acid. The acid doesn't affect the bacteria, but it can be very destructive to our teeth!

The acids bond to the enamel on our teeth, creating an abnormal patch of tissue called *plaque* where bacteria can live and multiply. If the plaque is not removed with daily brushing and flossing, it will harden into a pale-yellow substance called *tartar*, which is easiest to remove with special instruments used by a dentist or dental hygienist. Look at the first tooth in the picture below. The dark area on top is where tartar has collected.

The acids in plaque and tartar eat away at the enamel, leaving a hole behind called a *cavity*. You can see a cavity beginning to form in the second picture. If a cavity is not taken care of by a dentist, the acid eats

deeper and deeper into the layers of the tooth, as in the third picture. Finally, the acid reaches the pulp, causing more pain and infection, as you can see in the last tooth. In these cases, the tooth may have to be pulled.

Visiting a Dentist

Read to the children: Even with frequent and regular brushing and flossing, plaque and tartar can build up in hard-to-reach places that only a dentist can get to. That's why it's important to see a dentist regularly to keep your teeth healthy.



A dentist can also identify any areas where bacteria and acids have begun to break down the enamel and treat the problem before it becomes a cavity.

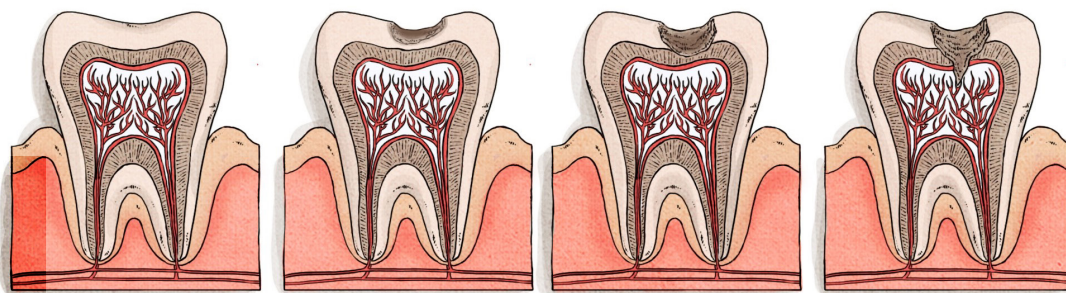
If we do get a cavity, a dentist can fill the hole with a special substance that will block bacteria from doing more damage.

Current research suggests that enamel does not grow back once it is destroyed. Our teeth are responsible for all the biting and chewing that we do, so we should take very good care of them.

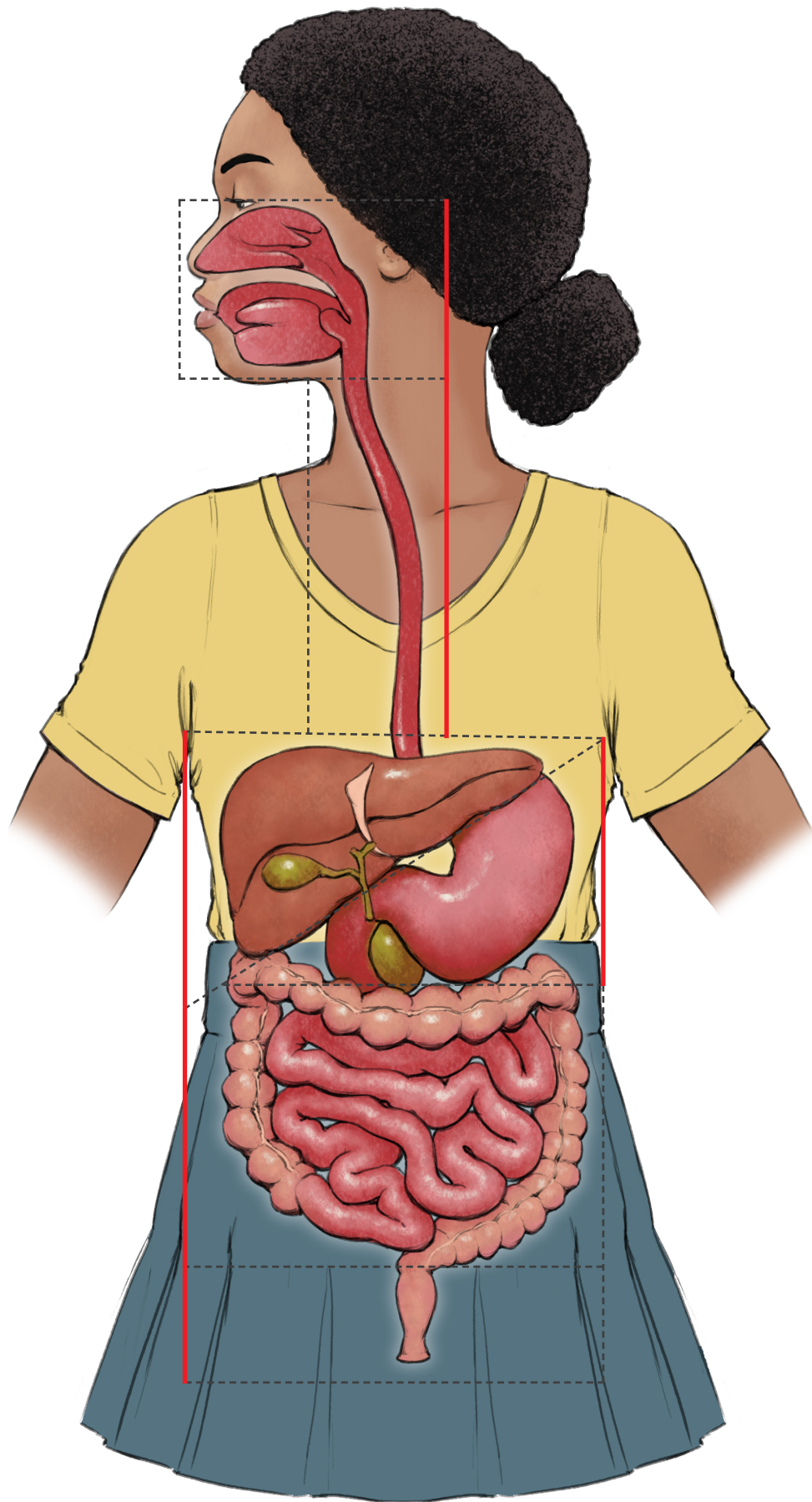
Lesson 2 Extension



Have children grades 7–8 complete the self-directed Lesson 2 extension titled “Dental Care Over the Years” in their student journals.



Digestive System Lift-a-Flap



The Digestive System: Part 2

Objective

Help the children understand the process of digestion and the organs involved.



Preparation:

☐ None

Activity Supplies:

- Saltine cracker for each child
- 1 piece of sandwich bread
- Quart-sized zipper bag
- ¼ cup vinegar, any kind
- Clear drinking glass or bowl
- 2 Tbsp cooking oil, any kind
- 1 Tbsp green dishwashing liquid soap
- Spoon or something to stir with

Where It All Begins



Read to the children: In our last lesson, we learned that digestion begins in the mouth, where food is broken down by chewing and the tongue pushes the food to the throat.

But then what happens?

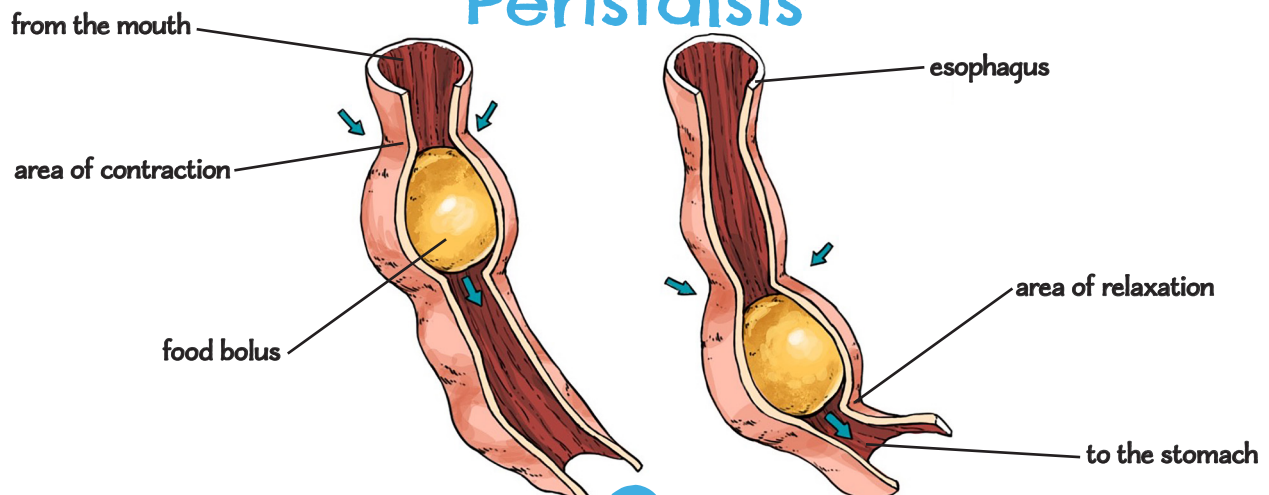
Give each child a cracker. Have the children chew the cracker and swallow, paying close attention to what happens when they swallow.

