

Anatomy Wonder No. 19: The Basics of a Body

Welcome to Anatomy Wonder No. 19: The Basics of a Body.

In this unit, you'll be introduced to the basic structure of a body: cells, tissues, systems, organs, and body systems.

There are 8 "big picture" messages to focus on during this unit:

1) At the beginning of the physics wonders, you learned that all matter is made of atoms. Atoms are the building blocks for all things. You also learned that atoms join together to form molecules.

2) Molecules join together to form many things, and in your body, they join together to form cells.

3) Your body is made up of trillions of cells, and they each have a specific function, or job. Some cells carry oxygen through your body. Some cells fit tightly together to form your skin. Some cells help you move. Some cells store energy for you to use for movement later. You need a microscope to see the individual cells that make up your body. (We'll dive deep into cells more in Wonder 34.)

4) Groups of cells join together to form tissues. There are four main kinds of tissue in the human body. Nerve tissue is made of connected nerve cells. It helps your body to send messages from your brain to everything else (like your muscles and your heart.) Epithelial tissue is made of three different kinds of connected cells. It creates the linings inside and outside of your body (like your skin.) Muscle tissue is made of connected cells that relax and contract, which allows you to move, push food through your body, and pump oxygen-rich blood to your organs. Connective tissue helps to hold everything together: your organs, your muscles, your bones--all of you!

5) Tissues combine to make larger structures called organs. Organs have specific jobs to carry out, kind of like a specialized machine. You have many organs in your body, such as your brain, your stomach, and your heart.

6) Organs work together to form organ systems or body systems. In these systems, different organs work together to complete a series of related jobs, day in and day out, to keep you alive. For example, your respiratory system works to help you to bring oxygen into your body, which every cell needs in order to function. It also helps to get rid of carbon dioxide in your body, which is released by cells when they use oxygen.

7) The human body has many systems, and we'll be diving into them during Wonders 20 and 24 - 35. They are: the digestive system, the skeletal system, the muscular system, the cardiovascular system, the respiratory system, the urinary system, the nervous system, the immune system and lymphatic system (which use the same organ system), the reproductive system, the integumentary system, and the endocrine system.

8) Let's review. Atoms form molecules, molecules form cells, cells form tissues, tissues form organs, and organs form organ systems. All of this together is what makes your wonderful human body!

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1. For the Minimalists:

Talk about the "big picture messages" together and read the following pages:

- *DK Smithsonian Human Body!*: 7 - 9, 20 - 21
- *Anatomicum*: preface and pages 1 - 5

2. For the Book Basket Folks:

Read *Human Body Theatre* by Maris Wicks at your leisure over wonders 19 - 36

- *Professor Astro Cat's Human Body Odyssey*: pages 2 - 9

3. For the Visual Learners (always screen first):

Magic School Bus, Season 4, Episode 6 "Goes Cellular"

From the Laboratory Guide:

4. For the Outdoor Learners:

Anatomy Wonder No. 19 "Basics of a Body" Mobile

5. For the Table-Lab Crowd:

Anatomy Wonder No. 19 "Cells, Tissues, Organs, and Organ Systems Sort"

6. For the Crafts-and-Projects Families:

Anatomy Wonder No. 19 "My Body" Project

From the Student Notebook:

Complete Wonder No. 19 Entry

Please note that there are no lab worksheet pages for Wonders 19 - 36.

Optional Profile: Dr. Alexa Irene Canady

Profile: Dr. Alexa Irene Canady

In this profile, we celebrate Dr. Alexa Irene Canady, the first Black woman in the United States to become a neurosurgeon. She was born in Lansing, Michigan in 1950 and attended a school where she and her brother were the only Black children in attendance. Dr. Canady faced racial and gender discrimination from an early age, but she didn't let it stop her from pursuing a career in medicine. She was especially intrigued by the human brain, and chose to specialize in pediatric neurosurgery. She became the first African-American woman to be a board-certified Neurosurgeon in 1984, and the Chief of Neurosurgery at the Children's Hospital of Michigan in 1987. There, she treated countless children until her retirement. She continues to advocate for diversity in medicine, and to encourage young people to pursue careers in neurosurgery. She has received many awards and honors in her lifetime, including (but not limited to) her induction into the Michigan Women's Hall of Fame in 1989, and was awarded the Distinguished Service Award from Wayne State University Medical School in 1994.

