

Suggestions for Teachers

Blood Flow and Elvis

Purpose

Explore further the factors that affect blood flow via a hands-on, inquiry-based laboratory experiment.

Objectives

Students will be able to:

- Make active observations about how the diameter of a tube affects the flow rate of a fluid through the tube.
- Demonstrate skills in the scientific method of developing experimental questions, designing experiments, collecting and analyzing data, and drawing conclusions.

Materials for each group

- Three different straws of varying radius (ex. drinking straw, coffee stirrer (one chamber), cocktail straw, etc.)
- Liquid for drinking (ex. water, juice, Kool-Aid®)
- Milliliter measure, up to 250mL, that can be used for measuring drinking liquids (ex. plastic beaker, measuring cup)
- Plastic cups
- Stopwatch
- Elvis Letter handout
- Metric ruler
- Graph paper

Procedure

- Prepare materials ahead of time.
- Divide class into working groups of 2-4 students.
- Read the Elvis letter and explain the research question.
- Have each group design their experiment and get approval from you before starting.
- Each group should present their results in the form of a graph or table. If desired, have each group present a poster to explain their hypothesis, methods, results, and conclusions and present it to the class.
- Results should be shared with the class. From the findings of your class, go on to discuss atherosclerosis and Coronary Artery Disease (CAD).

Safety

- The teacher must approve experimental designs before groups can begin.
- Take normal laboratory precautions.
- This lab involves students drinking liquids. Equipment (cups, straws, measures) should be used directly from the packaging or thoroughly washed with hot water and dish soap before use (preferably in a dishwasher). If using a liquid other than water, check for allergies or dietary restrictions.

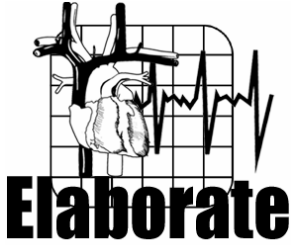
Suggestions for assessment

Groups can write a complete laboratory report or make a poster. The students in each group should participate in presenting their experiments, results, and conclusions either orally or by a poster. Develop a rubric for evaluation of group activities.

References and Resources

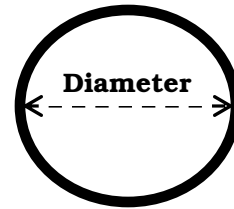
Textbooks on anatomy and physiology.

Student Name: _____



Student Activity Sheet Elvis Experiment

Let's help out Elvis!



1. Read the letter from Jon Burrows.
2. Based on the information in the letter, design an experiment to determine the relationship between the diameter of a blood vessel and blood flow. You can use the materials listed below for your experiment.
3. In your experimental design, describe the method you will use in words and/or diagrams. Hint: Units count!
4. Get your teacher's approval of your experimental design BEFORE you start the experiment.
5. Conduct your experiment.
6. Record your results – include numbers or a graph that describes your results.
7. Write down your conclusions. How can your findings help Elvis understand how his diet can make his heart have to work harder to circulate his blood?

Materials

- Straws
- Liquid for drinking
- Milliliter measure
- Plastic cups
- Stopwatch
- Graph paper
- Metric ruler

Note: You may or may not need all of these materials!