How do our lungs and heart work together to achieve homeostasis?

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Purpose

How do my heart and lungs work together to achieve homeostatic balance during exercise?

Background Information

The purpose of this experiment is to examine how the heart and lungs work together to achieve homeostasis during exercise. It is important to study this subject because in order to live a healthy and long life, I have to be able to understand my body and what it needs to do in order to maintain a biological balance.

Homeostasis is when the organs of the body work together to keep all internal physiological functions balanced. This is important because out bodies need to keep temperature, pH and other important processes stable in order to carry out its every day activities. During exercise, our body works extra hard to keep our processes balanced. For instance, when exercising our heart beats faster. This is so that our muscles get the extra oxygen that they need. Moving blood faster through the body also helps remove the toxic carbon dioxide. Your lungs also increase in size during exercise. This is so that your body can bring in more oxygen and get rid of the extra carbon dioxide that has built up in the blood. These two processes in one of the many ways that the respiratory and circulatory systems work together to achieve homeostasis during exercise.

I hope to see homeostasis in action. I hope that this laboratory experiment gives me a new perspective on how hard my body works in order to keep me alive. I feel that this experiment will be challenging because I have never written a lab report before. I also have never used a spirometer, the device that we are using to collect our data. I hope that by challenging myself I will learn more about myself, my classmates and physiology.

Hypothesis

If I exercise, then my heart rate will increase and my lungs will increase in volume because my body needs more oxygen and needs to get rid of carbon dioxide.

Materials

1 pencil
A lab packet for the heart lab and the lung lab
1 spirometer
1 stopwatch

Procedure

Procedure for the Lung Volume Lab

1.) Choose one person in the group who will be the test subject. Keep in mind that this will be person who will be the test subject for the heart rate lab.

2.) Have the test subject sit calmly for 1 minute. Time this on the stop watch.

3.) Have the test subject blow three times in a row into the spirometer. Record the number you see on the spirometer in Table 1.

4.) Wait one minute. Have the test subject do 10 jumping jacks. One they are done with the jumping jacks have them immediately breathe into the spirometer three times in a row. Record this data in Table 1.

5.) Have the test subject do 10 more jumping jacks and then immediately breathe into the spirometer three times in a row. Record this data in Table 1 under the heading “round 2”. Continue this process until the person has completed 5 rounds of this process and all tables are filled out.

6.) Have the test subject rest for 5 minutes. Be sure to time this on the stop watch. 7.) Repeat steps 1 through 5. Record all data for this round in Table 2. 8.) Have the test subject rest for 5 minutes. Be sure to time this on the stop watch. 9.) Repeat steps 1 through 5. Record all data for this round in Table 3.

10.) Finish the lab packet.

Procedure for Heart Rate Lab

1.) Choose one person in the group who will be the test subject. Keep in mind that this will be person who will be the test subject for the lung size lab.

2.) Have the test subject sit calmly for 1 minute. Time this on the stop watch.

3.) Have the test subject count their pulse for 15 seconds. Multiply this number by 4 and record it in table 1.

4.) Wait one minute. Have the test subject do 10 jumping jacks. Once they are done with the jumping jacks have them count their pulse for 15 seconds. Multiply this number by 4 and record it in table 1.
5.) Have the test subject do 10 more jumping jacks. Once they are done with the jumping jacks have them count their pulse for 15 seconds. Multiply this number by 4 and record it in table 1. Continue this process until the person has done 50 jumping jacks in total.

6.) Have the test subject rest for 5 minutes. Be sure to time this on the stop watch.

7.) Repeat steps 1 through 5. Record all data for this round in Table 2.

8.) Have the test subject rest for 5 minutes. Be sure to time this on the stop watch.

9.) Repeat steps 1 through 5. Record all data for this round in Table 3.

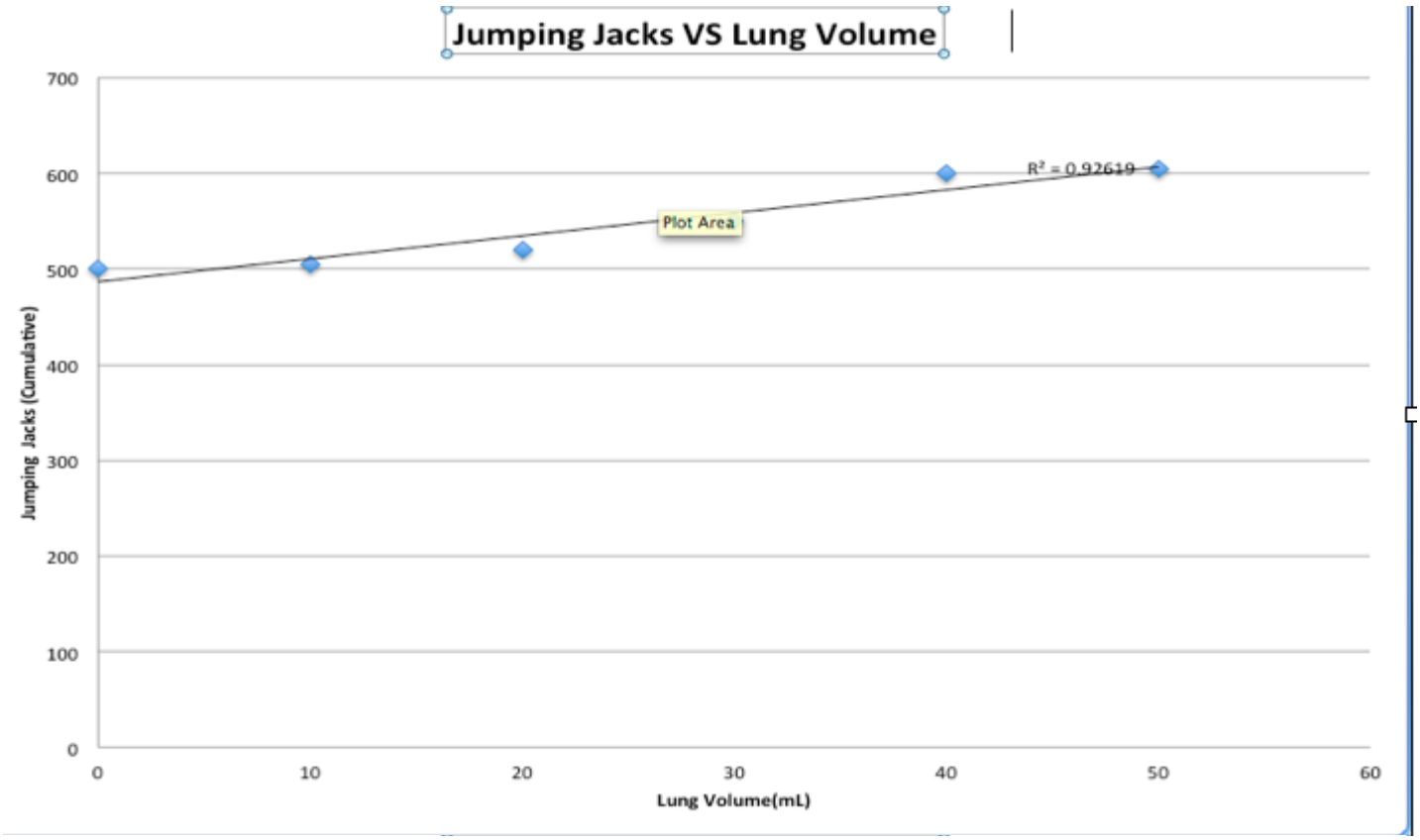
10.) Finish the lab packet.

