Name: _____ Section: _____

Diane's Experiment

Directions: Read the passage below and complete the questions to show your understanding of Diane's experiment.

Diane was a member of the middle school band and one day after practicing with her trombone she wondered if playing her instrument would cause a change in the amount of carbon dioxide (CO_2) in the room. Her curiosity was "sparked" by a recent lesson in science class on respiration. During this lesson she learned that people inhale oxygen and exhale CO_2. Consequently, she designed and conducted an experiment. For her experiment she utilized a Vernier CO_2 measuring sensor, a LabQuest interface for the sensor, a computer, her trombone, and a musical selection. She then proceeded to measure the CO_2 levels in the room for ten minutes without playing any instrument and then for ten minutes while playing her trombone. She then repeated this process two more times. Diane compiled all of her data in table as shown below. Additionally, she determined that the average increase in CO_2 while not playing was **185.7 parts per million (ppm)** and **222 ppm** while playing her trombone.

Table 1. Change in Carbon Dioxide Levels during Trials 1 – 3.

Trial		Min. CO_2 Level (ppm)	Max. CO_2 Level (ppm)	Change in CO_2 level (ppm)
1	Without Playing Instrument	413	590	Increased by 177
	While Playing Instrument	284	493	Increased by 209
2	Without Playing Instrument	423	580	Increased by 157
	While Playing Instrument	471	685	Increased by 214
3	Without Playing Instrument	500	723	Increased by 223
	While Playing Instrument	529	772	Increased by 243

1. What do you think Diane's hypothesis is?

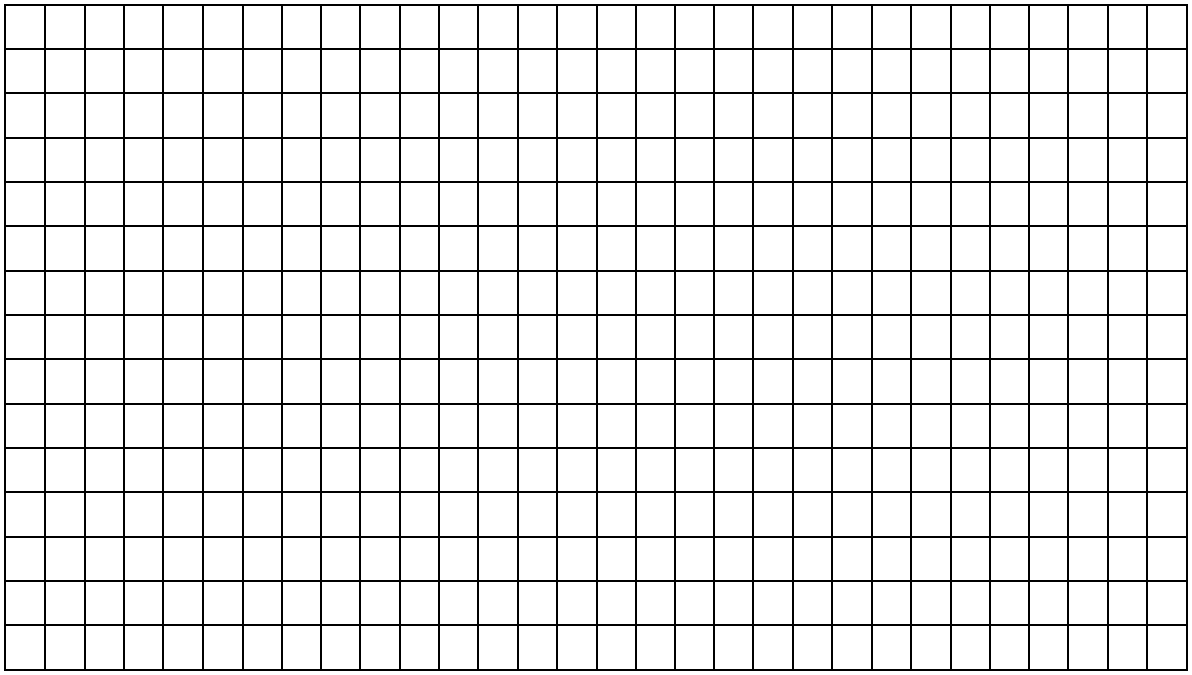
2. What is the experiment's independent variable? Explain your reasoning.

3. What is the experiment's dependent variable? Explain your reasoning.

4. Identify **two** constants from the experiment.

5. What do you think the experiment's control is? Explain your reasoning.

6. Use the grid below to construct a bar graph illustrating the **average increase in CO_2 levels** when the instrument is not being played compared to when it is being played. Make sure that your graph has a title, a labeled x and y axis, and the appropriate number scale.



7. According to the data as illustrated in the graph, do you think the data/results support Diane's hypothesis? Why or why not?