How do you think the food goes down our throats?

Once food leaves your mouth, it enters the **esophagus**, which is a muscular tube in your throat that ends at your stomach. As food goes down the esophagus, muscles below the food relax while muscles above the food contract. This is a muscular process called **peristalsis** [peh-ruh-STAAAL-suhs], which pushes the food down the esophagus into the stomach.

This muscular movement can be found throughout the digestive system, including in your stomach and intestines.

Peristalsis



IT WENT DOWN THE WRONG PIPE!

You have another tube in your throat called the trachea. It's how air gets into your lungs. At the top of the trachea is a small flap, called the epiglottis [eh-puh-GLAA-tuhs] that covers it whenever you swallow food or drink. If you eat or drink too fast, the flap may not close fast enough, which results in choking or coughing.

Science Wall: Vocabulary Words



Place the vocabulary cards **ESOPHAGUS** and **GASTRIC ACID** on your science wall. Read and discuss the words and definitions.



Churn It Up Activity



Read to the children: After the food is put through the peristalsis process, it drops down into the stomach. The stomach is a stretchy sack about the size of your fist, but it can expand to hold 1–4 quarts of food.

Inside the stomach is a digestive liquid called **gastric acid** that is formed within the lining of the stomach. Gastric acid is so concentrated that if we took it out of the stomach and poured it over a nail, it would eventually dissolve the nail! Why do you think it doesn't dissolve the stomach walls? There is a special mucus lining in the stomach that keeps the acid from eating through. The gastric acid mixes with the chewed-up food, churns it, and breaks it down.

Let's learn what happens in your stomach. The bag will represent your stomach, and the bread will represent your food.



Have the children break the bread into small pieces and put them in the zipper bag.

Breaking up the bread is a lot like what happens when we chew food. Our teeth break the food down into small pieces.



Measure out $\frac{1}{4}$ cup vinegar and add it to the zipper bag. Close the zipper bag tightly. Tape the top if you'd like. Vinegar is a type of acid, so it mimics the gastric acid.



Have the children squeeze and move the bread around inside the bag until it is broken down.



The sloshing and squeezing simulate what the stomach does as it churns the food. **Discuss the following questions with the children:**

1. Why do you think we broke up the bread instead of just putting the whole piece into the bag? [to simulate chewing]
2. What did the vinegar do to the bread? What substance does the body produce that does the same thing to food as the vinegar? [The vinegar soaked into the bread and continued to break it down. Gastric acid.]
3. What happened when we sloshed and squeezed the contents of the bag? What does the stomach do to food that is similar to the sloshing and squeezing? [The bread broke down. The stomach squeezes the food and, along with gastric acid, breaks it down.]

Bile Activity



Read to the children: When the stomach is finished churning and breaking down the food, it is not quite ready to be used by the body as fuel. This is because it is still partially made of fatty substances called lipids, which can't mix with water-based substances like your blood. The food moves to the small

intestine where it mixes with a greenish-brown liquid from the liver called **bile** that helps the lipids and water-based substances mix with each other. Let's simulate what happens in the small intestine when bile mixes with the partially digested food.

Have the children turn to the "Bile Activity" page in Lesson 3 of their student journals. Have the children complete the "Hypothesis" questions at the top of the page. Read to the children: A hypothesis is a guess of what one thinks might happen before doing an experiment or activity.

Supplies:

- Clear drinking glass or bowl
- 2 Tbsp cooking oil, any kind
- 1 Tbsp green dishwashing liquid soap
- Spoon or something to stir with

Instructions:

1. **Add water to the glass. Leave about one inch of space at the top. Ask the children the following questions:** What part of your body does the jar represent? [the small intestine] What does the water represent? [blood]



2. **Add oil (which will represent fat) to the glass. Ask the children the following question:** Which liquid represents the lipids in your food? [cooking oil]



3. **Add dishwashing soap (which represents bile) to the water and oil mixture. Stir. Ask the children the following questions:** Which liquid represents the bile? [dish soap] Were the oil and water able to mix before we added the dish soap? [no] What happened to the oil and water when we added the dish soap and stirred them? [They were able to mix.]



4. **Discuss the following question with the children:** What do you think would happen to our bodies if we didn't have bile? [We wouldn't be able to use the food we eat as fuel.] **Have the children complete the "Results" section of the journal page. The answer key can be found at the end of this lesson.**

Science Wall: Vocabulary Word



Place the vocabulary card **BILE** on your science wall. Read and discuss the word and definition.



The End of Digestion

Show the children "The Digestive System" picture below and have them follow along through the digestive system as you read. Read to the children: Altogether, it takes about four hours for food to go through the small intestine. In the first section of the small intestine, substances that are important for the

body to function are absorbed into the body through the lining. Everything that is left over from the small intestine goes into the large intestine, where mostly water is absorbed by the body. The waste that is left behind gets harder until it becomes a solid. This solid waste is called fecal matter, or feces.

The solid waste enters the rectum, where it stays until you go to the bathroom. When you have a bowel movement, your body pushes the waste from the rectum through the anus and expels it from the body.

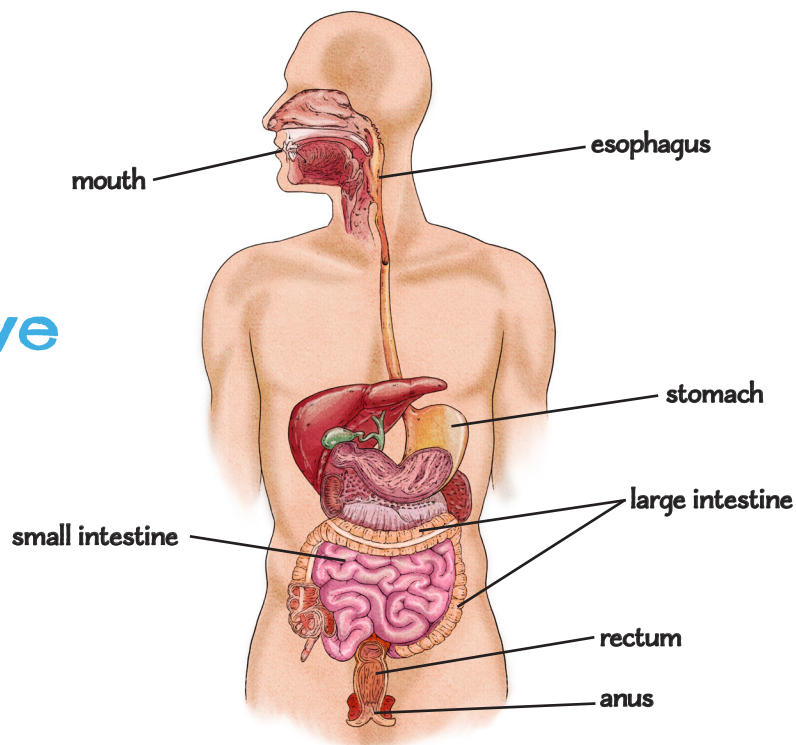
The entire process of digestion can take from 24 to 72 hours depending on what you ate and how fast your body digests food. To keep your digestive system healthy and functioning at its best, you should drink an adequate amount of water for your body size and eat healthy whole foods, such as fruits, vegetables, greens, and whole grains.

Lesson 3 Extension



Have children grades 7–8 complete the self-directed Lesson 3 extension titled "Gastric Ulcers: An Unwelcome Visitor" in their student journals.

The Digestive System



BILE ACTIVITY

3-6 Key

HYPOTHESIS

1 Draw what you think the jar will look like when we add the oil to the water.

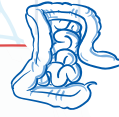
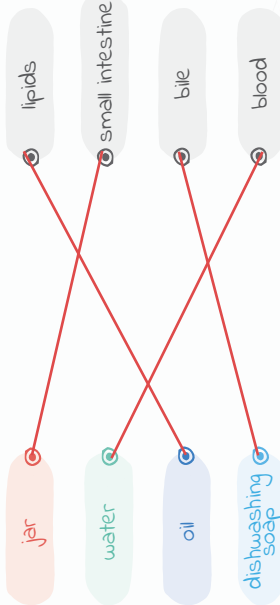
Answers will vary but should include that the two substances will not mix.

2 Circle what you think will happen when we add the dishwashing soap to the oil and water.

- a. The oil and water will stay the same.
- b. The oil and water will mix.

RESULTS

Draw lines to match the materials we used with the things they represent in our bodies.



BILE ACTIVITY

7-8 Key

HYPOTHESIS

1 What do you think will happen when the oil is added to the water?

Answers will vary but should include that the two substances will not mix.

2 What do you think will happen when dishwashing liquid is added to the oil and water?

Answers will vary but should include that the substances will mix.

RESULTS

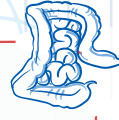
What did the oil do when added to the water?
Answers will vary but should include that the two substances did not mix.

What happened to the oil after the dishwashing liquid was stirred in?
Write down what you observed.

