

Teaching Suggestions

Science and Mathematics Lab

(Course 1, Lesson 2-8)

Measuring Heartbeat

OVERVIEW

In this activity, students will learn how to take and record a pulse. They will also measure and record a pulse for several minutes after physical exercise and graph the changes in pulse rate over time.

RECOMMENDED TIME

1 class period

MATERIALS

- clock or watch with second hand

PREPARATION

No special preparation is needed.

TEACHING THE LAB

1. Have students work in pairs. Students should be shown how to take their own neck pulse and then be able to take the neck pulse of another student.
2. Point out that the second and third fingers are best for taking a pulse. Make sure to explain *not* to use the thumb to take a pulse, since the thumb's own pulse will interfere.
3. On the graph of pulse rate versus recovery time, the line for each student should rise sharply to somewhere between 130 and 180 at one minute, and then gradually fall until it reaches the average pulse rate at rest.



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Measuring Heartbeat (continued)

Answers and Conclusions

1. Answers will vary. The measurements should *not* be exactly equal to each other, but both should be between 70 and 90.
2. Running speeds up the pulse.
3. Answers will vary according to student condition, but should take 6–8 minutes to return to normal.
4. Answers will vary according to student condition, but should take 6–8 minutes to return to normal.
5. Not necessarily; pulse rate depends on the student's physical condition, gender, fatigue level, and whether they have recently eaten.
6. No; a pulse rate of zero indicates the heart is no longer beating.

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Measuring Heartbeat

INTRODUCTION

Your heart is a powerful muscle that pumps blood throughout your body. It is a muscle that never rests. The force with which your heart contracts is so strong that by applying gentle pressure to your arteries you can feel the blood surging in these vessels. This regular surge of blood is your *pulse*. When you increase or decrease physical activity, your heart rate, as shown by your pulse, changes according to your body's needs.

OBJECTIVES

In this lab, you will:

- learn how to take your own pulse and that of your classmates.
- measure and record changes in pulse before and after physical activity.
- construct a graph of your information or data.

MATERIALS

- clock or watch with second hand

PROCEDURE

Part 1 Measuring the pulse at rest

1. Place your second and third fingers a few centimeters below your earlobe and slightly toward the front of your throat. Gently press in this area until you feel a pulse. This is the *carotid* (ka-RA-tid) artery, one of the major vessels that brings oxygen and blood to your brain.
2. Take a classmate's pulse for one minute. Record your results in Data Table 1.
3. Repeat this procedure three more times and find the mean of the results.
4. Let your classmate measure your pulse. Follow Steps 2 and 3. Record the results in Data Table 1.

Part 2 Changing the pulse

1. Ask your classmate to run in place for one minute.
2. Count and record in Data Table 2 your classmate's pulse each minute for eight consecutive minutes after he or she stops running.
3. Let your classmate measure your pulse for eight minutes after you run in place for one minute. Record the results in Data Table 2.

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Measuring Heartbeat (continued)

DATA AND OBSERVATIONS

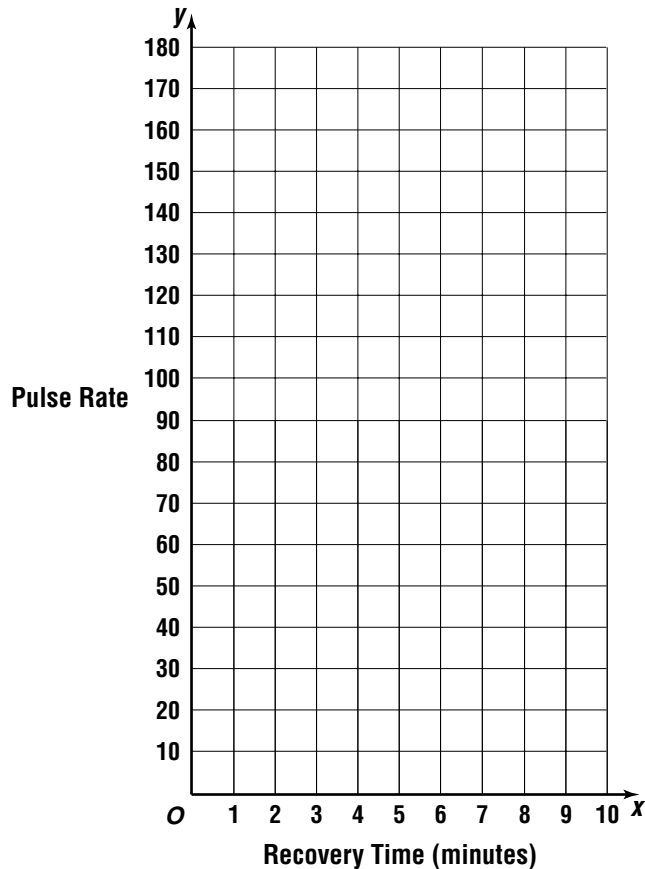
Data Table 1

Pulse/Minute	Trial 1	Trial 2	Trial 3	Trial 4	Average
Your classmate's pulse					
Your pulse					

Data Table 2

Minutes After Running	1	2	3	4	5	6	7	8
Your classmate's pulse								
Your pulse								

Make a line graph of your results from Data Table 2.



Questions and Conclusions

- How does your average pulse compare to your classmate's?
- How does running in place affect the pulse?
- How long after running does it take your pulse to return to the average in Data Table 1?
- How long after running does it take your classmate's pulse to return to the average in Data Table 1?
- Should your answers to Exercises 3 and 4 be the same? Explain.
- If you rested for 30 minutes after running, would you expect the pulse rate on the graph to approach zero? Explain.