Recommended Literature:

- page 55 in *Who Did It First?* by Julie Leung

Recommended Video Links:

From Eccentric Rebel, "28 Facts About Blacks || #13 - Alexa Irene Canady":

https://www.youtube.com/watch?v=20fj5T_C640

From American College of Surgeons, "Dr. Canady stresses the need to attract more young neurosurgeons": <https://www.youtube.com/watch?v=H9ujOlsExOw>

From Pixel Pirate Studio, "ALEXA CANADY History and Heritage Black History Month":

<https://www.youtube.com/watch?v=OENFGg6O0sQ>

From the Student Notebook:

Complete a profile page (located at the end of the notebook)

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For the Outdoor Learners:

"Basics of a Body" Mobile

What You'll Need:

- a large stick to use for a mobile
- yarn
- scissors
- card stock paper
- hole punch (optional)
- markers or crayons

What to Do:

1. In this activity, your child will make a hanging mobile of cells, tissues, organs, and organ systems. You may want to review the information in the parent guide or your chosen book(s) before beginning. You may wish to bring some of your books along for visual reference.

2. Find a stick to be the base of your mobile. Your child will make a picture of a cell, a picture of tissue, a picture of an organ, and a picture of an organ system or body system, all on sheets of card stock. This looks best if they make a picture on both sides of the paper, so the mobile looks nice no matter which way the papers turn or swing.

3. Once they've made their pictures, they will cut them out and use a hole punch (or scissors) to make a hole at the top and bottom of each picture. They will hang the pieces from the large stick, connecting each piece with string. They will hang the cell at the top, followed by tissue, then organ, then an organ or body system.

4. Hang their mobile up somewhere in your home.

For the Table-Lab Crowd

Cells, Tissues, Organs, and Organ Systems Sort

What You'll Need:

- the pictures on the next page, cut out
- scissors
- index cards
- markers
- your chosen book(s) for reference

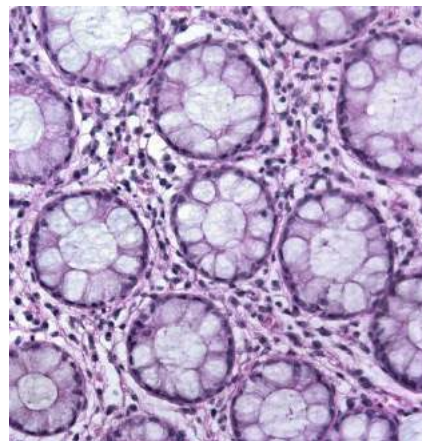
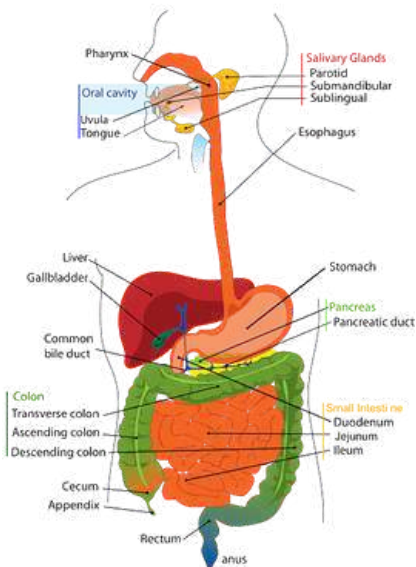
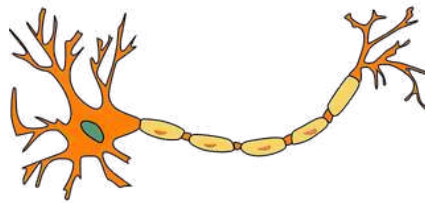
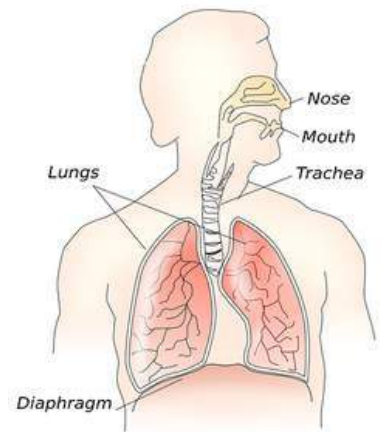
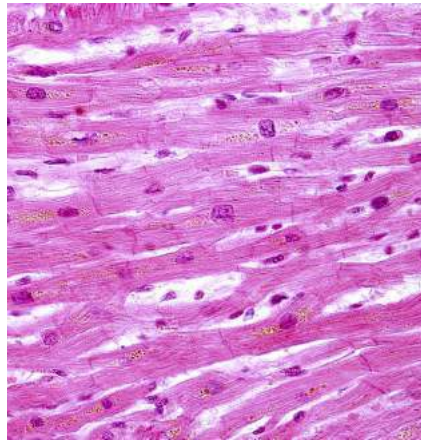
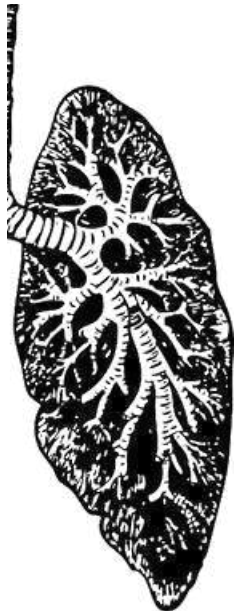
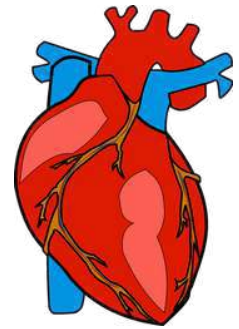
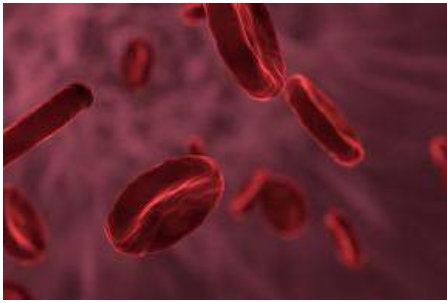
What to Do:

