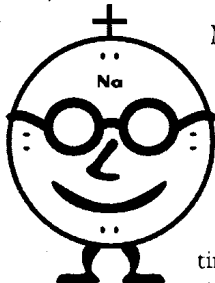


### Activity 3: How is a Cell Like School?

#### Reading Selection: How is a Cell Like School?

Every day when you get to school, you see the same building. You probably enter through the same door, walk through the same hallways, and sit in the same classroom. Some days this routine may seem boring. I'd like to tell you some interesting things about my day. It might make you think about your school, and your body's cells, in a whole different way.

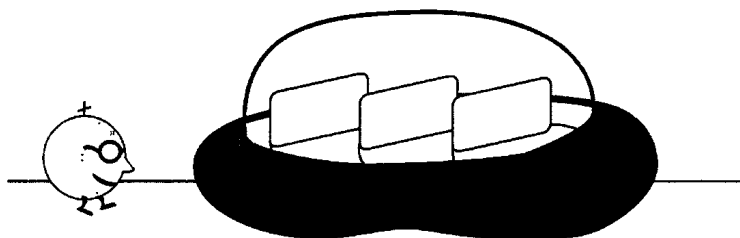
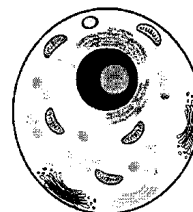


My name is Sodi M. Ion. I spend my days inside your body, being transported into and out of your cells and wandering around their different parts, or organelles. Does this sound at all like your day at school yet? Come, let me show you.

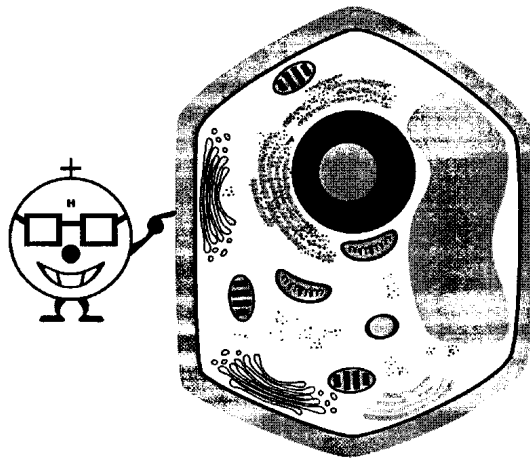
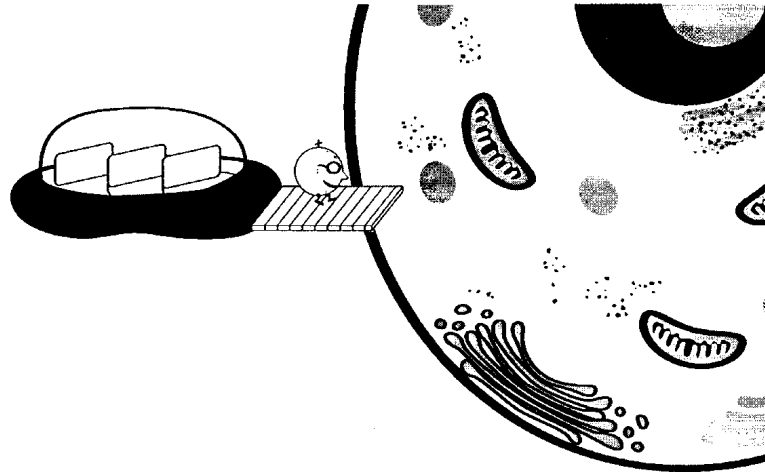
First, we have to wait for the transport protein to pick us up. It always takes longer than I want it to. When I have to wait a long time for the transport protein to come, I get impatient and think about how I could have rested a little longer. Do you ever feel that way while waiting for your ride to school?

Hooray, here it comes! I hope Pat Tassium isn't riding with us today. He tells goofy jokes and butts into my conversations with Chlora Inn, one of my best friends. Come on, let's go.

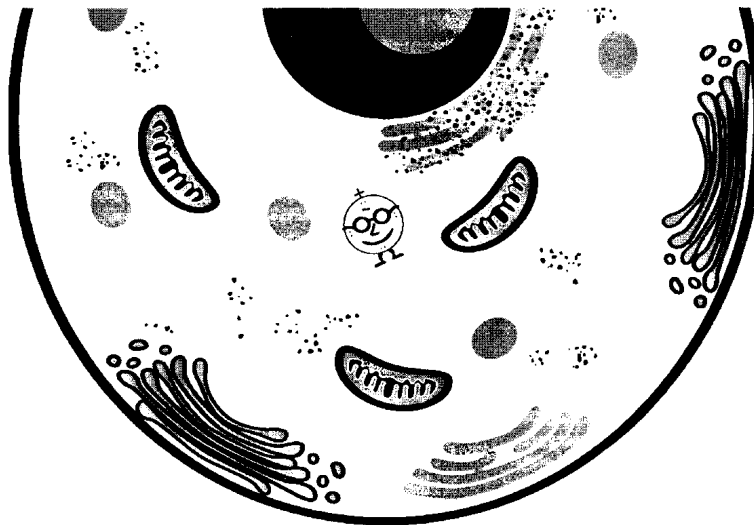
We're in luck. We have this transport all to ourselves. This will be a short trip. We are just going to visit that cell over there. Usually, I deliver energy food to the cell, something like water or glucose, but today, I'll just show you around.



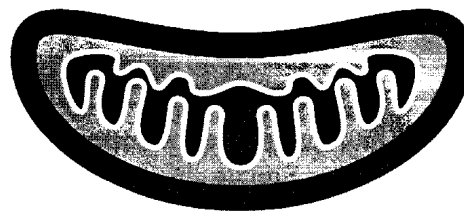
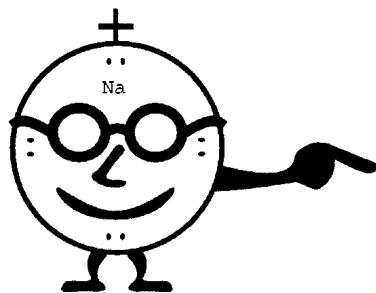
The transport will pull up beside the cell membrane and allow us to go right in. The cell membrane is the outside of the cell. It surrounds the cell and holds everything together. It lets in the things that need to get in, and keeps other things out. The cell membrane is similar to the walls of your school. The walls support the building. People and supplies can come and go through the doors, but wind and rain and wild animals are kept out by the walls.



Speaking of walls, my cousin Hy Drogen, who lives in a tree, recently told me that plant cells have an extra layer of protection outside the cell membrane. He called it the cell wall. Hy said the cell wall is a strong structure that adds support to the plant cell. He also mentioned that the plant cells that he visits are kind of box-shaped, because of this cell wall. Plant cells are different from the round, squishy animal cell that we're in, inside your body.

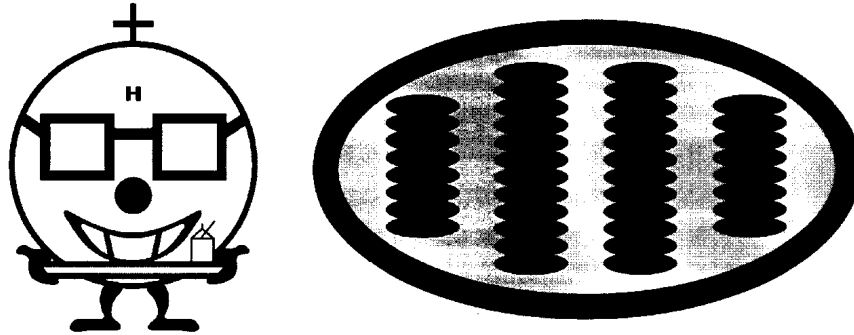


You may have a hard time moving around inside the cell because of the cytoplasm. Cytoplasm is a thick fluid that fills the cell. All of the cell parts float around in this stuff. To them, it's the normal environment, like air in your schoolroom. Can you float through the cytoplasm along with me? That's great! You're a natural at floating through the cytoplasm.



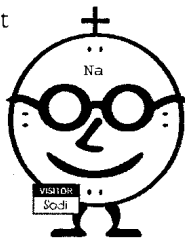
Hey, look over here. Do you see this bean-shaped object? It is an organelle called a mitochondrion. Do you remember when I said that I sometimes bring food into the cell? Well, when I help glucose get into the cell, it goes to a mitochondrion. Mitochondria are the power plants, or energy sources for the cell. They take glucose and convert it to energy to run cell processes, similar to the way that the furnace in your school converts gas or oil into heat. You will see a lot of mitochondria around, because it takes a lot of energy to keep a cell operating.

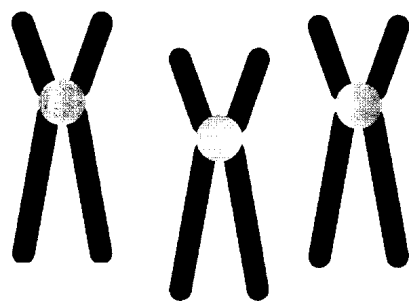
Do plant cells have mitochondria? Yes, they do. But they also have something that animal cells don't have. My cousin Hy said that many plant cells make their own food in organelles called chloroplasts. The chloroplasts make food, and the mitochondria use it, sort of how your school cafeteria makes food and you use it. Have you ever wondered why so many plants are green? Chloroplasts are green and they give plant cells their green color.



We should check in at command central before we go any farther. Command central is what I call the nucleus, one of the largest organelles. The nucleus gives instructions to the cell parts and controls the activities of the cell. Think of the nucleus as the main office or principal's office at your school. Directions for what happens at school come from that place. It is also where visitors check in before going to different areas of the school. Once we sign in and get our passes, we will be able to visit the other areas of the cell.

Here's your pass. Keep it with you during this tour. Before we leave, though, let me show you some very important parts of the nucleus...

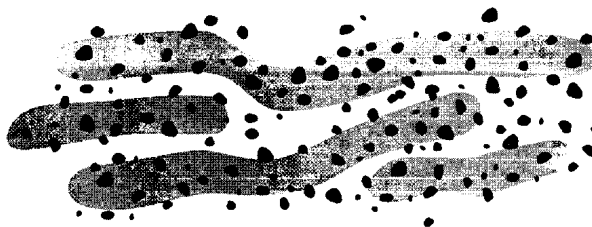




the chromosomes! They are made of DNA that contains all of the information about the cell and the organism to which the cell belongs. The information code in DNA makes chromosomes similar to the filing cabinets in your school's main office. Those files contain information about the staff and students at the school and information about how the school operates. Well, the DNA in these chromosomes contains information about the organelles of the cell and how they should operate. Got it? OK. Let's go.



When the nucleus wants to send instructions to an organelle, DNA in one of the chromosomes sends the instructions through a passageway like this one. This is called the endoplasmic reticulum and it functions like the hallways in your school.

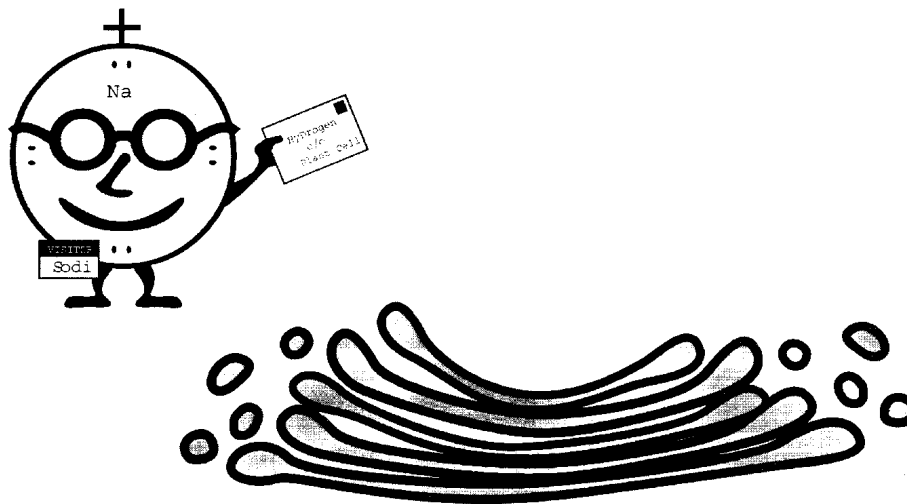


Not every passageway, and not every endoplasmic reticulum, looks the same. Notice the bumps on this endoplasmic reticulum. Those bumps are ribosomes. Ribosomes are areas where the messages sent from DNA are followed to create proteins. Think of the proteins as information packages. Proteins travel from ribosomes to certain places in the cell. They help perform specific jobs or deliver instructions. When endoplasmic reticulum has ribosomes on it, like this, it is called rough endoplasmic reticulum.

