Student Exploration: Cell Structure

**Vocabulary:** cell membrane, cell wall, centriole, chloroplast, cytoplasm, endoplasmic reticulum, Golgi apparatus, lysosome, mitochondria, nuclear membrane, nucleolus, nucleus, organelle, plastid, ribosome, vacuole, vesicle

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

1. What are some of the structures inside a cell that help it to live and perform its role in an organism? _____________________________________________________________
   ______________________________________________________________________

2. How do you think plant cells differ from animal cells? (Hint: What can plants do that animals cannot?) ______________________________________________________________________
   ______________________________________________________________________

**Gizmo Warm-up**

The Cell Structure Gizmo™ allows you to look at typical animal and plant cells under a microscope. On the ANIMAL CELL tab, click Sample to take a sample of an animal cell. Use the Zoom slider to see the cell at a magnification of 2000x (2000 times larger than normal). On the dropdown menu, select Centrioles.

1. Use the up/down and left/right sliders to manipulate the cell. Find the red arrow pointing to the centrioles. Make a sketch of the centrioles in the space below.

2. Read the description of the centrioles. What is their function? __________________________
   __________________________________________________________________________
   __________________________________________________________________________
Activity A: Animal cells

Get the Gizmo ready:
- Check that an Animal cell is mounted on the microscope.
- Check that the Zoom is set to 2000x.

Question: Organelles are specialized structures that perform various functions in the cell. What are the functions of the organelles in an animal cell?

1. **Label**: Locate each organelle in the animal cell. Label the organelles in the diagram below.

2. **Match**: Read about each organelle. Then match each organelle to its function/description.

   - **Cytoplasm**
   - **Lysosome**
   - **Mitochondria**
   - **Centriole**
   - **Endoplasmic reticulum**
   - **Vacuole**
   - **Cell membrane**
   - **Nucleus**
   - **Ribosome**
   - **Nuclear membrane**
   - **Golgi apparatus**
   - **Vesicle**
   - **Nucleolus**

   - A. Structure that organizes motion of chromosomes.
   - B. Stack of membranes that packages chemicals.
   - C. Membrane that protects the nucleus.
   - D. Membrane that surrounds and protects the cell.
   - E. Sac filled with digestive chemicals.
   - F. Structures that converts nutrients to energy.
   - G. Passageways where chemicals are made.
   - H. Jelly-like substance within the plasma membrane.
   - I. Structure that manufactures ribosomes.
   - J. Structure that contains DNA and directs the cell.
   - K. Package created by the Golgi apparatus.
   - L. Small structure that synthesizes proteins.
   - M. Sac that stores water, nutrients, or waste products.
Activity B: Plant cells

Get the Gizmo ready:
- Select the PLANT CELL tab, and click Sample.
- Set the Zoom to 2000x.

Question: What functions do the organelles in a plant cell perform?

1. **Label**: Locate each organelle in the plant cell. Label the organelles in the diagram below.

![Plant cell diagram]

2. **Compare**: What structures are present in an animal cell, but not in a plant cell? __________
   __________________________________________________________________________

   What structures are present in a plant cell, but not in an animal cell? __________
   __________________________________________________________________________

3. **Fill in**: Name the organelle or organelles that perform each of the following functions.
   
   A. __________________________ convert sunlight to chemical energy.
   
   B. The ______________________ and the ______________________ help to support
      the plant cell and help it to maintain its shape.
   
   C. ______________________ store food or pigments.
   
   D. The ______________________ converts food into energy. It is found in both plant
      cells and animal cells.