

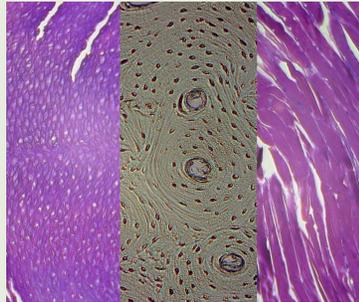
LESSON 6: What will see if we look at skin, bone, and muscle with the microscope, too?

PREVIOUS LESSON We noticed nerves in the cross section of the foot injury and wondered why they were present. We observed them using a microscope and noticed a unique structure. We read about nerve cells and learned that their function is enhanced by their structure. We engaged in activities to experience how nerves work, then considered how we can leverage what we know about nerves to understand healing.

THIS LESSON

INVESTIGATION

1 day



We recall how microscopes helped us investigate blood and nerves, so we think microscopes can also help us figure out what makes up skin, bone, and muscle. After predicting what we think we will see, we investigate pre-prepared slides of human skin, bone, and muscle. Then, we use our observational data to come to consensus around how cells' unique structures support their functions in the body.

NEXT LESSON We will develop a Gotta-Have-It Checklist to highlight what we figured out in Lessons 1–6. Students will take an individual assessment where they plan and carry out an investigation to determine if a mysterious object is similar to humans based on its microscopic structures and argue from evidence that other living things are similar to humans because they are made of cells.

BUILDING TOWARD NGSS

MS-LS1-1, MS-LS1-2, MS-LS1-3*,
MS-LS1-8*



WHAT STUDENTS WILL DO

6.A Analyze and interpret observational data in the microscopic structures of skin, bone, and muscle, relating those structures to the functions of those parts of the body.

WHAT STUDENTS WILL FIGURE OUT

- Bone, muscle, and skin have repeating patterns of microscopic structures called cells.
- The unique structures of the cells that make up these different parts of the body are related to their function:
 - Bone cells form ring-like patterns close together to provide structure and strength for the body.
 - Skin cells squish together and overlap one another to create a protective layer that keeps things in or out of the body.
 - Muscle cells are long and stringy so that they can stretch and contract, allowing the body to move.
- Many cells work together to form tissues in the body.
- Structure is the characteristic of something (the shape or way it's made or arranged) that supports its function.

Lesson 6 • Learning Plan Snapshot

Part	Duration	Summary	Slide	Materials
1	5 min	NAVIGATION Recall how microscopes have helped us investigate blood and nerves, and discuss how they could help us figure out what skin, bone, and muscle are made of. Predict what we think we'll see.	A-B	Parts of a Body poster
2	20 min	INVESTIGATE SKIN, BONE, AND MUSCLE WITH A MICROSCOPE After discussing the procedure with the class, students work in groups to investigate pre-prepared slides of human skin, bone, and muscle to see what these body parts are made of.	C-F	<i>Investigating Skin, Bone, and Muscle with a Microscope</i> , Investigate Skin, Bone, and Muscle with a Microscope
3	17 min	CONSENSUS DISCUSSION ABOUT STRUCTURE AND FUNCTION Students use their observational data to come to consensus around how cells' unique structures support their functions in the body.	G-I	<i>Investigating Skin, Bone, and Muscle with a Microscope</i> , Parts of a Body poster, markers, 3 sheets of blank 8.5x11 inch paper
4	8 min	UPDATE PROGRESS TRACKERS Reflect on and record what we figured out about cells and their structure/function relationship.	J	

End of day 1

Lesson 6 • Materials List

	per student	per group	per class
Investigate Skin, Bone, and Muscle with a Microscope materials		<ul style="list-style-type: none"> • microscope • pre-prepared slide of human skin • pre-prepared slide of human bone (compact) • pre-prepared slide of human muscle (striated) 	
Lesson materials	<ul style="list-style-type: none"> • science notebook • <i>Investigating Skin, Bone, and Muscle with a Microscope</i> 		<ul style="list-style-type: none"> • Parts of a Body poster • markers • 3 sheets of blank 8.5x11 inch paper

Materials preparation (30 minutes)

Review teacher guide, slides, and teacher references or keys (if applicable).

Make copies of handouts and ensure sufficient copies of student references, readings, and procedures are available.

In this lesson, students use microscopes to look at different samples on pre-prepared slides. The materials (slides, handouts, discussion prompts) all assume your microscopes have a 10x eyepiece lens and 4x, 10x, and 40x objective lenses. If the microscopes your class will be using are different, modify the materials accordingly or call students' attention to the differences.