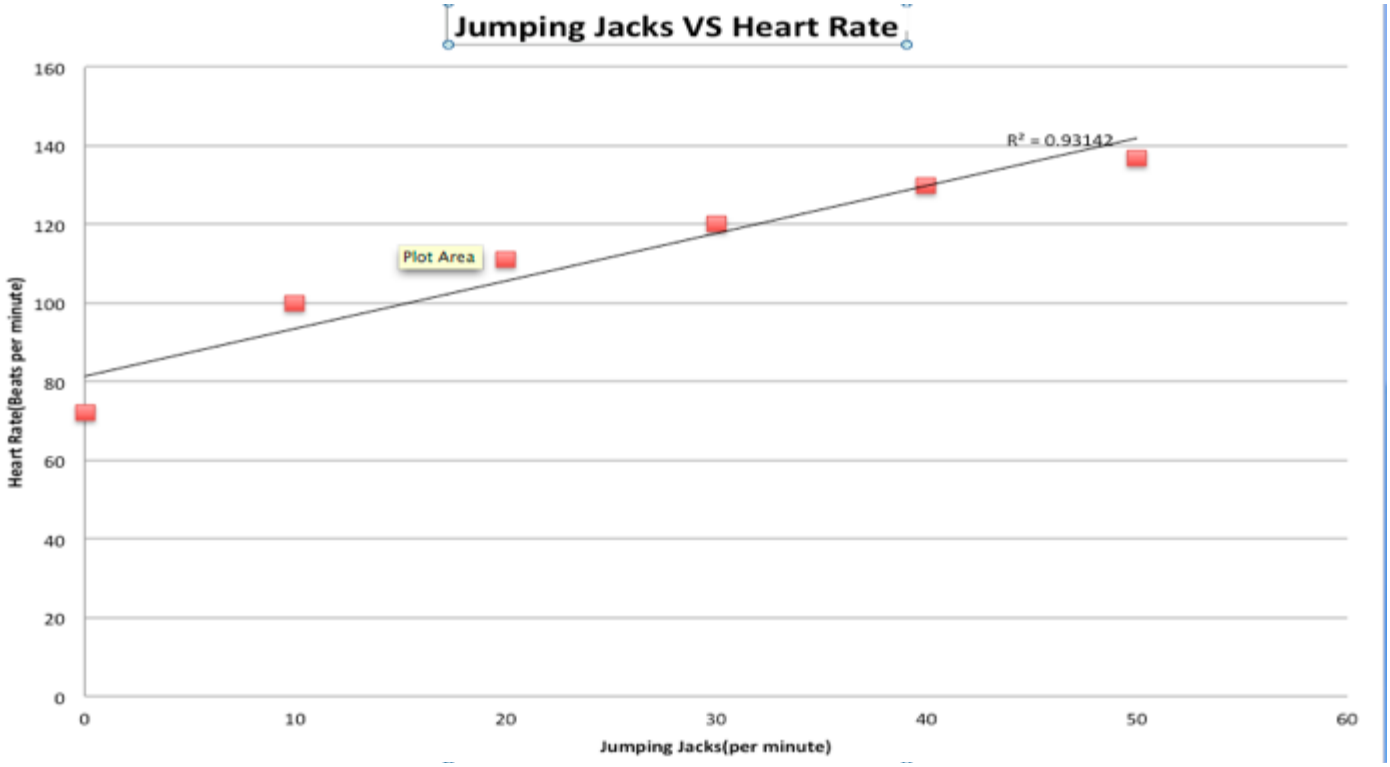
Data for lung volume Lab

Heart rate while resting	Volume of lungs after 10 jumping jacks	Volume of lungs after 10 more jumping jacks	Volume of lungs after 10 more jumping jacks	Volume of lung s after 10 more jumping jacks	Volume of lungs after 10 more jumping jacks
400	400	350	350	400	420
320	350	380	360	370	380
360	425	325	370	390	390

Data for Heart Rate Lab

Heart rate while resting	Heart rate after 10 jumping jacks	Heart rate after 10 more jumping jacks	Heart rate after 10 more jumping jacks	Heart rate after 10 more jumping jacks	Heart rate after 10 more jumping jacks
54	59	63	69	72	87
45	63	380	360	370	380
360	425	325	370	390	390





CONCLUSION

After finishing this project I noticed that my heart rate and lung volume did increase. As you can see on my graphs my heart rate and lung volume increases and it goes up more as you exercise more.

My project is showing us if our body's react as we exercise. Its it tells you the R squared value and more. Some erros that happend threw my project was that we didnt see the instructions so instead of one only trying the experiment we all tried it and it was only suppose to be one classmate who exercise for the whole thing.

I would like to change how my group work because we were just playin around and making jokes. I think if we would of read all the instructions we would of had a better grade. If we diged deaper to the experiment then we would of probably had an accurate data.