1. Cut out the pictures on the following page. You may wish to make a copy of them first, if needed.

2. Have your child label four index cards with the following: cell, tissue, organ, organ system.

3. Ask your child to spread the index card titles across a table. They will sort the pictures from the next page into the proper columns, under the proper index cards. Help your child as needed to identify each item and place it in the correct position. As they work, remind them about how cells group together to form tissue, tissue groups together to form organs, and organs work together in organ or body systems to carry out an important task.

Cells, Tissues, Organs, & Organ Systems Sort



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For the Crafts-and-Projects Families:

"My Body" Project

What You'll Need:

- *My Body* by Patricia Carratello, access to a copy machine and paper (optional) **OR** craft paper in several colors (if not using *My Body*)
- scissors
- markers, pencils, crayons
- paint in your child's skin color and brushes (optional)
- several pieces of poster board or foam core
- a large folder to store pieces in over several weeks
- tape and glue
- yarn in your child's hair color

What to Do:

1. This will be an on-going project in the "craft and project" category for weeks 19 - 36. Your child will spend these weeks putting a life-size anatomical model of their body together. You may use Patricia Carratello's book *My Body* if you would like each organ / part to be drawn for you, or you can help your child to make their own organs and parts out of craft paper each week. If you use *My Body*, you'll need to make copies of each organ onto sturdy paper, before having your child cut them out.

2. This week, prepare your body background. Trace your child's body on study paper (like poster board or foam core). It may require several sheets. Cut out the traced sections and tape them on the wall in a place where they can stay up for the next 18 wonders. Don't add anything else just yet, but assemble the basic supplies you'll need (listed above.)

3. You may also want to take some time this week to get a large manila envelope (or something similar) in which to store all of the body pieces as your child creates them over the coming weeks.



Optional Variation:

Instead of a "My Body" model made of paper, you can slowly assemble a "My Body" model made of craft felt, which you sew or glue onto a pair of long pants and a long-sleeved shirt at the end of the next 18 wonders. Simply follow the same prompts as the paper "My Body" model in Wonders 19 - 36, but make each part out of craft felt instead.

The Basics of a Body



Important Things to Know

Cells join together to form

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Tissues join together to form

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Organs join together (often
with tissues) to form

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