

Name _____ Date of Data Collection _____

Class Period _____ Lab Days/Period _____ Teacher _____

Pulse Rate Investigation Lab

(adapted from "Heart Rate Lab Activity" by James Buckley, Edwards-Knox High School;
<http://www.ekcsk12.org/science/lab/pulseratelab.html>)

Background: The circulatory system functions to deliver oxygen and nutrients to the tissues for growth and to remove metabolic wastes. The heart pumps blood through a circuit that includes arteries, arterioles, capillaries, venules, and veins. One important circuit is the pulmonary circuit where there is an exchange of gases within the alveoli of the lung. With increased exercise several changes occur within the circulatory system to increase the delivery of oxygen to actively respiring muscle cells.

Laboratory Safety Precautions: The following symbols represent the precautions that are required for this lab:



Purpose: The purpose of this laboratory experience is:

- to learn how to measure pulse rate
- to describe the relationship between changes in heart rate relative to changes in body position
- to describe the relationship between heart rate and exercise
- to determine cardiac recovery time.
- to graph individual data
- to perform statistical analysis on class data

PULSE RATE MEASUREMENT EXERCISE

The following series activities will involve some physical exertion in an attempt to study pulse rate relationships. CAUTION: Do not attempt these exercises in the physical activities could aggravate an existing health problem.

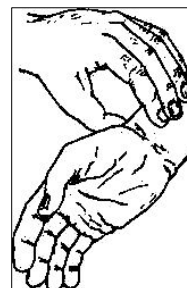
Materials: The following materials are needed to complete this laboratory experience:

- | | |
|-------------------------|------------------|
| stopwatch or watch with | pens and pencils |
| lab papers | graph paper |

Procedure: The following procedure is utilized to perform this experience:

Test 1: Standing Pulse Rate

1. The subject should stand at ease for two minutes.
2. At the end of this time take your partner's pulse. Count the number of beats for 30 seconds and multiply by 2. Record this data in the data sheet provided. Make sure NOT to use your thumb in taking a pulse.



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Test 2: Reclining Pulse Rate

1. Work in pairs. One partner, the subject, should recline for five minutes quietly on the laboratory bench.
2. The subject should remain quiet and reclining for the next test!! While staying reclined and quiet, the other partner should determine the subject's resting pulse rate. Record this data in the data sheet provided.

Test 3: Baroreceptor Reflex

1. The resting subject should now stand up.
2. At this time the other partner should immediately determine the subject's pulse rate. Record this data in the data sheet provided.

**** NOW REPEAT TESTS TWO AND THREE SWITCHING LAB PARTNERS.****

Test 4: Stress Test -- Endurance

1. The subject should do 30 pushups or 30 sit-ups in rapid fashion.
2. Immediately upon the completion of this exercise, measure the pulse for 15 seconds and multiply by 4. Measure the pulse rate every subsequent minute until the pulse rate returns approximately to the level observed in exercise one. Record all pulse rate values in reference to the time after exercise. The time needed to return to a resting pulse rate is called cardiac recovery time.

Data: The following data was collected during this laboratory experience:

Test	Count for 30 seconds	Pulse Rate (bpm)
Test 1: Standing Pulse Rate		
Test 2: Reclining Pulse Rate		
Test 3: Basoreceptor Reflex		
Test 4: Stress Test		
Pulse After Exercise		
Pulse After 1 minute		
Pulse After 2 minutes		
Pulse After 3 minutes		
Pulse After 4 minutes		
Pulse After 5 minutes		

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4. Explain why an athlete must exercise harder or longer to achieve a maximum heart rate than a person who is not as physically fit.

5. Explain why the pulse rate which is measured from an artery provides a heart rate measurement.

Bibliography of Images Used:

Possible Allergy Alert: <http://www.wpclipart.com/medical/sneeze.png>

In Good Health Caduceus Symbol: <http://www.wpclipart.com/medical/symbols/Caduceus.png>

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