

**4. Flowchart/Procedures: diagrams/lists that would allow another student to repeat your steps of your lab. If appropriate, this may include a list of materials required.**

Teacher Sign-Off \_\_\_\_\_

1. IMPORTANT!! All readings are for 15 seconds, multiply by 4 to get data for 1 minute
2. Start with identifying your "resting" heart rate". See the Background for the correct procedure. Sit quietly for two minutes, then take three readings - rest for one minute in-between readings. Calculate an average for your resting heart rate and record your results in your data table. Include a diagram of where/how you take your pulse.

3. Choose three different activities. **Write the procedure for only the three activities you have chosen! Include a diagram for each activity.**

- a. **Stand at Attention** - stand at attention for two minutes. While the subject is still standing take the pulse rate for fifteen seconds. Record the data. Then it should be taken again after 45 seconds, so that a fifteen second pulse is taken every minute for 6 minutes.
- b. **Holding Breath** - While seated the subject should take a deep breath, exhale part of it, and hold the breath as long as possible. (No passing out!) At first breath take the pulse rate for fifteen seconds and record your data. The experimenter should begin breathing normally. Then it should be taken again after 45 seconds, so that a fifteen second pulse is taken every minute for 6 minutes.
- c. **Deep Breaths** - While seated, the subject should take deep, slow breaths regularly for 1 minute. After one minute take the pulse rate for fifteen seconds. as the experimenter begins to breath normally. Then it should be taken again after 45 seconds, so that a fifteen second pulse is taken every minute for 6 minutes.
- d. **Exercise** - The experimenter should do jumping jacks for one minute. Immediately after exercise, the pulse should be taken for 15 seconds. Then it should be taken again after 45 seconds, so that a fifteen second pulse is taken every minute for 6 minutes.
- e. **Lying down** - The experimenter should lie down on their back with their arms at their sides. At the end of the minute the pulse should be taken while the experimenter is still lying down. Now have the experimenter slowly sit up. Then the pulse should be taken again after 45 seconds, so that a fifteen second pulse is taken every minute for 6 minutes.

**5. Data Table Set-up:** First column is the independent variable, followed by your dependent variable (data) and finally any derived calculations. Include any math calculations *below your graph* in your notebook – if appropriate.

Title: Table 1: Resting Heart Rate

Resting Heart Rate	Pulse Rate (15 secs)	Pulse Rate (1 minute)
Trial 1		
Trial 2		
Trial 3		
My Average	XXXXXXXXXXXXXXXXXXXXXXX	
Female Average	XXXXXXXXXXXXXXXXXXXXXXX	
Male Average	XXXXXXXXXXXXXXXXXXXXXXX	

Title: Table2: Activity Data Table

Activity	Pulse Rate (per 15 seconds) / per minute					
	Immediately after activity	1	2	3	4	5
		( )	( )	( )	( )	( )
		( )	( )	( )	( )	( )
		( )	( )	( )	( )	( )

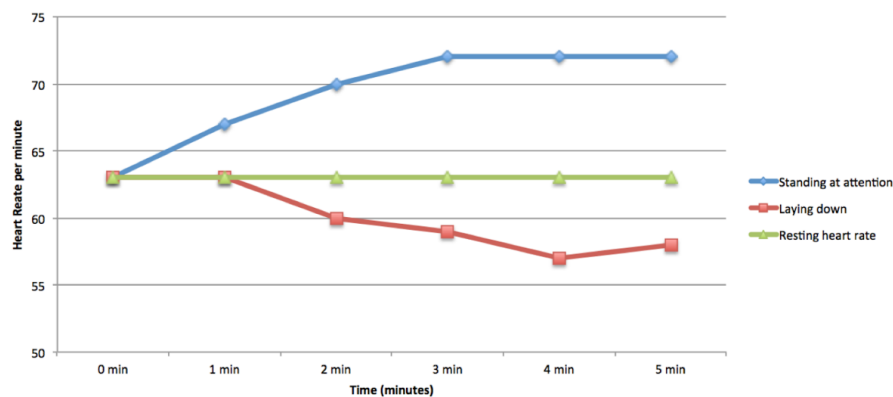
**6. Graph Set-up:** Be sure to label axes with units

Title: \_\_\_\_\_

**X axis, independent variable: time (minutes)**

**Y axis, dependent variable: heart rate/min**

**Draw a straight line to indicate resting heart rate**  
**Make sure the different activities are easily identifiable**



**7. Analysis:** These are complete sentences that highlight the information from the data tables/graphs. This would also include any statistical analysis (if done) as well as experimental uncertainty. In complete sentences start by identifying your **claim**, then **evidence for your claim** (with any statistical analysis) and finally the **reasons for this/these trends**. Remember reread your background and “because”. Follow by identifying any **experimental error** (not human error, you should have fixed that or repeated that part of the experiment).

**8. Conclusions:** A summary statement starting with, “Our data supports/does not support my hypothesis...” - if appropriate. Answer any prompts provided and what have you determined regarding the “Driving Question”. What could you do to reduced the experimental uncertainty?

1. How does your resting heart rate compare with the average for your sex? What might be the cause of the difference between your resting pulse rate and the average?
2. Why did you take a resting pulse rate?
3. Which activity had the greatest affect on the heart rate? Explain why you think this occurred.
4. What do you think is the relationship between physical condition and recovery time?