Homeostasis Lab **Name:** _____

Material: Stopwatch Thermometer

Background:
Exercise causes many factors of *homeostasis* to kick in to maintain internal equilibrium. How exercise affects some of these factors can be determined by measuring and observing certain conditions of the human body. Some of these conditions are:

- Change in skin color on arms and face
- Perspiration level
- External body temperature
- Breathing rate
- Heart rate

PreLab Notes:
1. Working in groups of 3 or 4, select a student that will be able to do jumping jacks well and will be able to maintain jumping for 6 minutes. The group member will stop just long enough for the needed measurements and observations to be collected.
2. **Record** the resting observations and values of the person jumping using the following:
    - Skin color of hands and face (pale, pink, red)
    - Perspiration level (none, mild, medium, high)
    - External body temperature (place the thermometer under the subjects arm pit for 1 minute)
    - Breathing rate (count the number of breaths in 1 minute)
    - Heart Rate (find the pulse at the wrist and count the number of beats in 1 minute)

Procedure:
1. Make observations and measurements of the person who will do jumping jacks while they are sitting down and resting. Record your observations on the data table.
2. The student doing jumping jacks should begin jumping when the person with the stopwatch gives the signal and continue jumping for 2 minutes. After 2 minutes ***quickly*** make observations and measurements and record them on the data table.
* For breathing rate/heart rate take information for 15 seconds then multiply by 4 (15 seconds * 4 = 1 minute)
3. The student will continue jumping at 2 minute intervals until the 6 minute time period has been completed. After each 2 minute interval observations and measurements should be made.
4. When the 6 minutes is up, the student jumping will rest for 1 minute. After 1 minute, observations and measurements will be taken for the final time. Don't forget to record the data on the data table.

Observations:

	Body Color (pale, pink, red)	**Perspiration (none, mild, med, high)**	**Body Temp (˚C)**	**Heart Rate (beats/ minute)**	**Breathing Rate (breaths/minute)**
Rest					
2 minutes of exercise					
4 minutes of exercise					

6 minutes of exercise					

Analysis:

1. Plot your data for Body Temperature, Heart Rate, and Breathing Rate on 3 graphs. (Time, Measurements)

2. List the changes you observed in the body color and perspiration level in response to exercise.

3. Explain how the changes help the body adjust to maintain equilibrium.

4. Speculate why a change in body temperature occurs?

5. Name which *mechanisms* your body uses to maintain a constant body temperature?

6. Explain why an increased breathing rate accompanies exercise?

7. Explain why an increased breathing rate accompanies exercise?

8. Write a concluding paragraph about the conclusions you can draw about your body's ability to maintain equilibrium (homeostasis). Be sure to include the answers to the questions above. **Claim – Evidence - Reasoning**