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 sudden cardiac arrest (SCA);
- understand that new medical technologies, programs, and systems could be created to help save more lives during incidents of SCA;
- 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:

- cardiac arrest (SCA) kills 300,000 people each year.
- 80% of these incidents occur at home .
- Less than 1/3 of SCA victims receive CPR before EMS arrive.
- Immediate CPR and Hands-Only$_{TM}$ CPR are critical in saving lives because the brain starts to die within 4 minutes of SCA—and after 10 minutes, the damage is irreversible.

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.
- Have students visit the Be the Beat! website and view the AED game to learn about using an AED in an emergency.
- 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 a cardiac arrest (E.g., mapping software that includes AED locations as “points of interest”.)
- Using the **Problem/Solution Brainstorming** handout, have students sketch out their ideas for future technology through both drawing and verbal description.
- Then have students write a brief description of SCA and how their solution will save lives in an SCA 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 SCA.

Assessment:

Students show proficiency by describing SCA 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/Cardiac-Arrest_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: