

Cells Study Guide #2

- **“An object is the sum of its parts.”**
 - Sum = addition
 - A bicycle is made of all of its parts: wheels, tires, seat, handlebars, chain, spokes.
 - A plant or animal is made up of all of its cells.
 - A plant or animal cell is made up of all of its parts also.
- **A microscope** is used to see things that are very, very tiny.
 - These things are so tiny that they can't be seen with the “naked eye.”
- **Plant cells have:**
 - Cytoplasm, a nucleus, a membrane and cell wall, and chloroplast, and organelles.
- **Animal cells have:**
 - Cytoplasm, a nucleus, a membrane, and organelles.
- **Organelles**
 - Both plant and animal cells have organelles.
 - Organelles are the things inside a cell, such as a nucleus. There are many organelles besides those listed below.
 - The **nucleus** is the “control center” of the cell. It tells all of the other organelles what to do and when to do it.
 - The **cytoplasm** is a jelly-like substance inside the membrane. All of the organelles float in the cytoplasm.
 - Both plant and animal cells have a **membrane**. It holds the cell together.
 - Membranes are thin enough that animal cells can move.
 - Only plant cells have **cell walls**. Cell walls are thick and sturdy so plant cells do not move like animal cells.
 - A plant cell has **chloroplasts**.
 - Chloroplast is green and makes food for the cell through photosynthesis.
 - A **vacuole** is like a little room in a cell. Whatever a cell needs to store, like food, goes into the vacuole.
 - Animal cell vacuoles are small.
 - Plant cell vacuoles are very big.
- **Microorganisms and Microbes**
 - A microorganism is any living thing that is so small that you need a microscope to see it.
 - A microbe is another name for a microorganism.
- **Beneficial Microorganisms**
 - The word *beneficial* means to be helpful, or good.
 - Yeast is a microorganism that helps bread to rise.
 - Microorganisms, like bacteria, are in our digestive system.
 - They help us get nutrients from our food.
 - Fungi is a microorganism. It decomposes dead things.
 - If it didn't do this, then dead things would never rot away.
 - Some bacteria are needed to make food, such as yogurt and cheese.
 - Protozoas are very tiny microorganisms. They are helpful by providing food for other microorganisms and animals.
- **Harmful Microorganisms**
 - Some microorganisms are not helpful. Instead, they are harmful.
 - Decomposers and fungi are needed to break apart dead things. But sometimes they make our food rot, too.
 - Bacteria are both helpful and harmful.
 - Harmful bacteria can cause illnesses and keep sores from healing.
 - Food poisoning is caused by bad bacteria.
 - Protozoas are another kind of harmful microorganism.
 - Protozoas cause illnesses, such as malaria and sleeping sickness.
 - Harmful microorganisms are also called “germs!”
 - Germs include: Bacteria, virus, fungi, and protozoas.
- **Viruses**
 - Scientists still debate whether a virus is alive or not.
 - Viruses are not complete cells.
 - Viruses cause illness such as the cold, the flu, chicken pox, and cold sores.
 - Scientists say that viruses should not be thought of as a microorganism, or microbe, because it is not alive.
 - Even so, a virus is so small that it can't be seen without a microscope!
- **Protists**
 - A protist is a microorganism that is neither a plant nor an animal. It is just something different, but it is alive!
 - Some protists have only one cell, but others have many cells.
 - Some protists can cause illness to animals and plants.
 - Some protists get their energy from the sun.
 - Others get their energy from other microorganisms.
- **Cells Work Together**
 - There are many types of cells. They come in many shapes and have many different jobs to do.
 - Some cells “work together” to do the same kind of job.
 - When cells work together and are all the same type, they are called *tissues*.
 - Nerve cells that “work together” become the brain and spinal cord.
 - Plants have tissues, too, such as the “tubes” that run up the plant to move water from the roots to the leaves.
 - When different tissues “work together,” they become an *organ*.
 - Organs include the lungs, heart, skin, and stomach.