If you do not have microscopes for your class to use, here are some options:

- A partner high school may have microscopes that you could borrow for this unit. Order the slides included in the unit materials list.
- We have included images of what students would see when zooming in on different body parts with the microscope in *Microscopic Images of Muscle, Bone, and Skin* and they can use these to make their observations.
- Access the Virtual Microscope interactive at <https://www.teachersopenscienciefieldtest.org/healing>. From there, copy the link for viewing **skin, bone, and muscle** and share it with your students so they can access it on their own devices. By sharing this direct link, your students will only have access to the images needed for this lesson.

Be sure you have materials (e.g., blank piece of paper, sticky note, or note card) to add the following words to the Word Wall: **cell, tissue, structure**. Do not post these word(s) until your class has developed a shared understanding of their meaning.

If students have concerns about using the human tissue samples on the prepared slides, you may use the micrograph images provided on *Microscopic Images of Muscle, Bone, and Skin* or access the Virtual Microscope interactive instead. However, you can also remind students that tissue samples like these came from people who willingly underwent a procedure called a biopsy to remove them for study. In a biopsy, doctors cut very thin and small slices of tissue from a patient and observe it under a microscope to try to discover the presence, cause, or extent of a disease. If there is still concern about using the micrographs, an illustration could be used instead, but the limitations of the illustration would need to be discussed.

Investigating Skin, Bone, and Muscle with a Microscope

- **Group size:** Divide your class by the number of microscopes available.
- **Setup:** Be sure all microscopes have access to an outlet (or other power source for their light).
- **Notes for during the lab:** Students should plug in the microscope. Have students sanitize microscopes between turns.
- **Safety:** Glass slides are fragile. Have ready an appropriate receptacle to dispose of broken glass as well as a broom and dustpan specifically reserved for cleanup of broken glass. Remind students to handle the slides carefully and ask you for help if one happens to break.
- **Disposal:** Keep all materials for future use.
- **Storage:** Unplug or turn off and cover microscopes when not in use to avoid dust.

Lesson 6 • Where We Are Going and NOT Going

Where We Are Going

In this lesson, students synthesize all the evidence they've been gathering from their microscope investigations. They will collect more data about the microscopic structures (cells) in the body, and relate the patterns they find to the function of those body parts. At the end of this lesson, students will have very general definitions of cells and tissues.

Where We Are NOT Going

While we will add “cells” to the Word Wall in this lesson, we will not be identifying or naming key parts until later lessons: Lesson 9 (nucleus) and Lesson 11 (cell membrane and cytoplasm).

The recommended slides for today's investigation (as well as the images provided on *Microscopic Images of Muscle, Bone, and Skin* and the Virtual Microscope interactive) are of compact bone (not cancellous or spongy) and skeletal muscle (not smooth or cardiac). However, the lesson does not include discussion of the different types of bone or muscle tissue, nor will this be investigated within this unit. The focus of the unit is not on discovering the different names and types of bones and muscles in the body; rather, focus on supporting students in figuring out that our bodies are made up of cells and that there are different types of cells depending on the function of the part of the body from which the cells originate.

LEARNING PLAN for LESSON 6

1 · NAVIGATION

5 min

MATERIALS: Parts of a Body poster

Navigate into today's work. Display **slide A**. Say, *We've been using microscopes to investigate some body parts. Who can remind us what the microscopes have helped us figure out about blood and nerves?*

Sample student responses include:

- *Blood is made of a mixture of a liquid called blood plasma and some very tiny structures called red blood cells, white blood cells, and platelets.*
- *Nerves are made of nerve cells that have branch-like arms that reach out and stretch to carry signals all over the body.*
- *The blood cells' shape also helps them do their job of travelling around the body - they're round so they can move easily through the blood vessels.*
- *The platelets have arm-like structures on them to do the job of sticking together when there's damage, and they need to plug a hole so blood doesn't keep leaking out.*

Refer back to the Parts of a Body poster. Say, *So we have figured out a little bit about how the blood and nerves look close up. We're trying to figure out how all of the parts of the body on this poster function, so we know what needs to heal and how it heals when an injury happens. We have figured out that there are smaller structures inside the blood and nerves that we can only see with a microscope, and those structures have shapes or characteristics that help them do their specific jobs. We've already determined what these other body parts do when they're working - we know the functions of the skin, bone, and muscle. How do you think looking at the skin, bones, and muscles closer up using microscopes might help us figure out how these different parts function and heal?*