There is also smooth endoplasmic reticulum, which lacks ribosomes. It is mainly just a passageway for molecules or ions like me to travel.

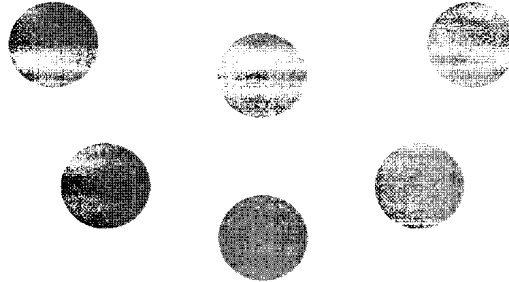


Sometimes the proteins created inside the cell, or other molecules in the cell, need to be shipped out to other cells. Material that is to be sent out of the cell is packaged in this area, called a Golgi apparatus. You're right! That is a weird name. Think of a Golgi apparatus as a mailroom or post office. You may not have a post office in your school, but there is probably a mailbox or a mailroom where outgoing packages are prepared. Maybe you could get your principal to call it the Golgi box. It sounds like a catchy name to me. Well, maybe not.

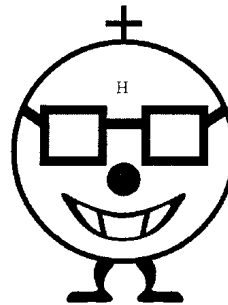




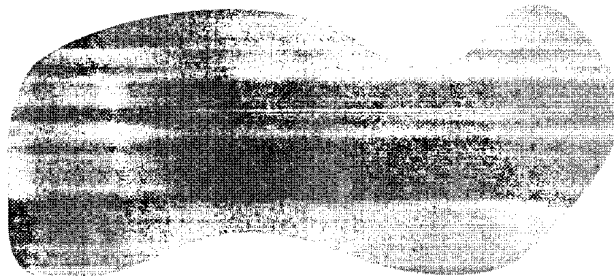
Our tour of this cell is almost finished. There are just a few other parts that I want to show you, like these small, round vacuoles floating here. Vacuoles can do several different jobs. Sometimes, they help carry things into and out of the cell, like a mail delivery person who brings letters and packages to and from your school.



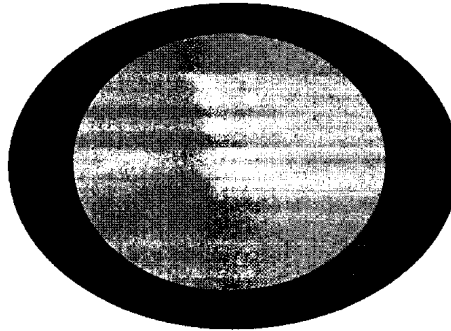
Other vacuoles store molecules, like a closet in your school or your closet at home. You may not need the stuff in there right now, but when you need it later, you will know where to find it.



Cousin Hy tells me that plant cells contain one large vacuole instead of many smaller ones. He says that a plant vacuole takes up a lot of space and helps the plant cell keep its boxy shape. This is another difference between plant cells and animal cells.



The last organelle I want you to see before we leave is called a lysosome. Think of it as the cell's trash can. The lysosome is a round organelle that gets rid of old, worn-out parts that are in the cell. In fact, when a whole cell is old and worn out, lysosomes help take it apart to make way for new cells.



Here we are, back at the cell membrane, ready for the transport protein to come back and pick us up. You have to go, and I have to deliver food and water to some other cells. I enjoyed showing you around. Next time you think that school is getting boring, just think about me and all the amazing things that are happening in each one of the cells in your body. That should liven things up! I hope you will visit again soon. If you come back, we can spend some time in the nucleus, looking at the DNA codes.

Goodbye!

