

Name: _____ Period: _____

1.3 GRAPHING & ANALYZING PRACTICE

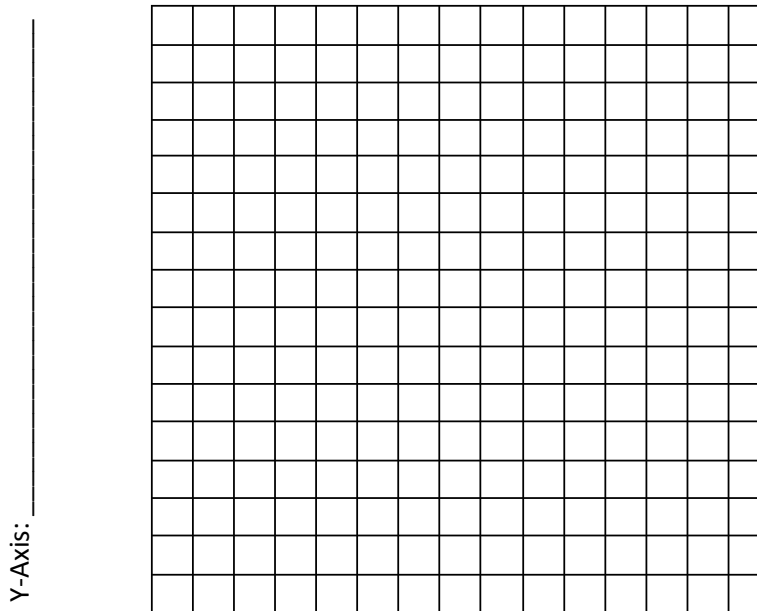


PROBLEM #1:

Hydrogen peroxide (H_2O_2) is formed as a by-product of some biochemical processes in cells. Unfortunately, it is toxic to the cells that produce it, making it necessary for the cell to break the H_2O_2 down into substances that will not harm the cell. An enzyme called catalase is found within most cells for this purpose. Catalase speeds up the breakdown of H_2O_2 into two products, water and oxygen. In an experiment, yeast cells were used to test the effectiveness of the enzyme catalase at various temperatures. The scientist wanted to determine the optimum temperature for the functioning of this enzyme. The yeasts were placed in hydrogen peroxide solutions that had been heated to varying temperatures. An experimental apparatus was used that detected the number of oxygen bubbles produced as the H_2O_2 was decomposed. The table below shows the results that were obtained. Graph these results on the grid provided below. Be sure to provide titles for your axes and title your graph!

Temperature (°C)	0	10	20	30	40	50	60	70
Number of bubbles of gas produced per minute	0	2	6	15	6	3	1	0

Title: _____



X-Axis: _____

- What is the independent variable in this experiment? _____
- What is the dependent variable in this experiment? _____
- List at least three controlled variables in this experiment.

- d. Describe an interpolation you could make on this graph. Give the particular data point that you are inferring.

- e. Based on these results, what reasonable conclusion can be reached about the effect of temperature on the functioning of the enzyme catalase? (Write in a full sentence!)

PROBLEM #2:

Daphnia are small crustaceans that are often called water fleas. They are an important part of the food chain, as they serve as food for many other organisms found in aquatic ecosystems. They are small, but are visible with the naked eye. They are often placed under a microscope for study. One feature that makes the Daphnia a good organism for lab experiments is the fact that its beating heart is easily visible when observed under a microscope.



An experiment was conducted to test the effect that different temperatures have upon the heart rate of Daphnia. The scientist placed the Daphnia in the chamber of a depression slide filled with water. The chamber was then sealed. The temperature of the water inside the depression slide chamber was manipulated by placing the slide, one after the other, in small dishes containing: (1) crushed ice (5°Celsius), (2) room temperature water (23°Celsius), and (3) water that had been warmed (50°Celsius). As the Daphnia was being subjected to these three different temperatures, it was being observed under a microscope and the number of heartbeats per minute was recorded. The data collected is in the table below. Graph these results on the grid provided below. Be sure to provide titles for your axes! And title your graph!

Beats/Min	Temperature of Surrounding Air		
	5°C	23°C	50°C
Trial 1			
Trial 2			
Trial 3			
Average			

Title: _____

Y-AXIS: _____

X-Axis: _____

- a. What is the independent variable in this experiment? _____
- b. What is the dependent variable in this experiment? _____

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- c. Based on these results, what conclusion can be reached about the effect of temperature on the heart rate of Daphnia? (Write at least 1-2 FULL sentences!)
- d. You want to now test the affects of coffee and sugar water on the heart rate (beats/min) of Daphnia. Answer the following:
- 1) Control group: _____
 - 2) Experimental group(s): _____
 - 3) Write a hypothesis state for this experiment (ITB!).
- e. Describe an extrapolation you could make on this graph. Give the particular data point that you are inferring.

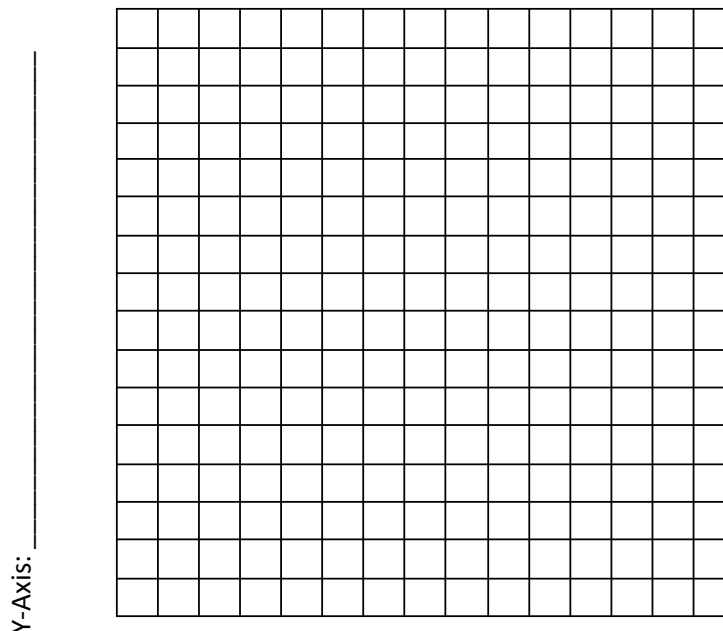
PROBLEM #3:

The florist industry is a big business. The producers of flowers are constantly looking for ways to increase and improve the flowering capacity of the plants they raise and sell. A grower put together a special blend of fertilizers and plant nutrients in hopes of increasing his blossom yield. He tested different concentrations of this special blend on three different types of flowering plants to see which concentration would produce the greatest number of blossoms per plant. The results are shown in the table below.

Plants Tested (# of blossoms)	0% solution of fertilizer	5% solution of fertilizer	10% solution of fertilizer	20% solution of fertilizer	30% solution of fertilizer
Roses	5	8	16	28	20
Daisies	3	5	8	13	18
Gladiolas	8	29	26	15	3

Graph these results on the grid provided below. Be sure to provide titles for your axes! And title your graph! (Note: this graph is a little more complex! It is a **multi-line** graph! % solution fertilizer is continuous data!)

Title: _____



X-Axis: _____

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- a. What is the independent variable in this experiment? _____
- b. What is the dependent variable in this experiment? _____
- c. List at least three controlled variables in this experiment.

- d. What conclusion can you reach about the effectiveness of the special blend of fertilizer on blossom production in these plants? (Write 1-2 FULL sentences.) (Which fertilizer concentration is most effective?)