Sample student responses include:

- *We can use the microscope to see what skin, bone, and muscle are made of.*
- *We could see if they also have smaller structures that we can only see close-up.*
- *We could see the structures that we think will need to heal to make the skin, bone, and muscle function again.*

ADDITIONAL GUIDANCE

If your students have already raised the idea of cells in general, or have suggested earlier in this unit that parts of the body (other than blood and nerves) are made of cells, they may bring that idea up again here: that microscopes could help us see what/if these other body parts are also made of cells.

Make predictions about what we might see with the microscopes. Display **slide B**. Direct students to turn and talk with a neighbor about these questions.

- *What do you think we will see when we look at muscle, skin, and bone with the microscope?*
- *Will it look like blood? Will it look like nerves? Will it look like something different? Why do you think so?*

After a moment of partner talk, ask students to share their ideas with the class. Accept all responses.

2 · INVESTIGATE SKIN, BONE, AND MUSCLE WITH A MICROSCOPE

20 min

MATERIALS: Investigate Skin, Bone, and Muscle with a Microscope, science notebook, *Investigating Skin, Bone, and Muscle with a Microscope*

Establish our investigation questions. Display slide C. Ask, *When we're investigating these samples of bone, skin, and muscle, what questions are we hoping to answer?*

Sample student responses include:

- *What are these body parts made of? Are there smaller structures in them?*
- *If we see structures, how do they relate to the function of these body parts?*

Distribute *Investigating Skin, Bone, and Muscle with a Microscope* and direct students to write these questions at the top of the page. Students can affix this page into their science notebooks now or after today's investigations.

Recall what we know about cross sections. Display slide D. Say, *We've used cross sections before to investigate parts inside of the body. Today, the samples of skin, bone, and muscle that we get to investigate are also cross sections. They're very, very thin slices of those body parts that have been stained and preserved on slides. They have to be so thin because anything we look at with a microscope has to let some light pass through to allow us to see if there are structures within it.*

ADDITIONAL GUIDANCE

You may want to tell students that tissue samples like these came from people who willingly underwent a procedure called a biopsy to remove them for study. In a biopsy, doctors cut very thin and small slices of tissue from a patient and observe it under a microscope to try to discover the presence, cause, or extent of a disease.

Review our procedure for looking at slides. Display slide E. Direct students to read the steps listed on the slide (also listed on *Investigating Skin, Bone, and Muscle with a Microscope*) to themselves.

Say, *We've had some practice now handling slides, adjusting the microscopes' focus and light, and changing objectives. Why is it helpful to observe a slide at all of the possible objectives before you decide which observation to record?*

Sample student responses include:

- *Sometimes we need a wider field of view - it's not helpful to be too close to see everything that's there.*
- *But sometimes we can see more detail at a higher magnification, looking closer.*
- *Different structures are different sizes, so we need to try all of our options before we decide which one works best for each sample.*

ALTERNATE ACTIVITY

If no microscopes are available, you have these options:

- Use the images provided on *Microscopic Images of Muscle, Bone, and Skin*.
- Access the Virtual Microscope interactive at <https://www.teachersopensciencedfieldtest.org/healing>. From there, copy the link for viewing **skin, bone, and muscle** and share it with your students so they can access it on their own devices. By sharing this direct link, your students will only have access to the images needed for this lesson.

Students can document their observations on *Investigating Skin, Bone, and Muscle with a Microscope* while using either of these materials.

Alternately, you could print consumable copies of *Microscopic Images of Muscle, Bone, and Skin*, and direct students to annotate the images with their thoughts about patterns and scales. If you choose to have students annotate images, it will likely take less time than if students are recording observations on the handout.

* ATTENDING TO EQUITY

Universal Design for Learning: In order to support students who might benefit from other options for *representation*, you may choose to print *Microscopic Images of Muscle, Bone, and Skin*, and direct them to annotate those images with ideas about how they compare to what students see in their microscopes and/or ideas about the patterns they notice in the structures they see across the samples.

Discuss our plans for recording data.* Display slide F, which shows the data table that's also on *Investigating Skin, Bone, and Muscle with a Microscope* and is shown below for your reference.

