Vital Signs
How does exercise affect your heart and lungs?

**Purpose:** In this experiment I will be measuring ____________________________
by ________________________________________________________________________.

**Procedure:**

1. Gather all lab materials with your lab group. You can have up to 3 people in your lab group. Your group will need some way to keep track of time.

2. **Find your resting heart rate:** Each person will be recording his or her resting heart rate first. To do this, press two forefingers to the side of your neck until you can feel your pulse.

3. Count the number of heartbeats that occur in 6 seconds. Multiply this number by 10 to find the number of heartbeats per minute.

4. Record your resting heart rate in the corresponding data table.

5. **Find your resting breathing rate:** Each person will now be recording his or her resting breathing rate. To do this, count the number of breaths you take in 6 seconds. Multiply this number by 10 to find the number of heartbeats per minute. Record your breathing rate in the data table.

6. Each team member should do jumping jacks for 30 seconds. Immediately after the 30 seconds have passed, measure your heart rate. Then, measure your breathing rate. Record both values in the table.

7. Repeat Step #6 after 60 seconds of exercise.

8. Repeat Step #6 after 90 seconds of exercise.


Create Your Hypothesis:
If I exercise for a longer amount of time, my heart rate will ________________
and my breathing rate will ________________ because ____________________
_______________________________________________________________________.

Data Collection:
Person #1 Name: _________________________________
Person #2 Name: _________________________________
Person #3 Name: _________________________________

Before exercising, record each person’s resting heart and breathing rates. This is
the number of beats/breaths when at rest (NOT exercising).

<table>
<thead>
<tr>
<th>Resting Rate</th>
<th>Heart rate</th>
<th>Breathing rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person #1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person #2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person #3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hint: You can calculate the average heart and breathing rate by adding up the
number of beats/breaths for Person #1, #2, and #3 and then dividing by 3.

Record each person’s heart and breathing rate after 30 seconds of jumping jacks.

<table>
<thead>
<tr>
<th>After 30 seconds</th>
<th>Heart rate</th>
<th>Breathing rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person #1</td>
<td></td>
<td></td>
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</tbody>
</table>
After resting, record each person’s heart and breathing rate after 60 seconds of jumping jacks.

<table>
<thead>
<tr>
<th></th>
<th>After 60 seconds</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heart rate</td>
<td>Breathing rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person #2</td>
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<tr>
<td>Person #3</td>
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</tr>
<tr>
<td>Average</td>
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</tbody>
</table>

After resting, record each person’s heart and breathing rate after 90 seconds of jumping jacks.

<table>
<thead>
<tr>
<th></th>
<th>After 90 seconds</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Heart rate</td>
<td>Breathing rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person #1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person #2</td>
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<td></td>
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<tr>
<td>Person #3</td>
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<tr>
<td>Average</td>
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</tbody>
</table>
Data Analysis:

1) My resting heart rate was _______ beats per minute. My resting breathing rate was _______ breaths per minute. After 90 seconds of exercise, my heart rate was _______ beats per minute and _______ breaths per minute.

2) How did your resting heart rate compare to your heart rate after 90 seconds of exercise? Is this what you expected? Why or why not?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3) Did you observe similar results across all three people? Is this what you expected? Why?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
4) Create a line graph of each person’s heart rate over time below. Graph the results for all 3 people in your lab group by using different colors for the three line graphs. Don’t forget to include a key!

**Line Graph Key:**
*Record the color you used for each person below.*

- Person #1
- Person #2
- Person #3
Conclusion:

Based on your data, what impact did exercise have on your heart and lungs? How could you tell?

________________________________________________________________________
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________________________________________________________________________