Answers will vary but should include that the dishwashing detergent emulsified the oil, causing it to break into small parts.

How does this activity demonstrate the way lipids are broken down in the body?

Bile works in our bodies to mix with fats to make them more readily digestible as food moves through the small intestine.



The Basics of Nutrition

Objective

Help the children understand the three macronutrients, their dietary sources, and how they're used in the body.



Preparation:

□ Cut out the “Food Cards” in the student journals and remove any cards that show foods your family does not eat. Note: Keep some cards that your family might eat as treats for the purpose of the activity.

Activity Supplies:

- Glue stick

Healthy Food Sort



Place a set of the “Food Cards” in front of each child. Read to the children: “And God said, Behold, I have given you every herb bearing seed, which is upon the face of

all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat” (Genesis 1:29). God created our bodies and the food that sustains us. It is important to honor those gifts by choosing nutritious foods to eat. So much about our bodies is affected by our diets, or what we eat and drink. How well our bodies grow and develop and even how we feel emotionally can be altered by what we eat and drink.

Let's sort our cards into two piles. We will make one pile of foods that nourish our bodies with energizing nutrients. We will call these nutritious foods. In a second pile we will put foods that are better to eat only once in a while. We will call this pile treats. These foods might have added sugars, salt, or fat.



Lay out the food cards faceup. Help the children sort the cards into the nutritious foods and treat foods piles as described previously.

Spread out the treat cards. Why do you think these foods are considered treats? Almost all food has some nutritional value, but there are certain foods that also have added ingredients and fillers that are not beneficial to our bodies. Excess salt, for example, can lead to high blood pressure. Foods that are high in sugar taste very good and are fun to eat in moderation but can also cause problems. Eating too much sugar too often not only causes problems with your health but also fills you up so that you have no room for the healthy, nutritious foods your body needs. **Set the treat cards to the side.**

Science Wall: Vocabulary Word



Place the vocabulary card **FOOD GROUP** on your science wall. Read and discuss the word and definition.



Macronutrients



Spread out the remaining nutritious foods cards. Read to the children: What is it about these foods that make them nutritious? Is it their taste? It's actually because they all

have nutrients. Nutrients are the parts of foods that our bodies use to be able to function and to build and grow everything from cells to muscles. If the most nutrients are found in healthy foods, what do you think can happen to our bodies if we eat mostly foods with few to no nutrients? Our bodies won't be as strong and healthy as they could be and may not grow well.

There are six different types of nutrients that our bodies need.

- Carbohydrates
- Fats
- Proteins
- Water
- Vitamins
- Minerals

Carbohydrates, fats, and proteins are called *macronutrients*, nutrients that we need to eat in large amounts. We'll be learning about them in this lesson.



Carbohydrates are one of the main sources of energy for the human body. Carbohydrates are broken down into glucose, which is then used by your body to create energy. Glucose can also come from foods such as honey, agave, and dried fruit. Some organs, such as your brain, must have glucose to function properly.

Use the answer key at the end of this lesson to help the children sort out the food cards that are sources higher in carbohydrates and fill in the circle next to "Carb" on each card.



Fats are used to store vitamins, produce hormones, protect your organs, and promote energy and growth. Our bodies need healthy fats to function properly. Fats are found in foods like meat, poultry, eggs, nuts, seeds, and milk products.

Use the answer key at the end of this lesson to help the children sort out the food cards that are better sources of fat and fill in the circle next to "Fat" on each card.

The final macronutrient is *protein*, which is vital for growth. When we eat foods that provide protein, our bodies break down the protein into small, usable molecules called amino acids and then make amino acids into new proteins. Protein is found in foods like meat, fish, poultry, eggs, milk, nuts, seeds, beans, and peas.



Use the answer key at the end of this lesson to help the children sort out the food cards that are better sources of protein and fill in the circle next to "Protein" on each card. Leave all the cards on the table.

The Food Groups



Read to the children: All the foods and drinks we consume affect our bodies' growth and development both now and in the future. It's important to eat a variety of foods every day because no one food contains all the nutrients your body needs. Remembering which foods have which nutrients in them can be hard! It is much easier to remember *food groups*.

Food groups are made up of a variety of foods that have similar essential nutrients in them. For example, milk, yogurt, and cheese are all made from the milk of mammals, such as cows and goats, and contain calcium, so they are grouped into the dairy food group. There are five common food groups.

- Fruits
- Vegetables
- Grains
- Proteins
- Dairy

Eating from a variety of food groups every day and changing up what you eat from each group are great ways to ensure you are eating well.

Build a Healthy Meal



Have the children turn to the “Build a Healthy Meal” page in their student journals and paste one favorite food card from each food group below onto the plate. Note: Feel free to adjust to any specific food needs your family has, such as a dairy allergy or intolerance.

Fruits

Banana
Orange
Pineapple

Vegetables

Broccoli
Carrots
Potato

Grains

Bagel
Bread
Crackers
Croissant
Muffin
Pancake
Pasta
Waffle

Proteins

Almonds
Beans
Beef
Chicken
Eggs
Fish
Ham
Peanuts
Shrimp
Sunflower Seeds

Dairy

Cheese
Milk
Yogurt

Lesson 4 Extension



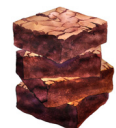
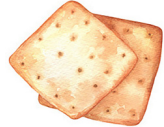
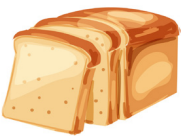
Have children grades 7–8 complete the self-directed Lesson 4 extension titled “Career Spotlight: Registered Dietician” in their student journals.



Food Cards

Key

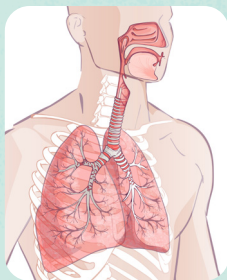
Note: Many foods have a combination of carbohydrates, fats, and proteins. We have marked which macronutrients each food is high in, based on information provided by the Food and Nutrition Information Center of the USDA.

● Carb ● Fat ● Protein  Almonds	● Carb ● Fat ○ Protein  Muffin	● Carb ○ Fat ○ Protein  Bagel	● Carb ○ Fat ● Protein  Banana	● Carb ○ Fat ● Protein  Beans
○ Carb ● Fat ● Protein  Beef	● Carb ○ Fat ○ Protein  Orange	● Carb ● Fat ○ Protein  Pancake	● Carb ○ Fat ● Protein  Broccoli	● Carb ● Fat ○ Protein  Brownie
● Carb ○ Fat ○ Protein  Pasta	● Carb ○ Fat ○ Protein  Carrots	● Carb ● Fat ● Protein  Peanuts	○ Carb ● Fat ● Protein  Cheese	● Carb ○ Fat ● Protein  Pineapple
○ Carb ● Fat ● Protein  Chicken	● Carb ○ Fat ● Protein  Potato	○ Carb ○ Fat ● Protein  Shrimp	● Carb ● Fat ● Protein  Sunflower Seeds	● Carb ● Fat ○ Protein  Crackers
● Carb ● Fat ○ Protein  Croissant	● Carb ● Fat ● Protein  Yogurt	● Carb ● Fat ● Protein  Waffle	○ Carb ● Fat ● Protein  Eggs	○ Carb ● Fat ● Protein  Fish
● Carb ● Fat ○ Protein  Fries	● Carb ○ Fat ○ Protein  Bread	○ Carb ● Fat ● Protein  Ham	○ Carb ● Fat ● Protein  Ice Cream	● Carb ● Fat ● Protein  Milk

The Respiratory System

Objective

Help the children understand the features of the respiratory system, how the human body breathes, and the importance of the lungs.



Preparation:

- Remove the “Breathe In, Breathe Out” activity page.
- Cut out the “Breathe In, Breathe Out Cards.”

Activity Supplies:

- 2 bendy straws
- Electrical tape
- Scissors
- Rubber bands
- 3 large, uninflated balloons
- 64-ounce plastic fruit juice bottle
- Clay or play dough
- Glue stick

Balloon Blowing Activity



Hand each child a deflated balloon. Have each child blow up his or her balloon, pinch the open end closed, and then release it. Do this a few times. If the child is too young or unable to blow up the balloon on his or her own, you can demonstrate by blowing up the balloon instead.

Read to the children: What caused the balloon to inflate, or get bigger, when you blew into it? When you blew into the balloon, you forced tiny air particles from your lungs into the balloon, which then bounced around the inside walls of the balloon and created enough air pressure to force the balloon to grow larger and inflate. What happened when you released the balloon? All the air came out, and the balloon deflated.

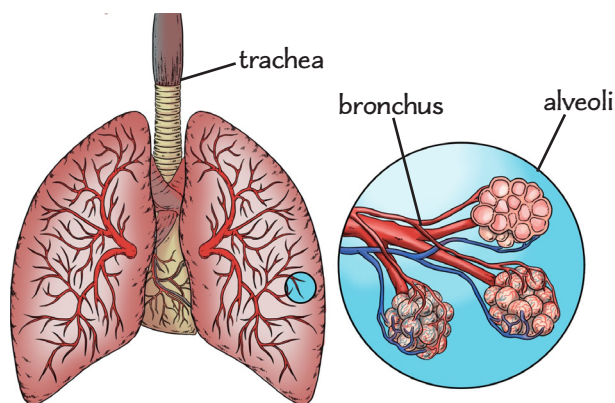
The air that you blew into your balloon came from your lungs, which are a very important part of your respiratory system. God has designed your lungs to keep your body alive and healthy from the very moment you are born into this world. Your lungs are hard at work every time you cough, sneeze, or hiccup.

