Activity 1: Explore “Cure it!” Inventions

Introduction

Many inventions have been used in the medical field and have changed the mainstream practice of medicine (e.g., X-Ray imaging, prosthetic limbs, antibiotics). These inventions have greatly extended the ability of physicians to diagnose and treat diseases, making great contributions to health and quality of life. In this activity, you will learn about some examples of the “Cure it!” inventions that develop and utilize innovative technology to help people. Some of the inventions were made by people your age! We hope their stories can inspire you to invent something to help cure people!

Activity Instructions

Explore the following “Cure it!” inventions created by students. Think about these questions:

a. What problems do these inventions address? Who will benefit from these inventions?

b. Think about how these inventions help address bigger challenges. We have added the alignment with the NAE’s Grand Challenges for Engineering (GCE) and the UN’s Sustainable Development Goals (SDG) for these inventions in the table below (the fourth column labeled “Alignment with GCE or SDG”).

- You can check the Grand Challenges for Engineering and the Sustainable Development Goals for more information about the big challenges we face.

c. Do your friends, neighbors, or members of your community have similar problems? How can some of these inventions be modified or changed to meet the needs of people in your community?

Invention name (and inventors)	What does the invention do?	Resources for exploration	Alignment with GCE or SDG
Method to Design a Better Prosthetic Foot	A new design method for a low-cost, high-	The Lemelson-MIT Student Prize introduction of the	SDG 10.2: By 2030, empower and promote the social,

(Katy Olesnavage, MIT; 2017 Lemelson-MIT Student Prize Graduate Winner)	performance prosthetic foot that better replicates physiological gait kinematics, enabling persons with amputations to walk more naturally. Katy's work is a redesign of the Jaipur Foot.	invention (this page includes the fact sheet and an introduction video of Katy's invention). Katy's presentation at Lemelson-MIT EurekaFest	economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion, or economic or other status.
Microneedle pill (mPill) and Ultrasound Probe (uProbe) (Carl Schoellhammer, MIT; 2016 Lemelson-MIT Student Prize Graduate Winner)	A microneedle pill is a pain-free biologic drug delivery device. After you easily swallow it, the pill injects medicine directly where it needs to be. The uProbe uses ultrasound to physically drive medication into tissue in the GI tract safely and painlessly.	The Lemelson-MIT Student Prize introduction of the invention (this page includes the fact sheet, an introduction video of the invention, and Carl's presentation at Lemelson-MIT EurekaFest event). Carl's introduction invention video. Carl's inventions have been commercialized as Suono Bio.	GCE: Engineering can enable the development of new systems to use genetic information, sense small changes in the body, assess new drugs, and deliver vaccines to provide health care directly tailored to each person.
System consisting of a wireless stethoscope and self-cleaning carrying case. Useful for telemedicine as well as preventing communicable	A wireless, handheld stethoscope unit to facilitate digital recording and transmission of patient breathing and heart rate signal. The	The InvenTeam blog	GCE: Advance Health Informatics

diseases in clinics. (Fairview High School InvenTeam, Fairview, PA; 2018 Lemelson-MIT InvenTeam grant recipient)	stethoscope is carried by health care providers in a portable sanitizing case that irradiates 99.9% of present bacteria after exposure to 265 nm UV lights over 60 seconds.		
Heart & Sole (Garey High School InvenTeam, Pomona, CA; 2018 Lemelson-MIT InvenTeam grant recipient)	A device that allows individuals with diabetes to monitor foot health at home, especially for settings without regular doctor access.	The InvenTeam blog	SDG 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.