

Lesson 3 – Be the Beat®: Imagining the Future

Lesson Description: Students will imagine a future technology that will help save lives during cardiac emergencies.

Curriculum Connections: problem-solving, engineering, science, technology, mathematics

National Health Education Standards:

Students will:

- learn concepts related to health promotion and disease prevention to enhance health; and
- analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.

Health Intended Learning (objectives):

Students will:

- understand the issue of cardiac arrest (CA);
- understand that new medical technologies, programs, and systems could be created to help save more lives during incidents of CA;
- understand how advances in technology have positively affected human health and longevity;
- recognize that there are medical needs and health issues that cannot be solved with current technology, which could, in the future be solved by advanced technology; and
- consider how future technology could further help save lives and improve heart health.

STEM Intended Learning (objectives):

Students will:

- explore the role of science and technology in solving medical and health issues;
- consider the design and function of a device that could solve a heart-health issue; and
- use their knowledge of technology, science, and mathematics to create sketches, drawings, descriptions, and models of technological designs.

Class Time: 60 minutes

Materials:

- **Problem/Solution Brainstorming** handout
- access to computers and the Internet

Launch (Anticipatory Set):

Discuss or review with students:

- CA kills 300,000 people each year.
- Eighty percent of these incidents occur at home.
- Less than one third of CA victims receive CPR before EMS arrives.
- Immediate CPR and Hands-Only™ CPR are critical in saving lives because within minutes, irreversible brain damage or death may occur.

Explore/Activity:

- Have students research medical technologies such as CPR science, AEDs, stents, personal defibrillators, etc. and create a timeline of those technologies and how they have impacted heart health and helped save lives.
- Then have students brainstorm issues that still need solutions and imagine a technology that might provide one. For instance, have students consider issues such as the ability to quickly locate and access the nearest AED or finding a person who is trained in CPR during an emergency. Possible solutions include: creating an app that finds the nearest AED or CPR-trained person in the event of a cardiac emergency (eg, mapping software that includes AED locations as points of interest).
- Have students use the **Problem/Solution Brainstorming** handout to sketch out their ideas for future technology through both drawing and verbal description.
- Then have students write a brief description of CA and how their solution will save lives in a CA emergency.

Summary:

Discuss with students:

- Although medical technology (such as AEDs) and CPR methods have improved and have helped save many lives, there is still room for improvement.
- Technology can play an important role in saving more lives.
- There are future, creative solutions that could provide more people with access to an AED or lifesaving CPR within the critical first minutes after CA.

Assessment:

Students show proficiency by describing CA and creating or illustrating a possible solution.

Extensions:

- Create a model or “prototype” of the device from clay or other sculpting materials.
- Use a computer to create a 3-D image or drawing of the technology/device.
- Write a press release announcing their invention and how it will help people.

Resources:

- CPR Statistics (http://www.heart.org/HEARTORG/CPRAndECC/WhatisCPR/CPRFactsandStatistics_UCM_307542_Article.jsp#.TsgRefLSxVg)
- Cardiac Arrest Resources (http://www.heart.org/HEARTORG/Conditions/More/CardiacArrest/CardiacArrest_UCM_002081_SubHomePage.jsp)
- Cardiac Inventions (<http://inventors.about.com/library/inventors/blcardiac.htm>)
- Be the Beat (<http://www.bethebeat.heart.org/>)

Problem/Solution Brainstorming

What is the problem?

What is the possible future solution?

What materials are needed to construct or create the device/technology?

Draw what the device or technology would look like:

A large, empty rectangular box with a thin orange border, occupying the lower half of the page. It is intended for drawing a device or technology as described in the text above it.