

Name _____

Breathing Rate Lab

Background Information: Oxygen is essential to life. We use the oxygen we breathe and the food we eat to produce energy in the form of ATP. Physical activity increases our need for energy, increasing the use of oxygen and nutrients. The body can store some of the things it needs to function. For example, glucose can be stored in the liver as glycogen. However, oxygen cannot be stored for more than a few minutes at a time.

At rest, the blood holds about a quart of dissolved oxygen, but it is constantly being used by the cells to produce energy during cellular respiration. The respiratory system must work all the time to supply enough oxygen to the body.

Question: What is the effect of exercise on breathing rate?

Hypothesis: Fill in with an If, Then statement

If the amount of activity increases, then the _____.

Materials: timer

Procedure:

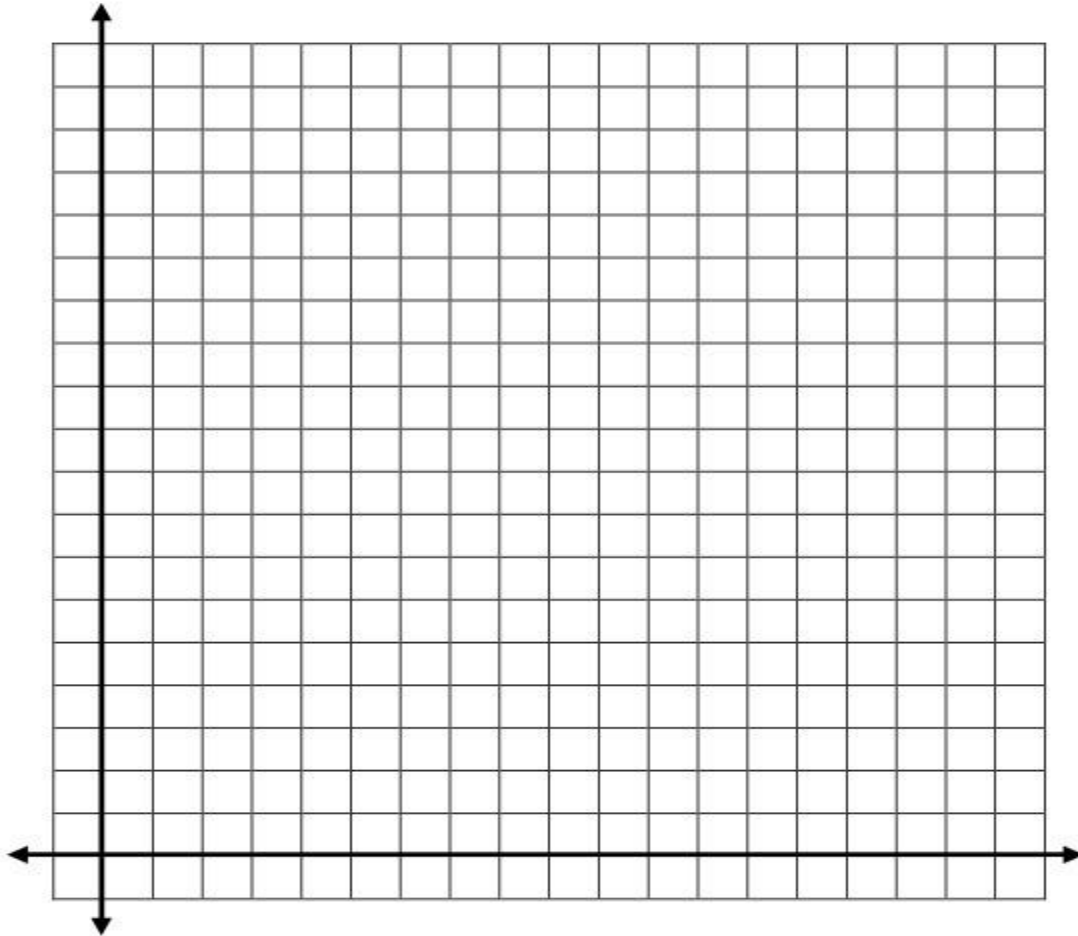
1. Work with a partner. One person will be the participant; the other will be the investigator. If you do not have someone to partner with, take and record your own breathing rate using the procedures given. The investigator is responsible for starting, stopping and timing. The participant is responsible for counting the breaths he/she takes during the investigation.
2. The participant will sit very still for 1 minute; breathing normally. After the 1 minute, the investigator will signal the participant to count how many complete breaths (in and out) he/she takes in one minute. The investigator will watch the clock and start and stop the participant.
3. Record the data in the spreadsheet.
4. The participant will walk in place for 1 minute; breathing normally. After the 1 minute of walking, the investigator will signal the participant to count how many complete breaths (in and out) he/she takes in one minute. The investigator will watch the clock and start and stop the participant.
5. Record the data on the spreadsheet.
6. The participant will jog in place for 1 minute; breathing normally. After the 1 minute of jogging, the investigator will signal the participant to count how many complete breaths (in and out) he/she takes in one minute. The investigator will watch the clock and start and stop the participant.
7. Record the data on the spreadsheet.
8. Switch participant / investigator roles and repeat the experiment.

Data Table:

Activity	Breathing Rate (breaths/minute)
Sitting still	
Walking	
Jogging	

Data Analysis:

Make a bar graph of your data. Remember to add a title, scale and labels to the graph.



Conclusions: Go back to the original question and hypothesis. Did your data support your hypothesis? _____

Write a paragraph describing the relationship between breathing rate and exercise based on your results using the Claim, Evidence, Reasoning format.

CLAIM: _____

EVIDENCE: _____

REASONING (your reasoning needs to make a connection between your lungs taking in oxygen and what the oxygen is used for in your cells and what your muscles need when you exercise): _____

List 6 systems that worked together to complete this lab. Then, explain how the systems worked together.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
