Name/Title: Pump it Up!

Purpose of Event: 1. The student will describe the process by which blood is circulated throughout the body. 2. The student will explain the effects of exercise on the heart. 3. The student will, using class results, develop a histogram of pulse rates.

Suggested Grade Level: 6-8

Materials Needed: Basketball court/blacktop/other large room, 20-30 small traffic cones or beanbags (1 per student), 4 1-quart jugs of water,drum and mallet, paper and pencil for each student.

Description of Idea

Preparation:

Prior to class, arrange cones/beanbags on the floor in the shape of a "Gingerbread man." One cone should be placed in the center of the "chest" to represent the heart. Enough room is provided for students to run in place without touching each other. However, they must be close enough that they can hand the jugs from one person to the next.

Procedures:

1. Introduce the lesson by explaining that students will be reviewing how the heart and circulatory system work. Ask the following questions:
a. What does the circulatory system do?
b. How is the heart like a pump?
c. What does your pulse rate tell you?
d. What effect does exercise have on your
pulse rate?
2. Have each student find their carotid pulse and calculate his/her resting pulse rate.
3. Tell each student to stand at one of the cones/beanbags so that they straddle the equipment. They should have paper and pencil with them, but place them on the ground out of the way.
4. Explain that students will perform different exercises depending on the drumbeat. After each exercise, students are to once again take their pulse and record the results.
5. Beat the drum slowly and tell students to walk in place. Continue for one minumte, then have students stop and record pulse rate.
6. Repeat the above twice more, increasing the drumbeat each time. For a medium rhythm, have students jog in place; for fast rhythm, have students run in place. Other exercises may be substituted depending on available space. After each exercise, students record their pulse rates.
7. Explain that the heart is capable of circulating a gallon of blood in about one minute.
8. Place the four jugs of water at the feet of the student representing the heart. At your signal, that student picks up one jug and passes it to a student on the left of the body closest to him/her.

Repeat the process as quickly as possible until all four jugs have been distributed. Students continue passing the jugs around the body until they all return to the heart. Students try to circulate the jugs in less than a minute.
9. If time permits, allow students to repeat the above activity. As they improve, so will the time it takes to pass the jugs. The analogy is that as exercise improves the heart, it becomes more efficient in circualting the blood.
10. Ask students to get in groups of 4-6 and record pulse rates from each activity (including resting pulse rate) for the group. Students are to develop a histogram using those results. Collect results from each group.

Assessment Ideas:

Provide data of pulse rates for the entire class for each activity performed. Each student is to develop a histogram using that data. Ask students to explain why the results varied according to the exercise performed, and to describe the peristaltic movement of the veins and arteries.

Teaching Suggestions:

Depending on the physical capabilities of the students, they may do jumping jacks (leg movements only) as they pass the jugs. The student who passes the jug should have both feet together, and the student receiving the jug should have his/her feet apart. This represents the peristaltic movement of the arteries and veins as they circulate the blood.

Submitted by **Dr. Edith Ellis** who teaches at College of Charleston in Charleston, SC. Thanks for contributing to PE Central! **Posted on PEC: 4/28/2004**.