They are even working when you take a big breath to smell Mom’s delicious cookies baking in the oven! Not only that, but without a continual supply of air containing a gas called oxygen, you could not live. Let’s take a closer look at how your entire respiratory system functions and why your lungs are so important.

The Respiratory System Video



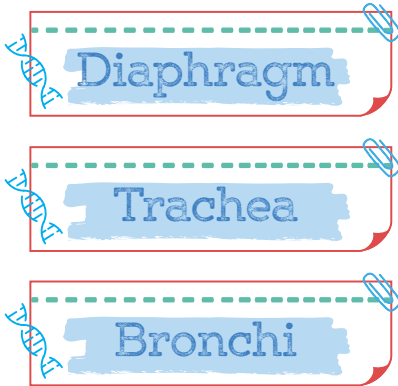
Watch the video titled “The Respiratory System” at goodandbeautiful.com/sciencevideos or on the Good and Beautiful Homeschool app.



Science Wall: Vocabulary Words



Place the vocabulary cards **DIAPHRAGM**, **TRACHEA**, and **BRONCHI** on your science wall. Read and discuss the words and definitions.



Breathe In, Breathe Out Activity

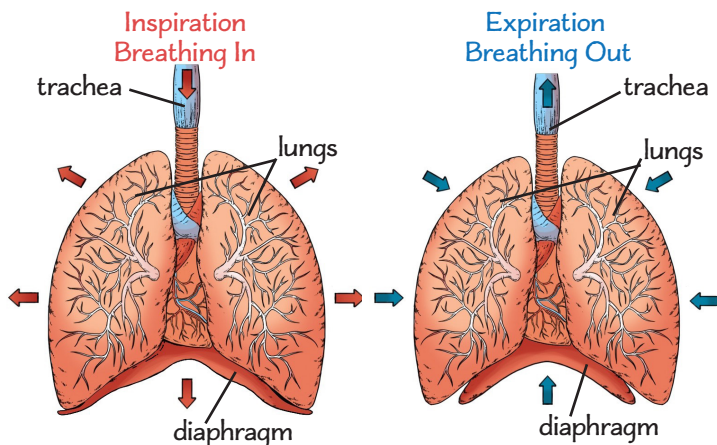


Have the children turn to the “Breathe In, Breathe Out” page in Lesson 9 of their student journals. Read to the children:



We are going to do an activity to see what happens to oxygen when we breathe in and how carbon dioxide is expelled when we breathe out.

Lay out the nine “Breathe In, Breathe Out Cards” and the “Breathe In, Breathe Out” page from the lesson. Have the children pick the number 1 card and then find the number 1 on the diagram in order to see where the details on the card will be taking place in the body. Then read or have the children read the



information on the card. Repeat this process, going in numerical order, until all nine cards have been read. Have the children label the student journal page as each card is read.

Human Lung Simulator Activity



Read to the children: Let’s do a simulation to see how the lungs work when you are breathing.

1. Tape the long end of the bendy straws together using the electrical tape. The straws represent the **trachea** and **bronchi** where air enters and exits the lungs.
2. Place a balloon around the bendy end of each straw. Use rubber bands to secure the balloons in place. Make sure that the seal is airtight. These balloons represent the lungs.



3. Cut the bottom of the 64-ounce bottle off, keeping the edges as even as possible. The bottle represents the chest cavity, which houses our lungs.
4. Place the long end of the straws up through the mouth of the bottle so that about an inch is above the bottle opening.
5. Use the clay or play dough to seal the mouth opening around the straws. You want this to be airtight around the straws.



6. Tie a knot at the end of the third balloon, and then cut the tip of the balloon's larger side off. Stretch the balloon over the bottom of the bottle, leaving the tied end hanging beneath. This balloon represents the **diaphragm**.



Using the tied knot, pull down gently on the balloon representing the diaphragm. What did you notice about the balloons inside the bottle as you pulled on the balloon? When you breathe in, your rib cage expands, and your diaphragm contracts and flattens, pulling air into the lungs. This is called *inspiration*.

Now, let go of the balloon. What did you notice about the balloons when you let go? When you breathe out,

your rib cage contracts, and your diaphragm relaxes, which pushes all of the air back out of the lungs. This is called *expiration*.

■ Lung Health

Read to the children: Your body and its many cells and tissues cannot survive without breathing clean, fresh air with strong and healthy lungs. Our lungs and their delicate structures can be easily damaged by unhealthy lifestyle choices, such as smoking and abusing illegal drugs. Keeping our lungs in tip-top shape is as easy as keeping the rest of our bodies healthy—by staying active and making healthy food choices. Sticking to healthy choices can be challenging, but your body will always feel and perform better when you do!

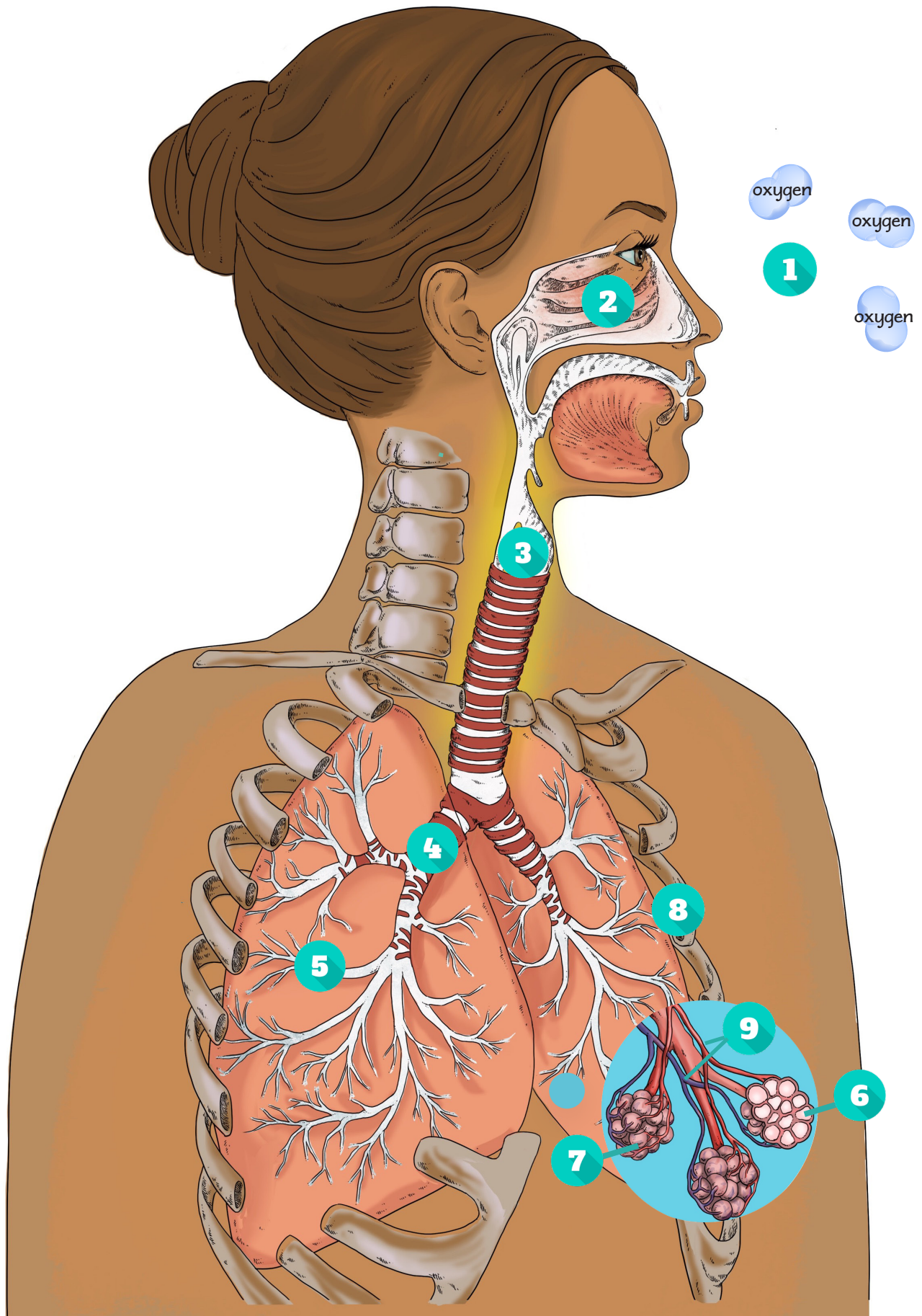
■ Lesson 9 Extension



Have children grades 7–8 complete the self-directed Lesson 9 extension titled “Polio and the Amazing Iron Lung” in their student journals.



