Comparing Normal Cells and Cancer Cells

Cancer arises in cells due to abnormal genetic changes and can lead to other genetic, structural, and molecular alterations. Typically, the cell cycle of cancerous cells is disrupted compared with that of normal cells from the same tissue. The data shown here are from six different tissue samples. The samples were collected to determine whether the tissue in question contains cancerous cells. In this activity, your task is to analyze the data and make a claim for which samples are most likely to contain cancerous cells.

1. PLAN AN INVESTIGATION

With your team, formulate a plan for analyzing the data. Decide how you will compare the data, what calculations you will need to perform, and which type of graph would be best for displaying these data. You may want to make multiple graphs or sets of calculations to compare the data in multiple ways.

2. ANALYZE DATA

On your own, show the work for the calculations performed. Construct the necessary graph(s) based on what your group decided. You may use a computer program if necessary.

3. EVALUATE DATA

Based on your findings, which samples are more likely to contain cancerous cells? Compare your findings with the group. Are there any other patterns you can identify?

4. COMMUNICATE

Write a report explaining your conclusions, including a claim, evidence, and reasoning. Your claim should state which samples are most likely to contain cancerous cells, and you should explain, in detail, how your analysis of the data supports your claim. In addition, describe some of the factors that might have caused the cancerous cells to become cancerous. How is the cell cycle related to the development of these types of cells? How is a person's genetic material and external environment related to the development of cancer?

FIGURE 5: For each tissue sample, the number of cells in each phase were counted and recorded.

	Sample 1	Sample 2	Sample 3
Interphase	33	34	34
Prophase	2	2	1
Metaphase	1	3	2
Anaphase	2	2	2
Telophase	1	3	1

	Sample 4	Sample 5	Sample 6
Interphase	35	33	35
Prophase	3	3	3
Metaphase	1	2	2
Anaphase	0	2	4
Telophase	1	3	3

CHECK YOUR WORK

A complete presentation should include the following information:

- a clearly defined plan for analyzing and evaluating the data
- a clear conclusion based on evidence and supporting analysis
- one or more graphs displaying the data you evaluated in your investigation
- an explanation of which cells are most likely to be cancerous cells using evidence to support your claims