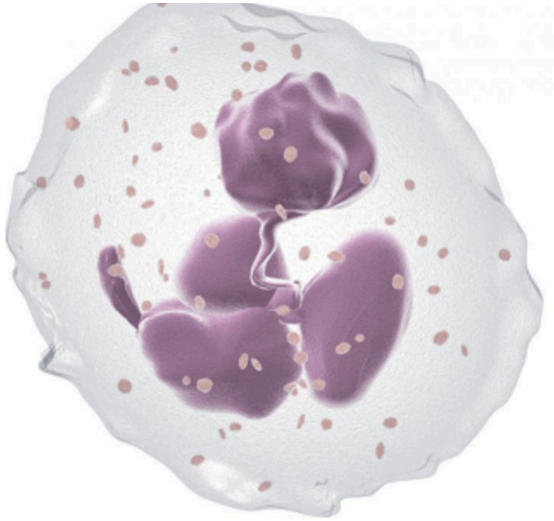
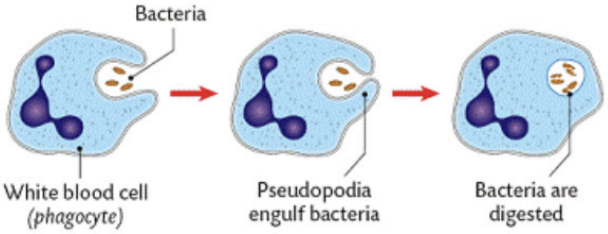
SCIENCE Biology Human Cells Human Anatomy	P-LS1-2. Plan and conduct an investigation to determine how familiar plants and/or animals use their external parts to help them survive in the environment. K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.	A. PRESENT: Human Cells 1. Start with the Introduction of the Microscope The Microscope is one of the most revolutionary pieces of equipment ever invented. It allows us to see inside ourselves and other living things understanding the basis for all biology. 2. When you think about it, we walk around all day without ever thinking about the 30 trillion cells that are working in our bodies to make our life possible. As an Educator, take them OUTSIDE. Have them stand and look at all the grass blades. They can feel and touch them and observe them as all small children like to do. Then, tell them that if all these blades of grass were cells in your body they would fit JUST IN YOUR BIG TOE! 3. You actually only have 17 trillion cells as a child which means you'll make 13 trillion more as you become an adult. 4. BACK IN THE CLASSROOM: Without saying a word, use building blocks to create a tall tower in the center of the circle while Learners quietly watch. Once the tower is complete, ask: "What would happen if I removed one of these blocks here at the bottom?" Pause for responses, and after pull a block out from the center/bottom to watch the tower come crashing down. Just like we use blocks to build a tower, our bodies make cells that are taking in information, building your heart and liver and your brain, and every

		other part of your body! Each and every cell is important and has a job to do, just like the blocks in our tower. Depending on your habits – learning a lot, eating well and practicing kindness – your cells will be programmed to be healthy and productive or unhealthy and *stagnant (define)*. What we have been talking about are human cells for building your body! This doesn't even count the trillions of bacteria cells that live in your body. These bacteria mostly keep you healthy. Can you believe all this is happening right now in your body? AND 330 billion cells are… replaced every day! Old cells die off like on your skin or hair and new ones are made without you doing a thing! 5. SCRAPE OFF a tiny bit of dry skin from your arm, add it to a slide and SHOW the Learners what skin CELLS look like under the microscope! Where do all those dead cells go? Some just fall off your body but others are *phagocytes* – from the Greek word "to eat". These are white blood cells that recycle old cells. They have little grains in them. They also are responsible for eating any bad bacteria that enter your system. Often when you are sick, a doctor will tell you that you have a high white blood cell count. That's because your body is making more phagocytes to fend off intruders.



phagocyte (a neutrophil)



		Cells have varying life cycles. Some of your white blood cells last only a few days, but the cells in the middle of your eye lenses will last your entire life. Neurons are the longest living cells – they make connections in your brain. Every time you learn something they store it and connect it to other things you've learned. There are also muscle neurons… it controls how your muscles function. Let's open and close our hands! Isn't this amazing! Without the muscle neuron memory, we would not remember how to do this, how to hold a pen, breathe, swallow or open your eyes! 6. Let's take a look at a few cells before we start our investigations. (Educators: purchase https://anatomywarehouse.com/animal-cell-anatomy-english-microscope-slides-a-100375?srsltid=AfmBOoolE22O7GZmzuHwSP-lLZSecGnakkbeTm9IM-h_t80mALCZUIXW This is an expensive set but can be used by the whole school. Please make sure to keep it in a dedicated storage area so it can be used year after year. You may purchase less expensive slides but they will not have the animal cell variety. Also make certain you have high-quality, lab-grade microscopes. (You will use this year after year.) Before we go any further, we are going to take the day to look at slides of different ANIMAL cells from the Kingdom Animalia. Animal cells are similar to human cells but not exact. Today, you'll each get time to look at all the slides. As young scientists, choose one slide that interests you. Then, use your colored pencils to draw what you see. 7. The Next Day: There are so many cells that you looked at yesterday.

		Which were your favorites? Can you share some things that you notice about the specific cells you were looking at through the microscope? What surprised you? B. PRESENT: Human Anatomy 1. Bring out a covered model of the human body or print one out in color. Keep it hidden under a cloth for dramatic effect. 2. Today, we're going to explore something amazing..Our bodies! Inside us are tiny things called cells as you already learned about — and they're doing their jobs all the time to help us live, move, and grow. The word "anatomy" means learning about all the different parts inside the body and how they work. 3. Lift the cloth slowly to reveal the body model or picture. Look at this! This is the human body, and it's made of parts — organs — that help us every day. We are going to learn about these important parts: a. Brain b. Heart c. Lungs d. Stomach e. Liver f. Intestines 4. Let's take each one out, name it, and make a label in cursive. As you take out each organ (or point to it), write its name on a card in cursive and place it in a line. 5. Now... shall we name our body? John? Jane? Something silly? We'll leave

		them resting for now while we learn more! 6. Follow up: Choose one body part from the ones we looked at. If someone already picked your favorite, you can pick another part of the body — like skin, hair, teeth, bones, or even your eyes. 7. LEARNER WORK: In the Atelier, using clay, paper, or drawing, you'll: a. Draw or make the body part you picked. b. What does your body part do? Tell us how it helps your body every day. c. What can go wrong? (Does it get sick? Hurt? How do we keep it healthy?) d. You'll have a few days to work on this. When everyone is ready, we'll share our work and put our body model back together again.