Learning Objective: Describe and explain the organelles that make up a human cell. Understand the shapes of organelles. Compare and contrast the parts of a cell to the human body, a factory, and/or a mobile device like a phone.

Curriculum:

The cell is the smallest structural unit of living organisms and is the thing that keeps us functioning and alive! We are made of 30 trillion cells! Like the human body, the cell has “organs” called organelles. In this model, students can interact with a physical model of the cell with organelles included.

Lesson Plan:

This lesson needs a sighted guide to hand the organelles to the students.

Read the curriculum out loud so that students get some context.

Teacher hands the nucleus to the students. Students should pass the organelle along, so everyone has the chance to feel the nucleus.

Tell students to describe what they feel and what they think the organelle might do.

If there is string, rubber bands, or anything long and thin, pass it around and have students place it inside the nucleus

 Go to the description and read the description for a nucleus

Ask, “what was the piece of (object used as DNA) you just dropped in”?

Ask for questions!

Repeat steps 3, 4, 6, 8 for every organelle.

Try to have every student try to put the organelles into the cell. If it’s too difficult, help them out and describe the relative position of each organelle to the students.

Ask them, “what do you notice about the positions of the organelles?

Tell students to answer the learning objective.

Analogy activity (for after the students learn the basics of a cell):

Ask students, “What are you made of? What parts of your body helps you function? Think inside the body.”

If students don’t mention organ/s: Reveal that everything you all said was correct. Say, “we are also made of organs”.

Organs make up the human body just as organelles make up \_\_\_\_\_\_\_\_. (the cell)

Bring out the cell model again and hand one organelle out at a time.

Ask students to compare the organelle with an organ in the human body.

Repeat steps 3 and 4 for the other organelles.

Ask students, “Can you make any more comparisons that connect cells to something else”?

Have students explain the comparison.

Game time!

Make sure everyone is familiar with the organelles, especially how they feel and their relative size to other organelles.

If some students are still having trouble, describe it for them. For example, you can say, “the rough er is really big and has bumps while the smooth er is smooth and small.”

Read out the instructions for the game:

Materials: a stopwatch, cell model with organelles, and pencil and paper. One person will call out the organelle’s name and another person has to pick up the right organelle. Repeat for all organelles and record the time once the person finishes identifying all the organelles.

For each student, a student should have the cell model with all its organelles.

Teacher has a pen, pencil, and stopwatch ready.

Teacher calls out the organelles, once the student identifies them (doesn’t have to be correct), move onto the next organelle.

Repeat for the other students

Gather times and scores for all students.

Student with the highest score and lowest time is the winner.

Organelle Descriptions

Nucleus: The nucleus of the cell houses the DNA, or genetic information, that controls everything that goes on inside the cell. It controls everything by controlling the making of proteins or protein synthesis.

Cell membrane: The cell membrane is like the skin of the human body and is made of phospholipid bilayers, which are the bumps on the surface of the cell. The spherical heads of the phospholipids are also called phosphate heads. They point towards the outside because they are hydrophilic or water loving. On the other hand, the straight lines are the fatty acid tails, which are hydrophobic or water fearing. The membrane surrounds the entire cell and regulates what comes in and out of the cell.

Rough endoplasmic reticulum (rough er): This organelle got its name from the ribosomes on the surface on the organelle, making it rough. Ribosomes on the rough er help the organelle make proteins for export.

Smooth endoplasmic reticulum (smooth er): This organelle is smooth because it doesn’t have any ribosomes on it and is connected with the rough er. Its main function is to make lipids for the cell, which the cell can use for the membrane.

Golgi Complex: This organelle works hand in hand with the rough er to make proteins for export. Once the proteins are made, the golgi will modify and package it for exporting.

Mitochondria: Often called the powerhouse of the cell, this organelle makes the energy or ATP for the cell through a process called cellular respiration.

Centrosomes/Centrioles: Two centrioles make up one centrosome. Centrioles are essential for moving contents inside the cell around. For example, during cell division, centrioles pull chromosomes apart to opposite sides.

Ribosomes: Ribosomes make proteins for the cell to use or for export outside of the cell. They are the bumps on the rough er.