

Name \_\_\_\_\_

## Heart Rate Lab

**Background Information:** Your heart is a muscle that pumps the blood through your body. To get an idea of its size, make a fist; this is about the same size as your heart. Try opening your band about halfway and then closing it again. This is what your heart does. Keep doing this for 1 minute. How does your hand feel? Why?

Your muscles get energy through the chemical reaction *cellular respiration*, which requires oxygen. You get this oxygen when you breathe. Your muscles can continue to work as long as they have plenty of oxygen. What happens when your muscles use oxygen faster than it can be delivered? You felt the effects in your hand already. Your muscles do not quit working when they run low on oxygen. Instead, a different chemical reaction takes place, called *lactic acid fermentation*.

Lactic acid fermentation allows your cells to continue glycolysis so ATP can be produced when there isn't enough oxygen for the electron transport chain to continue. This is what you felt in your hand. This is also what you will feel in your muscles if you start running or lifting weights. Luckily, your heart does not get tired like your hand does. Regular exercise can increase blood flow to muscles; this allows your muscles to work longer and harder before getting tired.

Your heart beats continuously throughout your lifetime. The rate at which a heart beats varies based on age and fitness level. A more fit person's heart tends to beat slower than an inactive person's heart. One way to measure the number of times a heart beats is to find your pulse. The easiest places to find your pulse are on the side of your throat or on your wrist.

**Question:** What is the effect of exercise on the heart rate?

**Hypothesis:** Fill in using an If, Then statement

If the amount of activity increases, then the \_\_\_\_\_.

**Materials:** timer

**Procedure:**

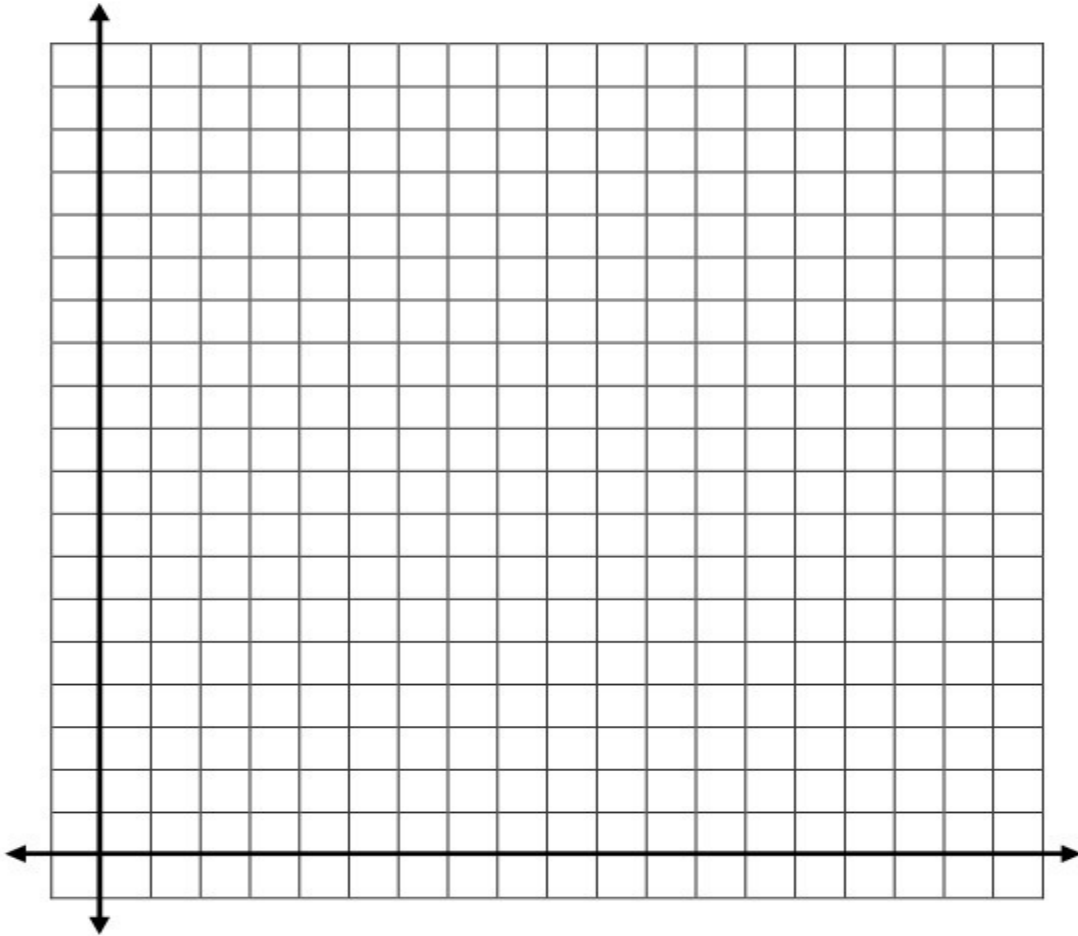
1. Find your heart and see if you can feel your heartbeat with your hand. Next, try finding your pulse using two fingers against the side of your throat and your wrist. On your wrist, trying to feel slightly off center on the pinky side of your wrist (I honestly cannot find a pulse in my right wrist, but my left is easy; so feel around for it). Don't use your thumb, it has its own pulse.
2. 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 heart rate using the procedures given. The investigator is responsible for starting, stopping and timing. The participant is responsible for counting the beats he/she feels during the investigation. If you do not have a partner, set a 1-minute time, do not watch the clock for a minute, you'll likely lose count.
3. 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 beats he/she feels in one minute. The investigator will watch the clock and start and stop the participant.
4. Record the data in the spreadsheet.
5. 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 beats he/she feels in one minute. The investigator will watch the clock and start and stop the participant.
6. Record the data on the spreadsheet.
7. 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 beats he/she feels in one minute. The investigator will watch the clock and start and stop the participant.
8. Record the data on the spreadsheet.
9. Switch participant / investigator roles and repeat the experiment.

**Data Table:**

Activity	Heart Rate (beats/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.



Describe the relationship between heart rate and exercise. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Conclusions:** We did a similar lab in which we measured the breathing rate. When you did this lab (correctly), your breathing rate increased as exercise increased. Write a paragraph describing the relationship between the breathing rate and heart rate. Be sure to explain the complete reason for the relationship.

**CLAIM:** \_\_\_\_\_  
\_\_\_\_\_

**EVIDENCE:** \_\_\_\_\_  
\_\_\_\_\_

**REASONING:** \_\_\_\_\_  
\_\_\_\_\_