Homeostasis Lab: The Effects of Exercise on Homeostasis

31 points

Purpose
To discover the effect that various levels of exercise have on specific body parameters.

Hypothesis
Write one hypothesis describing how you predict the 5 parameters below will change as the subject exercises.
- change in skin color on arms and face
- perspiration level
- external body temperature
- heart rate
- breathing rate

Hypothesis: 5 points
If ________________(name of student exercising) exercises for several minutes, then we would expect
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Materials
Thermometer and stopwatch.

Introduction
Exercise causes many homeostatic factors to kick in, in an effort to maintain internal homeostasis. How
exercise affects some of these homeostatic factors can be determined by measuring and observing certain
parameters.

In the following lab 1 member of your group will exercise for 8 minutes by skipping in place. The parameters
listed above will be recorded at rest, 2 minutes, 4 minutes, 6 minutes and 8 minutes, and 1 minute after
exercise has stopped. The subject should stop just long enough for the needed measurements to be taken.
ALL MEMBERS MUST HELP!!! Record all data in the table provided.

Procedure
1. Each group should obtain: a thermometer and a stopwatch.
2. Record the RESTING observations and values of your subject for each of the 5 parameters.
   a. Record normal skin color of hands and face (i.e. pale, pink, red, etc.)
   b. Record normal perspiration level (i.e. none, mild, medium, high, etc.)
   c. Record external body temperature by placing the thermometer under the subject’s arm pit for one
      minute (note: measurements should be taken directly from the skin).
   d. Determine the breathing rate by counting the number of breaths taken in 10 seconds and multiply by 6.
   e. Determine the heart rate by counting the number of breaths taken in 10 seconds and multiply by 6.
3. Have your subject begin to skip in place. Please note your subject should be sure to exercise at a level
   they can maintain for the entire 8 minutes.
4. Take your subject’s parameter readings using the same techniques described above at the 2, 4, 6, and 8
   minute time markers. Be sure to take final readings 1 minute after your subject has stopped exercising.
5. Record all of your parameter readings in the table provided.
6. After cleaning your thermometer, return it along with the other lab materials to the bin.
### Results: 12 points

<table>
<thead>
<tr>
<th></th>
<th>Body Color</th>
<th>Perspiration Level</th>
<th>Body Temp (Celsius) Wait 30 sec for reading</th>
<th>Heart Rate (beats/min) Measure how many in 10 seconds and multiply by 6</th>
<th>Breathing Rate (breaths/min) Measure how many in 10 seconds and multiply by 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>REST</td>
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<td></td>
<td></td>
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<tr>
<td>2 min of exercise</td>
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<td>4 min of exercise</td>
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<td>6 min of exercise</td>
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<td>8 min of exercise</td>
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<td>1 min after exercise</td>
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</tbody>
</table>

### Analysis

1. Plot your measured data for heart rate in the graph below. The graph should have time across the bottom and heart rate (beats/min) on the side. **3 points**
2. Write a paragraph describing your results for each of the 5 parameters in regards to homeostasis. The paragraph should be no less than 5 sentences long. 5 points

Conclusion Questions: You may need to use your notes or book to answer some of these questions. 1 point each

1. Read your hypothesis. Do your results support your hypothesis?________
2. Why were there changes in body color and perspiration level?

3. How do the changes above in #1 contribute to the maintenance of homeostasis?

4. What other mechanisms does your body use to maintain its homeostatic temperature?

5. Why does an increase in heart rate and breathing rate accompany exercise?

6. Study your measurements after exercise has stopped. What conclusions can you make about your body’s ability to maintain homeostasis?