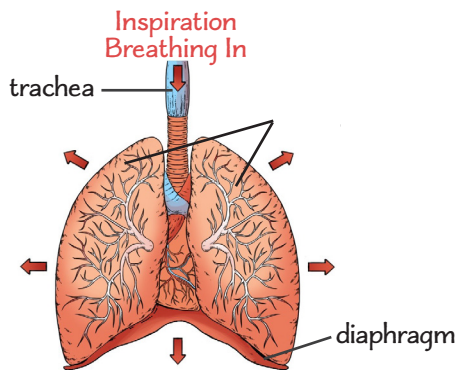
Breathe In, Breathe Out



1 INSPIRATION

Also called inhalation, this is the process of breathing in oxygen, which is then delivered to all parts of our bodies. A muscle below the lungs called the *diaphragm* pulls downward when you breathe in, allowing the lungs and muscles between the rib cage to expand, drawing air in through your nose (or mouth) and down the trachea to fill the lungs.

Touch your stomach area as you breathe. Feel how your diaphragm causes your lungs to expand.



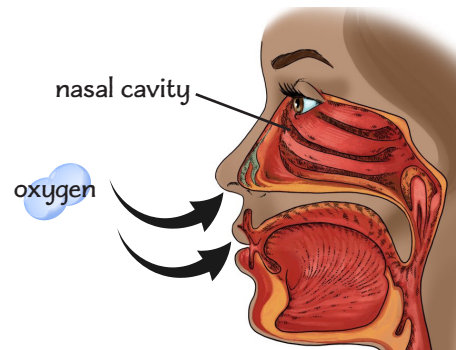
2 NASAL CAVITY OR MOUTH

When air is drawn into your nose, it enters an area called the nasal cavity. Here very small hairs help collect any dust or unwanted particles that come in with the air.

Place your hand under your nostrils to feel the air flow in and out of your nasal cavity.

When air is drawn into your mouth, the air goes directly into your trachea.

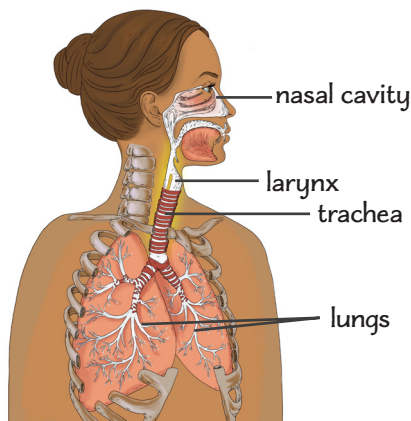
Place your hand in front of your mouth and breathe onto it to feel the air flowing.



3 LARYNX & TRACHEA

From your nasal cavity, air travels through your larynx [LEH-rings] (voice box) and trachea [TRAY-kee-uh]. The trachea is a tube lined with ring-shaped pieces of cartilage.

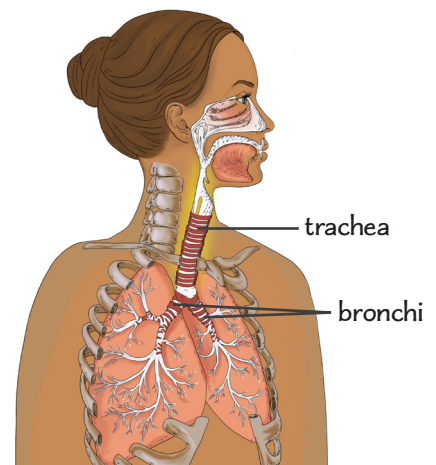
Feel the front of your neck. Do you feel the lumps of the ring-shaped cartilage? These pieces of cartilage help keep the trachea open so that air can flow freely through it.



4 BRONCHI

When the air reaches the base of your trachea, it splits into two tubes, one leading to the left lung and the other to the right lung. These tubes are called the bronchi (singular: bronchus).

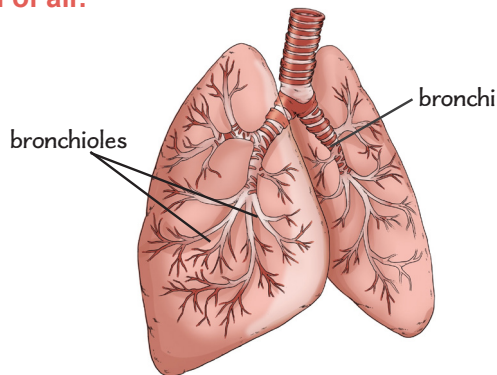
Place your hand on your chest to feel it move as you slowly take in a breath of air.



5 BRONCHIOLES

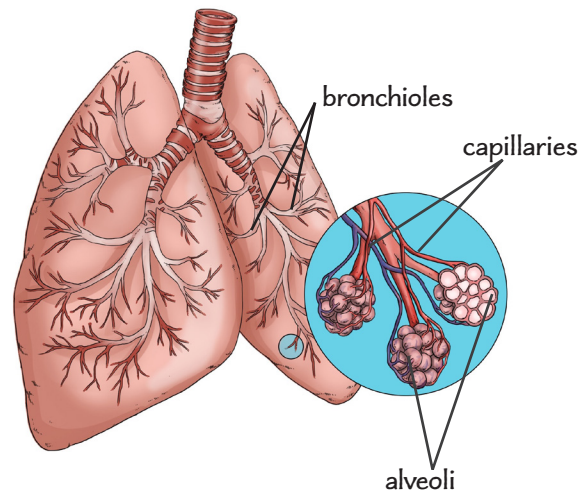
Inside your lungs the bronchi [BRAANG-kai] branch outward like the branches of a tree. As the bronchi branch out, they become narrower in size. Once the bronchi have become very narrow airways, they are called bronchioles (singular: bronchiole).

Place your hands on either side of your rib cage. Feel it expand as you take in a deep breath of air.



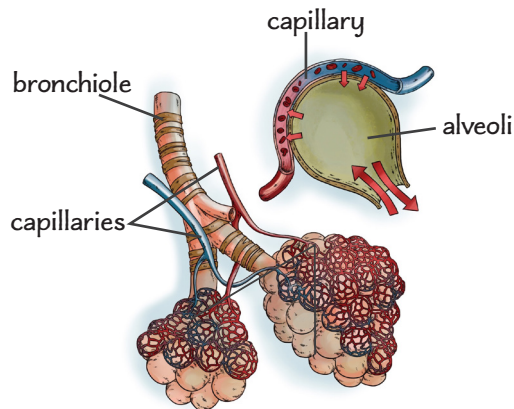
6 ALVEOLI

At the end of each bronchiole is a bundle of small air sacs called alveoli [al-VEE-uh-lai]. Each alveolus is wrapped in tiny blood vessels called capillaries.



7 GAS EXCHANGE

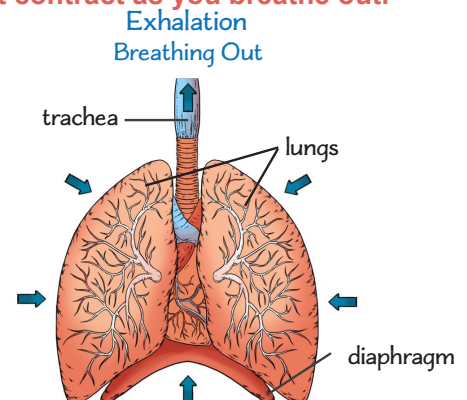
Oxygen (red arrows) passes through the walls of the alveoli into your capillaries and enters your bloodstream. At the same time, carbon dioxide that was collected from your body is transferred from your capillaries into your alveoli.



8 EXHALATION

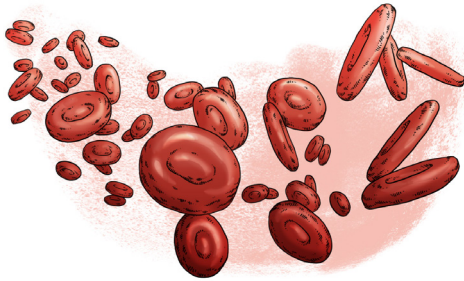
When you exhale (breathe out), your diaphragm relaxes upward against the lungs, causing the air, including carbon dioxide, to leave and go out through your nose or mouth. Without exhalation the carbon dioxide would build up in your body and cause mild to severe symptoms.

Place your hands on either side of your rib cage. Feel it contract as you breathe out.



9 BLOODSTREAM

The oxygen that moved in through your capillaries now begins to travel on red blood cells through your bloodstream, pumped by your heart, taking the oxygen to all parts of your body. The oxygen then helps to provide the energy your body needs to function.