Sample being observed	Total magnification of the best view	Drawing of the whole field of view at the best magnification	Use words and/or drawings to describe any patterns you see
			
			
			

Say, Okay, so you see that the data table on your handout has space to record the magnification that you can find the best view - that means you're at a high enough magnification to closely see the structures that make up this tissue and you're able to focus clearly on them. We'll be comparing our data later, so why will it be important that you record the magnification at which you made your drawings?

Sample student responses include:

- *If we're looking for similarities and differences, we'll need to know if the structures are actually different or maybe they just look a bit different because we were viewing them at a different magnification than others.*

Say, Also, notice that this data table has space for you to record with drawings, both the whole field of view at the magnification you found the clearest view, and also to describe any patterns that you see. Why might we want to be looking for patterns here? How could noticing patterns help us find answers to our investigation questions?

Sample student responses include

- *Noticing patterns might help us figure out what structures these parts are made of, like when we saw a mixture of repeating circles in the blood.*
- *Noticing patterns might help us figure out how these structures may work together to help the body part function, like when we noticed the nerve branches stretching out, allowing signals to be passed throughout the body.*

Direct students to begin their observations. You might choose to flip back to slide E to display the investigation procedure. Circulate among groups to support students as they work.

ADDITIONAL GUIDANCE

Students will likely notice that the samples they're observing today have been stained, similar to the blood and nerves, and they may even notice similar colors among the different slides. But they will know that their skin doesn't look the same color as the sample on the slide. If they are confused by the colors they see on the slides, remind them about why samples are stained. Scientists and doctors use dye when looking at samples under the microscope so they can see different structures in a sample.

3 · CONSENSUS DISCUSSION ABOUT STRUCTURE AND FUNCTION

17 min

MATERIALS: science notebook, *Investigating Skin, Bone, and Muscle with a Microscope*, Parts of a Body poster, markers, 3 sheets of blank 8.5x11 inch paper

Bring the class together to share their data with a partner. Display **slide G**. Assign each student a partner to talk with who was not in their microscope group. Give students 2-3 minutes to discuss these questions, using their data to support their responses.

1. What similarities did you see (between the same body parts and across different ones)?
2. What differences did you see?
3. Do you think the structures you saw are related to the functions of those body parts? What makes you think that?

Lead a Consensus Discussion about structure and function. Display **slide H**. Gather the class in a Scientists Circle with their science notebooks and *Investigating Skin, Bone, and Muscle with a Microscope*. Use prompts, such as those that follow, to discuss with the whole class the microscopic structures we saw in these body parts.

Update the Parts of a Body poster during and/or after this discussion to summarize these ideas. A sample updated poster is shown after the discussion prompts.

During or after the discussion, ask for volunteers or choose students to make "zoomed in" drawings on 8.5x11 paper for bone, skin, and muscle to add to the classroom consensus model. Sample drawings are shown after the discussion prompts.

ADDITIONAL GUIDANCE

If you have a microscope that can be plugged into a computer, it may be helpful to project that while the class reports out what they found. This way students can come up to the screen and point out what they found or are referring to in their explanations.

KEY IDEAS

Purpose of this discussion: Students share the differences they observed in the bone, skin, and muscle cross sections. They name those structures cells (like the blood and nerves), but these are packed together (called tissue).

Listen for these ideas:

- There are small structures in each of these samples that we can only see with a microscope. These microscopic structures are called cells.
- Repeating patterns of cells working together form tissues in the body.
- Bone, muscle, and skin have repeating patterns of cells, but the structures of the cells and the repeating patterns they form are unique to each of those tissues.

* SUPPORTING STUDENTS IN DEVELOPING AND USING SCALE, PROPORTION, AND QUANTITY

This question requires students to think about the body parts at different spatial scales - they've zoomed in with the microscopes and now they have to think about what's happening in the larger body parts to consider how each structural unit contributes to the tissue structure and function within the body part.

You might choose to revisit the cross-sectional diagrams on *Close up of Skin, Muscle, and Bone* from Lesson 3 and notice with students that the artist may not have represented in these diagrams exactly what we actually see at the microscopic scale. The artist's purpose with the diagrams was to show what we cannot see from outside the body and the ways these structures are connected. Now that we've seen these structures with the microscope, we might appreciate how difficult it would be to illustrate those connections while trying to show the structures at a microscopic scale.

