



EXPLORING A HEART ATTACK

STEAM Activity


The American Heart Association recognizes the importance of building healthy bodies and minds. This lesson is an introduction into combined concepts of Science, Technology, Engineering, Arts and Math; better known as STEAM.

Objective:

Students will be introduced to the concept of a heart attack through building a simulation of blockage in the arteries.

Materials Needed:

 Tape

 8.5 x 11 sheet of paper

 Small candies like Skittles or M&Ms

 2 magnets

 Paper clips

Resources:

- [About heart attacks](#)
- [Warning signs of a heart attack](#)

Overview:

Your heart muscle needs oxygen to survive. A heart attack occurs when the blood flow that brings oxygen to the heart muscle is severely reduced or cut off completely. This happens when coronary arteries that supply the heart muscle with blood flow become narrowed from a buildup of fat, cholesterol and other substances that together are called plaque. This slow process is known as atherosclerosis. When plaque within a heart artery breaks, a blood clot forms around the plaque. This blood clot can block the blood flow through the artery to the heart muscle.

Think of blood flow like water flowing through a stream. They both deliver vital nutrients to living things downstream. If a beaver were to build a dam (blockage), the plants receiving the water would suffer and wilt (weaken). If a log were to get stuck in the dam and block all flow, the plants would die. Similarly, blood delivers nutrients to muscle cells in the heart. If a blockage forms, flow decreases or the flow stops, causing a heart attack.

Instructions:

1. Learn about the heart and how blood flows with the [3-D model](#).
 2. Show what happens during a heart attack using these resources:
 - [What is a heart attack?](#)
 - Blockage Forming Animation: [Animation Videos](#)
 3. Conduct the activity.
 4. Host a class discussion.
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Post Activity Group Discussion:

- What represents atherosclerosis in this example?
- What represents the clot in this analogy?
- What represents the red blood cells in this example?
- How would you describe the changes in speed, sound and smoothness of movement in the candies as the “clot” forms?
- How many paper clips did it take to stop the flow completely? Compare to other groups.
- What can cause a heart attack?
- What are signs of a heart attack?
- What can we do to help prevent heart attacks?



Exploring a Heart Attack

Student Name: _____ Class: _____ Date: _____

1. Roll the paper into an 11.5-inch tube the diameter of one paper clip. Tape the tube to hold it in the cylinder shape.
2. Hold the tube at about a 30-degree angle.
3. Have one person roll 10 candies down the tube. Notice the sound and how smoothly and quickly the candies slide through the tube.
4. Hold one magnet near the center of the outside of the tube on the bottom. Slide candies and the second magnet through the inside of the tube. Try to “catch” the second magnet on the way through the tube.
5. After the second magnet is stuck inside the tube and held in place by the first magnet on the outside of the tube, continue to slide the candies through the tube. Notice the sound and the speed of the candy traveling through the tube.
6. Add a paperclip around one piece of candy. Continue to slide the candies through the tube. Observe what happens to the paperclip candy piece. Observe the change in sound and speed of the candies traveling down the tube each time.
7. Repeat step 6 until there are enough paper clips stuck that the candy does not flow anymore.

FACTS ABOUT YOUR HARDWORKING ARTERIES:

- Arteries carry oxygen-rich blood from your heart to the rest of the body.
- Arteries are found all over the body, from the brain to the toes. Healthy arteries are smooth on the inside so blood can flow easily through them.
- Sometimes arteries get clogged by a substance called plaque. Plaque is created from different substances that can be in the blood, such as fat and cholesterol. It can build up on the walls of arteries. It reduces the flow of blood and can even block an artery.
- A person with clogged arteries has a greater chance of having a heart attack or a stroke. Both of these health events can cause death.
- Healthy habits—such as eating healthy foods, getting regular physical activity, and avoiding cigarettes and vaping—can help keep arteries healthy.

