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## Does Exercise Affect a Person's Heart?

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Lisa Englert

Science 7/8

Level I Lesson Plan: Incorporating Technology in the Science Classroom.

Connecting to NYS Standards

Standard 2: Information Systems

Students will access, process and transfer information using appropriate technologies.

Standard 4: Science Living Environment

Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical developments of ideas in science.

#5. Organisms maintain a dynamic equilibrium that sustains life.

Students will:

- \* describe the factors that help promote good health and growth in humans.

This is evident, for example, when students:

\*

analyze the extent to which exercise habits meet cardiovascular, energy and nutrient requirements.

## Respiration and Circulation Lab

Introduction: During an average lifetime, the human heart beats more than 2,000 million times and pumps 500 million l/110 million gallons of blood.

Objective: To recognize how the respiratory and circulatory systems help the body maintain homeostasis.

Essential Question: Does exercise affect a person's heart rate?

Materials: 1 Stopwatch per group, Exel program, 4 sets of 3# hand weights, 4 jump ropes.

Procedure:

1. Students will count off 1-7 forming 7 groups of 4.
2. Assign each group an exercise: sit-ups, jump rope, running in place, hand weights, walking and jumping jacks. One group will be a control at rest.
3. Each student in the group will perform the exercise for a total of 20 minutes, taking a pulse rate every 2 minutes and record.
4. Students are to enter the data onto an EXEL Spreadsheet. A summation of the "20 minute" data for the 4 students is then averaged.
5. A class data is added to spreadsheet by having the students post their averages on the board.
6. A bar graph is constructed and used to help in answering the Exploration Questions.

### Exploration Questions:

1. After a 20 minute period how much was heart rate increased?
2. Compare the heart rate your group obtained with the other 6 groups. Which exercise caused heart rate to increase the quickest?
3. Explain (using terms/phrases: O<sub>2</sub> debt, CO<sub>2</sub> build-up, and lactic acid build-up) why heart rate increases quicker for some exercises than for others.
4. Bonus Question: On average, whose heart rate beats more per minute, males or females? Why?

Grading: 45 total points—plus a possible 5-point bonus.

Points:	Task:
5	Performing exercise for 20 minutes
5	Obtaining pulse rate every 2 minutes for 20 minutes
20	Creating a spreadsheet displaying: (a) individual data every 2 min for 20 min (b) group average (c) class data
10	Bar graph displaying class data
1	Exploration 1
1	Exploration 2
2	Exploration 3
5	Bonus Question