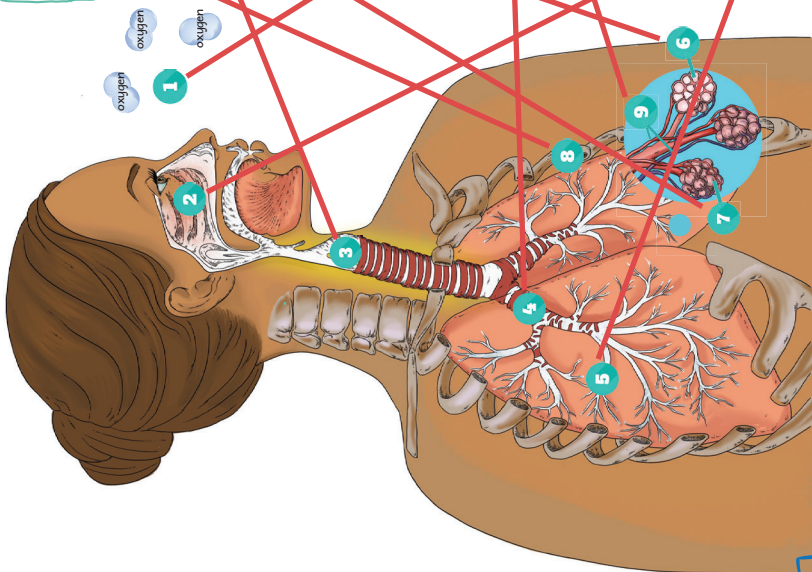


BREATHE IN. BREATHE OUT

Key

Unscramble the words and write them correctly in each box. Then draw a line from the word to the correct number.

- Exhalation
- Larynx & Trachea
- Gas Exchange
- Inspiration
- Alveoli
- Bronchi
- Bloodstream
- Nasal Cavity
- Bronchioles



- WORD BANK
- Nasal Cavity
 - Bronchi
 - gas Exchange
 - Bloodstream
 - Bronchioles
 - Exhalation
 - Inspiration
 - Alveoli

The Skeletal System

Objective

Help the children identify the name and location of major bones, the types of joints, and the structure of bones.



Preparation:

- ☐ Cut out the “Bones Matching Cards” and the “Joints Matching Cards.”

Activity Supplies:

- Pen or pencil

Optional Read Aloud



At any point in the lesson, you may read *50 Amazing Facts About Bones* by Jessica Jung, available in the optional book pack for this unit.

Introduction

Read to the children: Have you ever seen a house that is being built? If so, you may have seen something that looks like this.

This is called a frame. It is the part of the house that holds it up. When the house is all finished with floors, walls, and ceilings, we don't see the frame anymore, but it's still there providing the structure and support for the house.

Your body has a frame, too. It is called the skeletal system. It provides a frame for your body and protects all of your major internal organs as well. An adult skeletal system has 206 bones.

What Are Bones Made Of?



Have the children turn to the “Parts of a Bone Matching” worksheet in Lesson 10 of their student journals and draw a line to match the parts of a bone to the diagram as you read. Older children will write the name of the structure above the description and then draw a line to match. The answer key can be found at the end of this lesson.



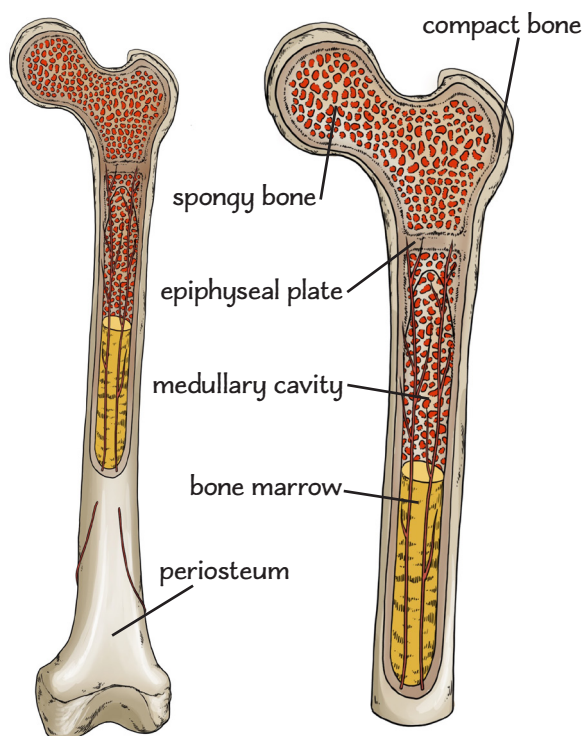
Read to the children: While there are lots of different bone sizes and shapes in our bodies, bones are all made of the same materials.

- The outside of our bones has a hard outer cover called the **periosteum** [pair-ee-AH-stee-uhm] protecting it.
- The next layer is called **compact bone**. It is a very dense layer that provides strength and protection.
- Beneath the compact bone is a porous layer of **spongy bone** (also called cancellous) that is softer and weaker than compact bone because it has bigger holes.

Most bones in our bodies have only these three parts, but long bones have some additional parts.

- The **medullary** [muh-DOO-luh-ree] **cavity** is a long, narrow column inside the spongy bone that holds bone marrow.
- This soft **bone marrow** tissue is where red blood cells, white blood cells, and platelets are created.

The **epiphyseal** [eh-puh-FIH-zee-uhl] **plate** is tissue that allows the bone to grow in length. After children finish growing, this area hardens and becomes the epiphyseal line.



Healthy Bone Growth

Read to the children: Our bones grow all through childhood. While children are growing, they need a lot of calcium, which is found in foods like milk, broccoli, oranges, leafy greens, canned salmon and other canned fish, and soybeans. Calcium helps bones grow, so if there isn't enough calcium in a child's diet, his or her bones could become weak or brittle or not grow as they should.

Remodeling is a process where new bone tissue is formed after older bone is broken down and enters the bloodstream. Remodeling never stops. In fact, your skeleton will completely regenerate every ten years or so!

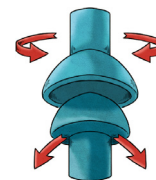
Something else that is very important for having strong bones is exercise. Just like muscles, which respond to the stress exercise puts on the body by becoming stronger, bones respond to lifting and carrying extra weight by becoming denser and stronger.

Types of Joints

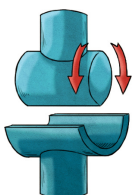
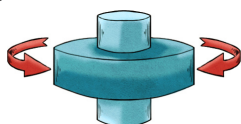
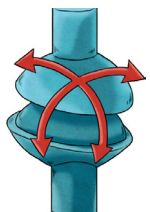
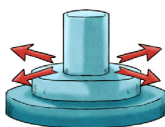
Read to the children: There is one more very important part of the skeletal system—the joints! A **joint** is a special structure of the body where two or more bones come together.

Our bodies would be very stiff if we didn't have joints. They allow the bones of the skeletal system to work together so that we can dance, walk, flip, run, and move around in hundreds of different ways. Let's take a closer look at the different types of joints found in the body.

- The **ball-and-socket joint** is found in our hips and shoulders. One of the bones in the joint is round on the end, like a ball. The end of the other bone is concave, making a cup to fit around the first bone, allowing it to move freely. This joint allows the greatest range of motion.



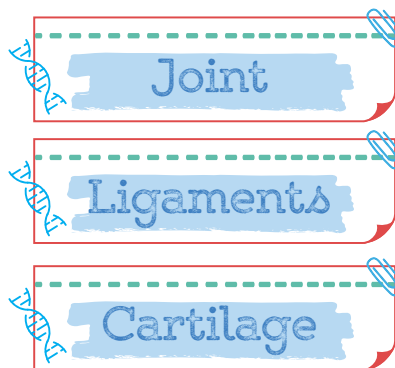
- A **plane joint** is found in our ankles. This joint allows two or more flat bones to move freely against each other. The gliding motion allows for a lot of flexibility but not as much range of motion.
- We have **saddle joints** at the base of our thumbs. Saddle joints are very flexible but also provide stability and strength because they do not allow rotation.
- The joints found in our wrists are **condyloid** [KAHN-dih-loid] **joints**. These joints allow for movement but no rotation.
- A **pivot joint** is located at the base of the skull and connects the skull to the spine. It only allows movement sideways and back and forth.
- The **hinge joint** is the hardest-working joint in the body! It is found in our elbows, knees, and fingers. Hinge joints allow back and forth movement only, like a door!
- Some joints are immovable, such as the sutures between the bones of our skulls. These are called **fixed joints**.



Science Wall: Vocabulary Words



Place the vocabulary cards **JOINT**, **LIGAMENTS**, and **CARTILAGE** on your science wall. Read and discuss the words and definitions.



Skeletal Match Activities



Place the two Skeletal Match Games, "Bones" and "Joints," in front of the children. Mix up the "Bones" and "Joints" Matching Cards and place them facedown.

Have the children take turns drawing a card, reading it, and matching it to the same part on either the "Bones" or "Joints" Skeletal Match page.