Suggested prompt	Sample student response
<i>What similarities did you notice when you compared what you saw in the muscle, skin, and bone cross sections?</i>	<i>Each of them was made of smaller structures that repeated themselves.</i>
<i>How were they different?</i>	<i>We can tell the pattern is made of smaller structures because we can see where each individual one is.</i>
<i>How do the structures that we saw today compare to those that we saw in the blood and nerves?</i>	<i>The structures had different shapes and different patterns in each sample.</i>
<i>What did we call those structures in the blood and nerves?</i>	<i>We saw patterns of tiny structures that repeated themselves in the blood and nerves, but they were spread out with distance between each of them. In the bone, skin, and muscle the structures are packed together.</i>
<i>Do you think we could also call these structures in the muscle, skin, and bone cells? Why or why not?</i>	<i>The structures we saw today were all right next to each other.</i>
<i>You said you noticed that the cells we saw today were packed closely together. In the body, multiple cells working together are called tissues. What tissues did we observe today?</i>	<i>We can still tell where the individual structures are, though, whether they're packed together or spread apart.</i>
Add "cells" to the Word Wall. Your definition might be something like "microscopic structures that make up different parts of our bodies." At this point, you might also choose to add cards for "red blood cells," "white blood cells," "nerve cells," "skin cells," "muscle cells," and "bone cells" as examples underneath the word "cells," or connect the definition of "cells" to the drawings of them on your classroom consensus model.	<p data-bbox="821 776 879 800"><i>Cells.</i></p> <p data-bbox="821 839 1312 863"><i>Yes! They are bone cells, skin cells, and muscle cells.</i></p> <p data-bbox="821 886 1486 943"><i>They're all tiny structures that we find in our body parts, but we need a microscope to see them.</i></p> <p data-bbox="821 966 1127 990"><i>They all help our body function.</i></p> <p data-bbox="821 1029 942 1053"><i>Bone tissue.</i></p> <p data-bbox="821 1076 932 1101"><i>Skin tissue.</i></p> <p data-bbox="821 1123 959 1148"><i>Muscle tissue.</i></p>

Cells: Microscopic structures that make up different parts of our bodies.

ADDITIONAL GUIDANCE

You may choose to take a moment and connect what we've figured out about cells to the nature of science: Science knowledge is cumulative and many people, from many generations and nations, have contributed to science knowledge. Cells were named by an English scientist named Robert Hooke, who observed them in 1665. He was familiar with monasteries - religious buildings that have small individual rooms called *cellula* for the monks who live there. See optional [slide 1](#) for images of monasteries so your students can connect those little rooms to the patterns of cells they've seen in their investigations. The Latin word *cella* ("small room," "storeroom," or "chamber") is related to the Latin word *celare* which means "to hide" or "conceal."

Add "tissue" to the Word Wall. Your definition might be something like "many cells working together to carry out a function in the body."

Continue the discussion. Say, *We wondered if the structures that make up the skin, bone, and muscle are related to their function. Do we have evidence to support that claim? To consider that, we're going to be thinking about the microscopic scale - what we just saw in these cross sections, and we also need to zoom back out and think about these parts at the scale we can see - our body parts.**

Tissue: many cells working together to carry out a function in the body.

Use prompts, such as those that follow, to support the class in finding consensus about how characteristics or structures of these cells, when arranged in a tissue, contribute to the function of the body part.

KEY IDEAS

Purpose of this discussion: Students come to consensus about how the shape and composition of the cells found in each tissue contribute to its function.

Listen for these ideas:

- The unique structures of these cells are related to their function (and that tissue's function) in the body:
 - Bone cells form regular circular rings close together to provide structure and strength for the body.
 - Skin cells squish together and overlap one another to create a protective layer that keeps things in or out of the body.
 - Muscle cells are long and stringy so that they can stretch and contract, allowing the body to move.

Suggested prompt

Let's remind ourselves - what did we say are the functions of these parts? Skin, bone, and muscle?

Sample student response

We said the skin protects the body - it keeps things out and keeps things in.

The job of the bones is to support our bodies - hold us up and with the muscles help us move.

Muscles' function is to stretch and move our bodies.

