Name:

Date:

School:

Facilitator:

4.03 Lab: Exercise Effect on the Heart

# Pre-Lab

* **You will design an experiment to test how an activity affects your heart rate. You will carry out your experiment, analyze your data, and report your results on this form. Read the following to learn about pulse rate and complete the required questions.**
1. **Read this information about taking your pulse rate:**

Each time the heart beats, blood is pumped into the arteries. The arteries stretch and bulge each time blood is pumped by a heartbeat (ventricular contraction or systole). This stretching and bulging can be palpated (or felt) at specific places on the skin over the artery. This bulging that is felt is called a “pulse,” and is at the same rate as the heartbeat.

* + To measure your pulse rate, place the tips of your 2nd and 3rd digits over your anterior wrist (this is over the radial artery – see image).



* + Count how many times you feel it bulge in 15 seconds. Then, multiply that number by 4. This is your pulse rate for 1 minute.
	+ Practice counting the number of pulses in 15 seconds. Multiply that number by 4 to get heart rate (number of heart beats per minute or bpm).
	+ **Record your resting one-minute pulse rate here:**
* **Introduction**
1. **Purpose:** The purpose of this lab is to evaluate the short-term effects exercise activity has on the heart.
2. **Compose a paragraph summarizing the heart. Type your answer within the box below. Include the following in this paragraph:** Function of the heart, why blood needs to circulate throughout the body, and how to calculate heart beats per minute by palpating (feeling) a pulse on the wrist area.

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* **Questions for Thought**
1. Does your heart always beat at the same rate?
2. In the table below, list some activities or stimuli that you think may increase your heart rate.

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| Activities (something you do) |       |
| Stimuli (input from the environment) |       |

1. Explain why it would be useful for your heart to beat faster during the activities or stimuli you listed in the table?
2. List any activities or stimuli that you think may decrease your heart rate?

# The Experiment

**Now, it is time to design an experiment to test your ideas concerning the short-term effects of exercise on your heart rate. Complete the following to guide you in this process:**

1. Choose and list an exercise activity to test which may increase your heart rate.

2. What is the **question** this experiment will answer?

3. Compose a **hypothesis** (a tentative, testable answer to a scientific question) to your question by using the example format, but with your chosen activity and prediction substituted for the areas in red (Do not use the activity listed in the example as your activity to test).

**a. Example:**

If I jog in place for 2 minutes, my heart rate will increase above my resting heart rate of 75 as evidenced by an immediate post-exercise pulse check.

**b. Your Hypothesis:**

 If I      , my heart rate will       as evidenced by an immediate post-exercise pulse check.

4. Record your **procedure** (exact steps for completing the experiment) to test your hypothesis in the box below. Please use a step-by-step list that is numbered. Think of it as a recipe that someone else could read and repeat from reading your instructions.

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5. Repeat your experiment 3 times, create a table, and record your **results** **in that table**. Include resting heart rate, post-activity heart rate, and the change in heart rate (difference between the resting heart rate and post-activity heart rate) values for each of the 3 tests.

6. **Analyze** the results and summarize that information in paragraph format here. (What are the highlighted results/trends, and what change occurred in heart rate? Do not mention the hypothesis being supported or not supported in this section).

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7. Write a **conclusion. (**Do your results support your hypothesis? What evidence do you have that the results support or do not support the hypothesis? What conclusions can you draw from your experiment? What is a new question that could be tested related to activity and heart rate?)

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