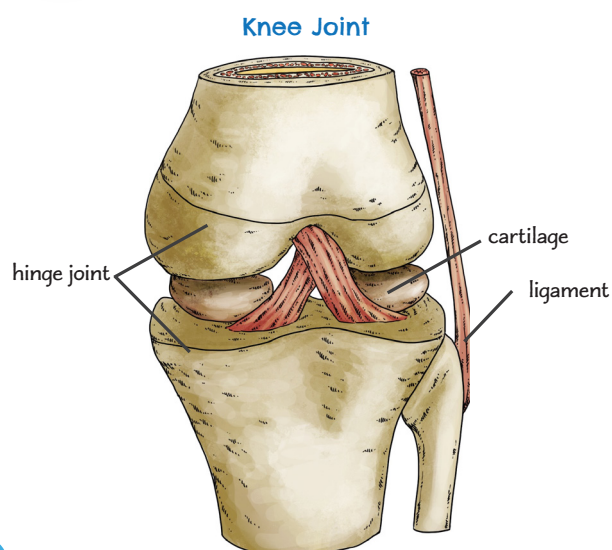
Lesson 10 Extension



Have children grades 7–8 complete the self-directed Lesson 10 extension titled "Prosthetics" in their student journals.



Bones are connected to each other at the joint by **ligaments**, which are very strong bands of tissue. Where the bones of a joint meet, they are covered by a very flexible but strong tissue called **cartilage**. The cartilage works like a cushion to keep the bones from rubbing and grinding together at the joints.



The Musculoskeletal System

Objective

Help the children identify how ligaments, tendons, and muscles function in the human body.



Preparation:

☐ None

Activity Supplies:

- Crayons or colored pencils
- 2–3 plastic straws per child
- String or yarn
- Tape or 5 paper clips per child
- Scissors

Video: The Musculoskeletal System



Have the children watch the video titled “The Musculoskeletal System” at goodandbeautiful.com/sciencevideos or on the Good and Beautiful Homeschool app.

Major Skeletal Muscle Groups

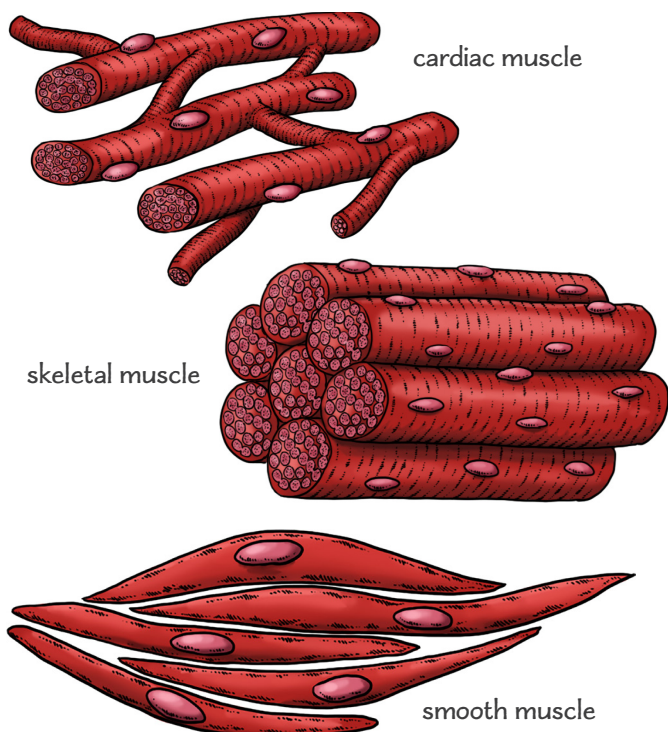


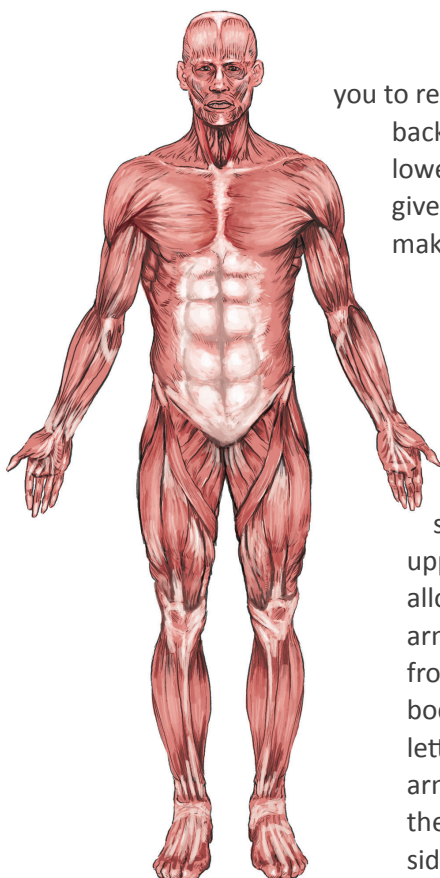
Read to the children: There are over 600 muscles in your body! While it would be impossible to study all of them in this unit, there are a few major muscle groups you should be familiar with.

Have the children turn to the “Major Muscle Groups” coloring pages in Lesson 11 of their student journals.

As we talk about each muscle group, find that group and color it the same color as the muscle group name in the key. **The answer key can be found at the end of this lesson.**

- The **biceps** and **triceps** are both found in your upper arm. The biceps are located in the front, and the triceps are in the back. These muscle groups attach to your radius and ulna and work together to bend and straighten your arms, as we saw in the video.
- The **deltoid** muscles are also known as shoulder muscles, and they attach to the humerus bone in your upper arm. They have a front, middle, and back section. Deltoids provide the greatest range of movement of any part of the body. They allow





you to reach forward and backward, raise and lower your arm, and give you the ability to make a thumbs-up or thumbs-down motion.

- The **pectoral** muscles are also known as chest muscles. These stretch across your upper chest area and allow you to move your arms toward and away from the center of your body, as if making the letter "T" with your arms and then bringing them down to your sides.

- The **abdominal muscles** are found in a column along the center of your abdomen.
- The **oblique** muscles are found on either side of the abdominal muscles. These muscle groups work together with the abdominal muscles to help hold your body posture upright, give you stability and balance, protect your internal organs, and prevent your lower back from being strained when you lift something.
- The **quadriceps** muscles are found in the front thigh area. They flex your hip and extend your knee to thrust your leg forward into a straightened position.
- The **hamstring** muscles are found in the back thigh area. They flex your knee, extend your thigh, and allow your tibia to rotate.
- The **gastrocnemius** [ga-straa-NEE-mee-uhs] muscle attaches at the back of the femur and extends all the way down the back of the leg, or the calf, to the Achilles tendon in the heel. It works with the soleus [SEW-lee-uhs] muscle to help you to bend your knee and point and flex your toes.
- Finally, the **gluteal** muscles, commonly called "glutes," are located on the buttocks area. The

largest muscle in this group is the gluteus maximus. These muscles help your thigh extend and abduct, or move away from the center of your body.

Hand Model Activity



Read to the children: As you can see on your "Major Muscle Groups" coloring page, there are a few muscle groups that we did not talk about. Those are not colored on your coloring page. One of those groups is in the hands and forearms. Did you know there aren't any muscles in your fingers that make

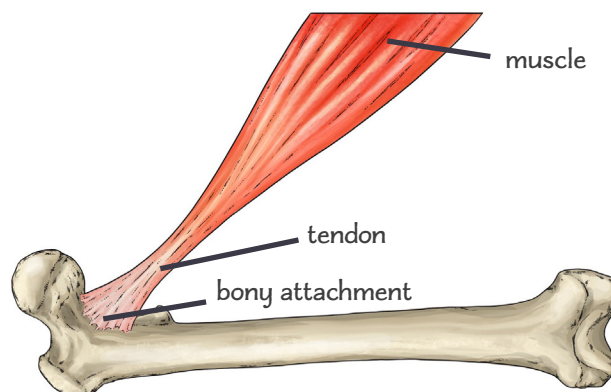
the fingers move? The muscles that move your fingers are actually found in the palm of your hand and your forearm. Attached to these muscles are **tendons**, or flexible cords, that connect the muscle to a bone and allow the fingers to move.

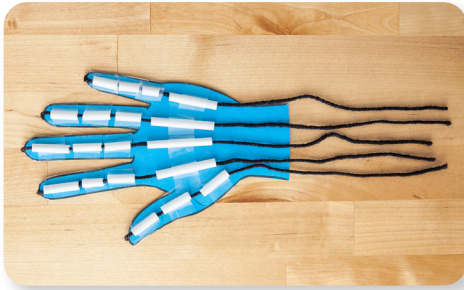


Look at the back of your hand while flexing your fingers open and closed. Do you notice any lines underneath the skin on your hand that look like the ones pictured here? Those are tendons, and they are attached

to the muscles in your forearm that help you extend your fingers.

You also have tendons in your wrist and palm that are attached to muscles that help your fingers bend, but these are not as easy to see as those in the back of your hand.





Let's do an activity that will help us see how the tendons in your palms work.

Have the children turn to the "Hand Model" page in Lesson 11 of their student journals and complete the hand model by following these instructions:

1. Cut out the hand and lay it on a flat surface.
2. Using the lines on the "Hand Model" page as a guide, cut the straws into three shorter pieces per finger and thumb and four longer pieces for the tendons in the hand.
3. Tape the straw pieces onto the hand model, leaving a small space between them. Make sure they are straight on the finger.
4. Cut the string into 5 pieces, each long enough to go from the tips of the fingers to a few centimeters past the bottom of the hand. Thread the string down each finger through the pieces of straw, going from the fingertip and down through the hand past the wrist. Be careful not to pull the string all the way through.
5. Use a piece of tape or a small paper clip on the end of the string to secure it at the top of each finger.

