**Directions**: You will navigate through this online webquest and complete this packet. Use the up and down arrows to move from page to page and click on underlined weblinks to take you to the appropriate websites.

## Prokaryote vs. Eukaryote

Use this [lwebsite](https://www.technologynetworks.com/cell-science/articles/prokaryotes-vs-eukaryotes-what-are-the-key-differences-336095) to find the necessary information. Please provide 3 cell features, 2 examples and 1 photo of a prokaryote and eukaryote.

**Prokaryotes** are unicellular organisms, found in all environments. Prokaryotes are the largest group of organisms, mostly due to the vast array of bacteria, which make up most of the prokaryote classification.

**3 Cell features:**

**2 Examples:**

**1 Picture:**

**Eukaryotes** are generally more advanced than prokaryotes. There are many unicellular organisms which are eukaryotic, but all cells in multi-cellular organisms are eukaryotic.

**3 Cell features:**

**2 Examples:**

**1 Picture:**

# The Virtual Cell

Organelles are structures or parts within the cell. Complete the following questions and provide a picture on each of the organelles using the website of the [**Virtual Cell**.](https://www.ibiblio.org/virtualcell/tour/cell/cell.htm)  You can and should click on the organelles to get more information on each. Use the blue arrows (ON THE LEFT) to read more about each organelle after you have clicked on it.

1. **Nucleus** is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the cell. It is a large dark spot in eukaryotic cells. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ all cell activity. The nuclear membrane has many pores. The thick ropy strands are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The large solid spot is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. The nucleolus is a knot of chromatin. It manufactures ribosomes. The chromatin is \_\_\_\_\_\_\_\_\_\_ in its active form. It is a combination of DNA and histone proteins. It stores the information needed for the manufacture of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Draw a picture of the nucleus and its nucleolus.
2. **Mitochondria** is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the cell. It is the site of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It has a \_\_\_\_\_\_\_\_\_\_\_\_ membrane. The white folded inner membrane is where most aerobic respiration occurs. The inner membrane is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with a very large surface area. These ruffles are called cristae. Mitochondria have their own \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and manufacture some of their own proteins. Draw a picture of the mitochondria.
3. **Rough Endoplasmic Reticulum (ER)** is a series of double membranes that \_\_\_\_\_\_\_\_\_\_\_\_\_ back and forth between the cell membrane and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. These membranes fill the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but you cannot see them because they are very transparent (see through). The rough ER has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ attached to it. This gives it texture. These ribosomes manufacture \_\_\_\_\_\_\_\_\_\_\_\_\_ for the cell. The ribosomes are the organelles which manufacture proteins. Draw a picture of the rough ER with ribosomes.

1. **Smooth ER** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ribosome’s. It acts as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ throughout the cytoplasm. It runs from the cell membrane to the nuclear membrane and throughout the rest of the cell. It also produces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the cell. Draw a picture of the smooth ER.
2. **Cell Membrane** performs a number of critical functions for the \_\_\_\_\_\_\_\_\_\_. It regulates all that \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and leaves the cell; in multicellular organisms it allows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ recognition. Draw and shade the cell membrane.
3. **Golgi Body** is responsible for packaging \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the cell. Once the proteins are produces by the \_\_\_\_\_\_\_\_\_\_\_\_ E.R., they pass into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ like cisternae (stacks) that are the main part of the Golgi body. These proteins are then squeezed off into the little \_\_\_\_\_\_\_\_\_\_\_ which drift off into the cytoplasm. Draw a picture of the Golgi Body.
4. **Chloroplasts** are the site of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Chloroplasts are only in plant cells. They consist of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ membrane. The stacks of disk like structures are called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The membranes connecting them are the thylakoid membranes. Draw a picture of the chloroplasts.
5. **Lysosomes** are called \_\_\_\_\_\_\_\_\_\_\_\_\_ stacks. They are produced by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ body. They consist of a single membrane surrounding powerful \_\_\_\_\_\_\_\_\_\_\_\_\_\_ enzymes. Those lumpy brown structures are digestive enzymes. They help protect you by \_\_\_\_\_\_\_\_\_\_\_\_\_ the bacteria that your white blood cells engulf. Lysosomes act as a clean up crew for the cell. Draw a picture of the lysosome.
6. **Centrioles** are found only in \_\_\_\_\_\_\_\_\_\_\_\_\_ cells. They function in cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They have \_\_\_\_\_\_\_\_\_ groups of \_\_\_\_\_\_\_\_\_ arrangements of the protein fibers. Draw a picture of the centrioles.

**Plant vs. Animal cells**

Complete the Venn Diagram comparing plant and animal cells below using this [YouTube video](https://youtu.be/ApvxVtBJxd0)

PLANT ANIMAL