Suggested prompt	Sample student response
<p>OK, so let's think about each of these body parts and see if we have evidence for this claim that the cells' structure supports their function. If we start with the skin, for instance, how would you describe the pattern of skin cells you saw in that tissue?</p>	<p>The skin cells were very close together - like squished together and stacked on top of each other with no space between them.</p> <p>The shape looked a little like fish scales - kind of rounded, kind of jagged where the edges of one met another one.</p>
<p>So how does the structure of the skin cells support their function?</p>	<p>Skin's job is to cover the body and protect it - keep things out and keep things in. So having closely-packed kind of flat-looking cells that layer up on top of each other makes sure nothing gets into the body through the skin.</p>
<p>Does the structure of muscle cells support their function? What's your evidence?</p>	<p>Muscles stretch and move our bodies - they can stretch out and back like rubber bands, right? So, the muscle cells are long and stringy-looking (but all going the same direction, not like a pile of spaghetti).</p> <p>At really high magnification, I could see stripes or ridges or something on the stringy muscle cells - I wonder if those help them stretch out and come back, like a spring does.</p>
<p>Does the structure of bone cells relate to their function? Why do you think so?</p>	<p>Bones have to be really strong to support our bodies - that's their job. The patterns in the bone cells were circular, like the rings of a tree. That shape might help them be strong.</p>

Add "structure" to the Word Wall. Say something like, We've been using this word "structure" very often in these last few lessons, so it would be helpful to have it on our Word Wall. What exactly do we mean when we say "structure?"

Structure: the characteristic (the shape or way it's made or arranged) that supports its function.

Sample student responses include:

- Things or parts in the body, like the bones or the muscles
- Microscopic parts of the body, like white blood cells or skin cells
- The special parts of something that allow it to do its job, like the arms on the platelets or the branches on nerve cells are structures they have (that other cells don't)
- Structure can also be a characteristic or shape something has that helps it function, like the red blood cells' structure is round (they're shaped that way to travel through blood vessels)
- Sometimes the structure is how something is arranged to help it function, like how skin cells are layered up together to cover the body

Summarize your students' ideas into a definition of "structure" for the Word Wall, which could be something like, "the characteristic of something (the shape or way it's made or arranged) that supports its function."

SUPPORTING STUDENTS IN MAKING CONNECTIONS IN ELA

Students may mention how the word structure is used in other ways, such as:

- In ELA, we talk about text structure - the way an author organizes (or shapes or forms) their writing, like problem-solution or cause-effect.
- Buildings are called structures - we learned in ELA that "struct" means "to build."

If your students suggest these ideas, use them to help support a deeper understanding of the word, but keeping the focus on how it's used in science.

See example updated Parts of a Body poster here.

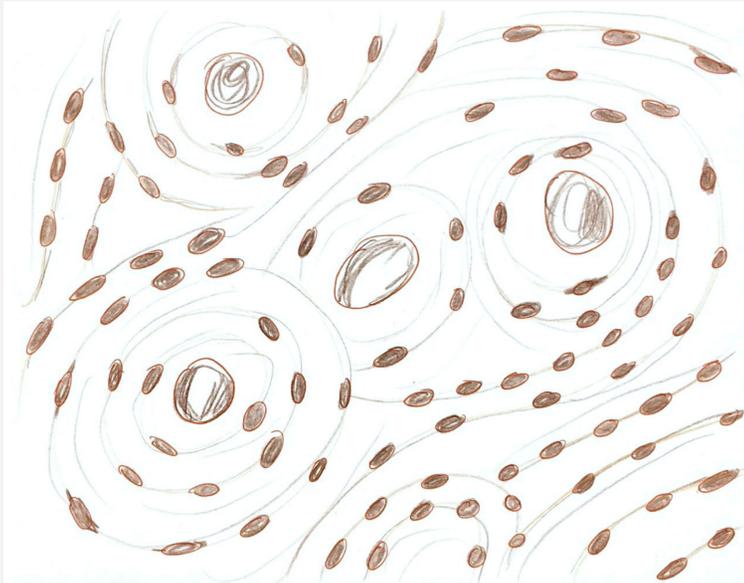
Parts of the ^a body		
structures	The job in the body (Function)	structure related to function
skin	It covers the muscles and bones. It protects the parts inside.	connected to muscle with a thin layer stretchy moves with parts its attached to closely packed flat looking cells
muscle	It contracts to move different parts of the body, like arms and legs. It is attached to the bones somehow.	stretchy contracts to move cells → long and stringy looking
bone	It gives the body structure and shape so it can stay up.	solid and hard attached to muscles somehow cells - arranged in circles
blood (also found in other structures)	<ul style="list-style-type: none"> Red blood cells carry oxygen from lungs around the body & carbon dioxide out of lungs. white blood cells help fight infection. Platelets help clog damaged parts to stop bleeding. plasma carries food, water, waste and nutrients around the body 	<p>The shape of the blood cells allow them to flow around the body.</p> <p>Blood is a mixture of things the body needs everywhere.</p>
nerves (also found in other structures)	• Nerves take in signals from our senses so we can see, smell, taste and feel things around us.	The branches or tentacles that spread out from each nerve cell allow them to branch out in the body and towards other nerve cells.

