

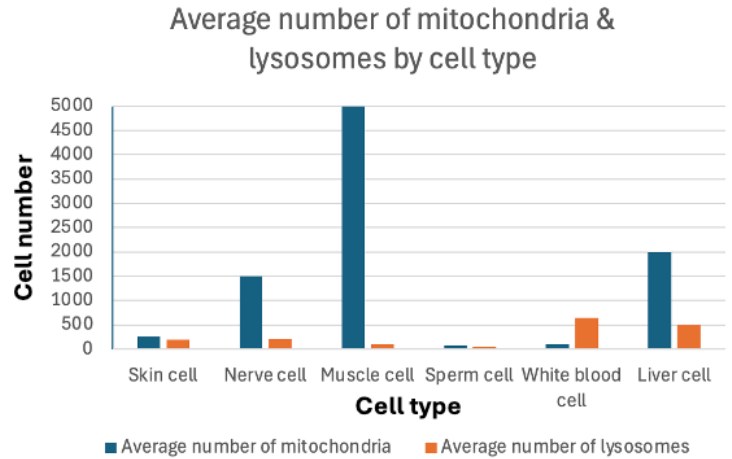
Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Weekly Graphing and Data Practice: Organelles by Cell Type

## Background

Cells have different organelles each specialized to do specific jobs to keep the cell functioning. For example, mitochondria are often called the “powerhouses” of the cell because they produce most of the cell’s energy through a process called cellular respiration. Lysosomes serve as the cell’s “clean-up crew”, breaking down and recycling foreign and waste material in the cell. Different cell types in the human body—such as muscle cells, nerve cells, and skin cells—have different structures and functions, which means they have different needs. As a result, the number of organelles in a cell can vary widely. Scientists measure organelle numbers in cells to better understand how cells function and how changes in organelle numbers can affect health and disease.



## Experimental Design

1. What is the independent variable in this experiment? \_\_\_\_\_
2. What is the dependent variable in this experiment? \_\_\_\_\_

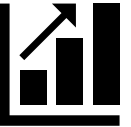
Write a hypothesis about the relationship between cell type and number of each organelle:

\_\_\_\_\_

\_\_\_\_\_

## Data interpretation

3. What is the average number of mitochondria found in a liver cell? \_\_\_\_\_
4. What is the average number of lysosomes found in a skin cell? \_\_\_\_\_
5. Which cell type has the highest number of mitochondria? \_\_\_\_\_
6. Which cell type most likely has the highest energy needs? Support your answer with evidence from the graph and reasoning.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

7. Write a **CER** summarizing the results of this experiment, using evidence from the graph to support your claim(s) and explaining with reasoning.

**Application (CER WRITING)**

Cancer is a disease of abnormal and excessive cell growth. As cancer cells grow unregulated, they have vastly increased energy needs.

8. Based on this information, how do you think the number of mitochondria and/or lysosomes in cancer cells may differ from normal and healthy cells? **Support your answer with reasoning.**

9. The table on the right shows three biopsy samples from the liver in a patient with a suspected cancer diagnosis. Does this patient have cancer? If so, which biopsy sample(s) most likely contains cancer cells? **Support your answer with evidence and reasoning.**

Liver biopsy sample	Number of mitochondria per cell
A	2,100
B	4,350
C	1,950