The strings in our hand model represent the tendons in our wrists and palms that help our fingers curl in, and the straws represent the bones. What happens to the fingers when you pull the strings? [They should curl in.] Do you remember what pulls on those tendons to make the fingers move? [muscles] There are skeletal muscles at the base of the thumb and in the palm of the hand that help move the fingers, as well as important muscles in the forearm where most finger and arm movements begin.

Science Wall: Vocabulary Word



Place the vocabulary card **TENDON** on your science wall. Read and discuss the word and definition.



Exercise Adventures Videos (Optional Activity)



Have the children follow along with The Good and the Beautiful's *Exercise Adventures for Kids* videos by viewing them on The Good and the Beautiful Kids YouTube channel.

Lesson 11 Extension

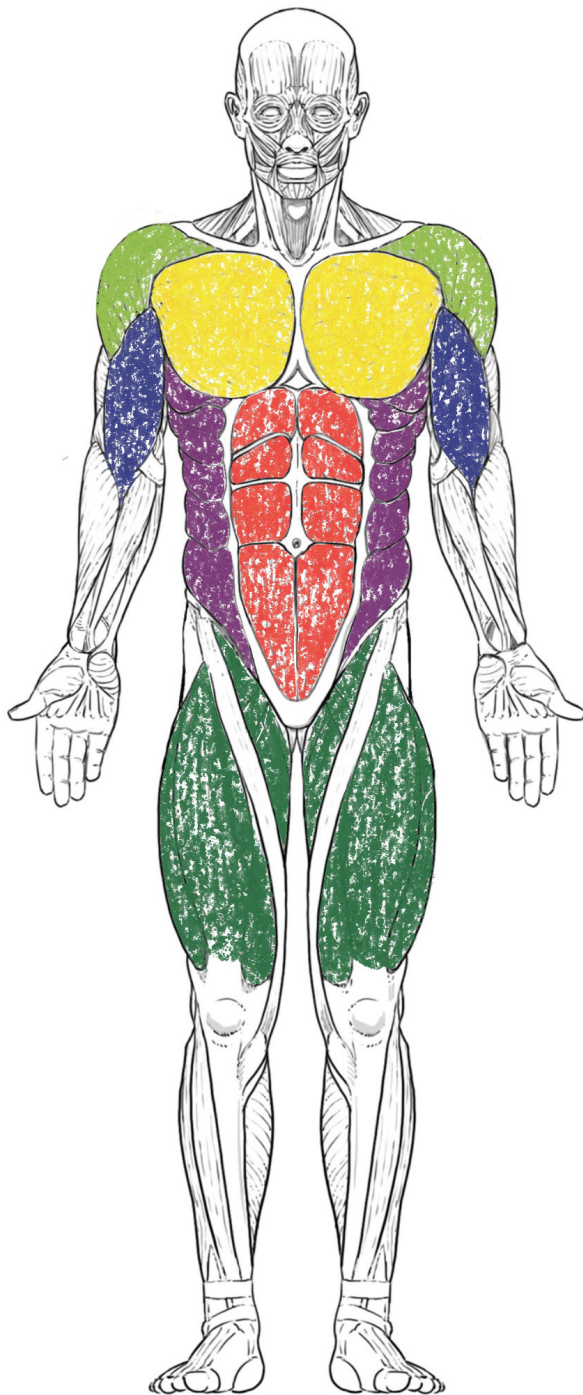


Have children grades 7–8 complete the self-directed Lesson 11 extension titled "Muscle Fatigue" in their student journals.



MAJOR MUSCLE GROUPS

Key



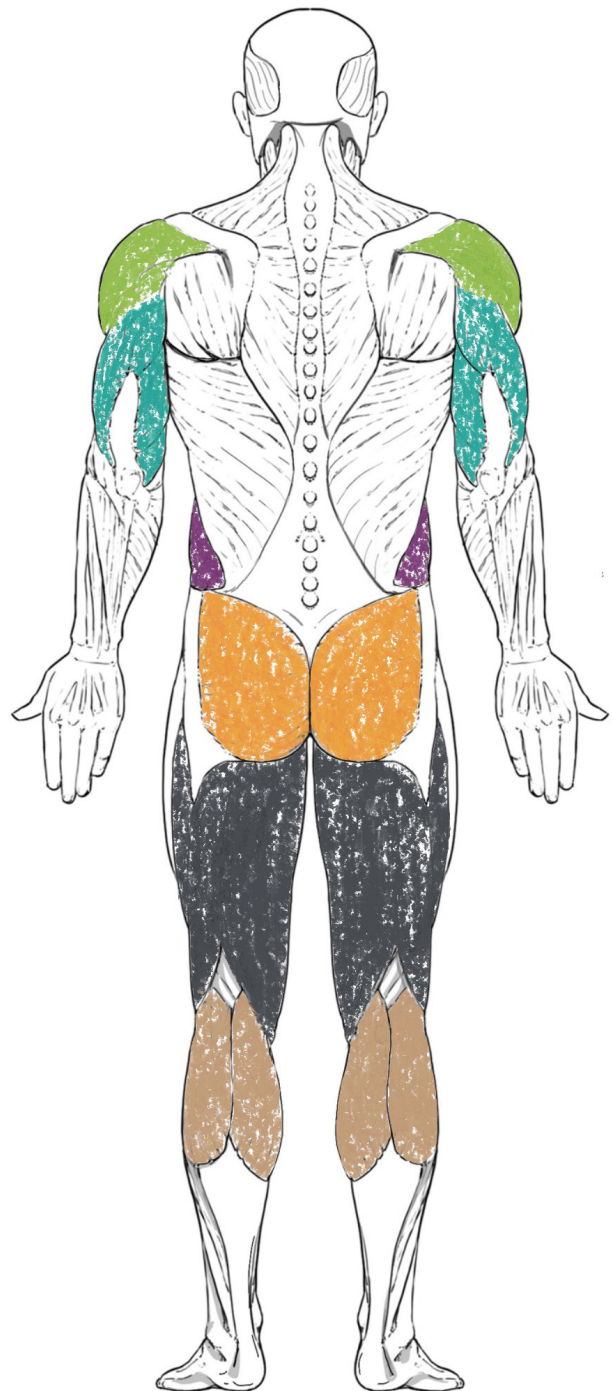
Biceps

Triceps

Abdominal Muscles

Quadriceps

Hamstrings



Pectoral

Obliques

Deltoids

Gastrocnemius

Gluteals

Healthy Lifestyle Seek & Find *Key*



Discussion Points:

Eating a healthy meal

Eating lots of fruits, vegetables, grains, proteins, and healthy fats will help you stay strong and regain health quickly when sick.

Exercising

Regular exercise keeps your body strong and working its best.

Sleeping

Getting plenty of sleep helps your body restore itself and heal.

Praying

Times of peace can help restore both soul and body.

Playing outside

Our bodies create Vitamin D naturally when out in the sunshine, which strengthens our bodies' ability to fight off sickness. The fresh air is also good for keeping our lungs clean and healthy.

Washing hands

Keeping your hands clean can help cut down on the spread of germs.

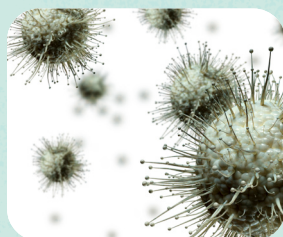
Studying God's word

Life has challenges and stresses for everyone, which can weaken the body. Studying God's word every day brings us joy and peace that restore our minds and bodies.

Genes and Unique Features

Objective

Help the children learn about genes and DNA and understand the difference between dominant and recessive traits.



Preparation:

☐ None

Activity Supplies:

- 1 red pipe cleaner per child
- 1 blue pipe cleaner per child
- 1 white pipe cleaner per child
- Pony beads, 4 different colors per child
- A pencil
- Transparent tape
- Scratch paper
- Mirror

Introduction to Genes

Read to the children: Have you ever heard someone say, “They look just like their mom!” or “They’ve got their dad’s eyes, that’s for sure?” How is it possible that you have certain features in common with your parents? Genetics is what makes it possible for you to share common physical or personality features with one or both of your parents. You get half of your **genes** (the information that determines how you grow, look, and some of your personality) from your mother and half from your father.



Video: Genes and Genetic Mutations

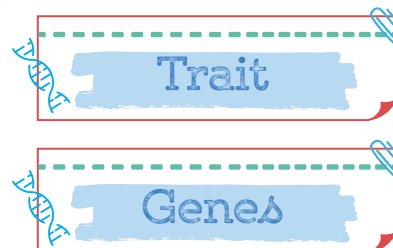


Watch “Genes and Genetic Mutations” at goodandbeautiful.com/sciencevideos or on the Good and Beautiful Homeschool app.

Science Wall: Vocabulary Words



Place the vocabulary cards **TRAIT** and **GENES** on your science wall. Read and discuss the words and definitions.



DNA Model



Give the children the pipe cleaners and the beads. Cut the white pipe cleaner into four sections. Sort the beads into separate piles by color. Read to the children: As we learned