See example “zoom in” drawings here to add to the classroom consensus model.

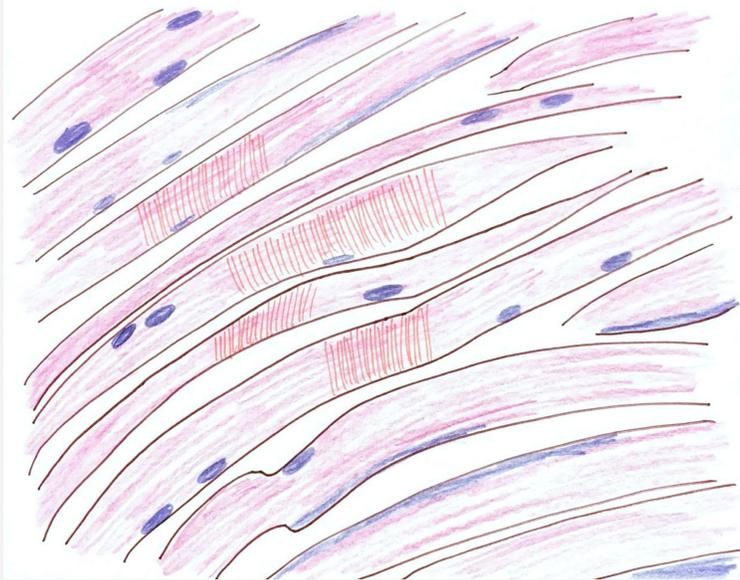
skin at high magnification



bone at medium magnification



muscle at medium magnification



4 · UPDATE PROGRESS TRACKERS

8 min

MATERIALS: science notebook



Update Progress Trackers in science notebooks. Display slide J. Direct students to the Progress Tracker section of their notebooks (landscape orientation) and have them add rows for what we've figured out about cells today. Remind students that this tracker is their space to process and record their thoughts while we're working to figure out how an injury can heal. (This a moment for formative assessment but not for scoring or grading.) Give students about 5 minutes to update their trackers. See the sample student responses shown below.

Question	What we figured out in words/pictures	This makes me think or wonder about healing...
<p>What will we see if we look at the skin, bone, and muscle with a microscope, too?</p>	<p>The parts of the body are made of cells, and those cells have different structures depending on their function in the body.</p> <ul style="list-style-type: none"> • Bone cells form ring-like patterns close together to provide structure and strength for the body. • Skin cells squish together and overlap one another to create a protective layer that keeps things in or out of the body. • Muscle cells are long and stringy so that they can stretch and contract, allowing the body to move. 	<p>I think those cells (or at least the patterns they form) get broken when a body part is injured.</p> <p>We know how the parts of the foot (a body) are structured and how that supports their function when they're not injured.</p>

ASSESSMENT OPPORTUNITY

Building towards: 6.A Analyze and interpret observational data in the microscopic structures of skin, bone, and muscle, relating those structures to the functions of those parts of the body.

What to look for: See the sample responses shown above.

What to do: When using the Progress Tracker as a formative assessment opportunity, recall that it should not be scored or graded. You are simply checking to see if your students were able to summarize the main take-aways from today's work and then directing your instruction accordingly. If students struggled to refer to patterns they saw in their investigation data to support their ideas about structures and functions, you may choose to have them use a copy of *Microscopic Images of Muscle, Bone, and Skin* and annotate it to highlight the repeating structures they see. Ask them to describe those structures and/or patterns in words. Then, refer back to the Parts of a Body poster and connect those descriptions to what the class figured out about the functions of the bones, skin, and muscles.

Conclude today's work and look ahead to next time. If any new questions have been raised today, be sure to add them to the Driving Question Board. Then say something like, *Now that we have figured out what the different parts of the foot system are made of when they're functioning correctly, next time let's go back to our timeline and capture what we have figured out there. Recording what we know about how these parts of the foot work can help us determine what more we need to know about what happens when a foot heals.*