

Activity 1: Explore “Move it!” Inventions

Introduction

Do you think self-driving cars will replace our current transportation in the future? Are you curious about what is involved in self-driving cars?

Have you heard about the USA’s [Mars Exploration project](#) and the Mars rovers? Do you want to know why the Mars rovers can move on Mars?

Do you know how the police determine whether a driver is under the influence of drugs or alcohol?

Many of these questions can be answered with “Move it!” inventions, technology-based inventions that involve transportation or mobility. In this activity, you will explore a few “Move it!” inventions and see how these inventions help improve people’s mobility. Have fun exploring these inventions and thinking about what you might want to invent!

Activity Instructions

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

- a. What is interesting about these inventions?
- b. What problems do these inventions address? Who will benefit from these inventions? Do you think you or members of your community can benefit from these inventions?
- c. 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.
- d. Does your local community have similar problems? How might we modify or change some of these inventions to make them useful to your community?

Invention name (and inventors)	What does the invention do?	Resources for exploration	Alignment with GCE or SDG
<p>CARduino</p> <p>(Josh Siegel, MIT; 2015 Lemelson-MIT Student Prize Graduate Winner)</p>	<p>A plug-and-play software and hardware system that enables users to access real-time data from their car's hundreds of sensors and actuators, connecting this data to a Cloud platform to make system-level improvements of navigation, safety, and efficiency in transportation.</p>	<p>The Lemelson-MIT Student Prize introduction of the invention (the page includes an introduction of the invention, invention fact sheet, an introduction video, and a video of Josh's presentation at the EurekaFest event)</p>	<p>SDG 11.2: By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.</p> <p>GCE: Restore and Improve Urban Infrastructure.</p>
<p>WheelSense: An Open-Source Smart Add-On System for Wheelchairs</p> <p>(Tomás Vega and Corten Singer, undergraduate students from University of California, Berkeley; 2017 Lemelson-MIT Student Prize Undergraduate Team Winner)</p>	<p>Open-source smart add-on for wheelchairs. Additional sensing and warning capabilities to know where ramps and curbs are.</p>	<p>The Lemelson-MIT Student Prize introduction of the invention (this page also includes an invention fact sheet)</p> <p>The WheelSense introduction video</p>	<p>SDG 11.2: By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.</p>

			GCE: Restore and Improve Urban Infrastructure.
<p>Device to Prevent Biodiesel from Gelling at Low Temperatures</p> <p>(Energy Institute High School InvenTeam, Houston, TX; 2018 Lemelson-MIT InvenTeam grant recipient)</p>	<p>Biodiesel is often mixed with regular diesel fuel because at cooler temperatures the 100% biodiesel begins to gel and combustion becomes less efficient or doesn't happen at all. This mechanical device and feedback system keep the viscosity at the correct level.</p>	<p>The InvenTeam blog</p>	<p>SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.</p>
<p>Detection and Alert System for the Blood Alcohol Content of Drivers</p> <p>(Kealakehe High School InvenTeam, Kailua-Kona, HI; 2018 Lemelson-MIT InvenTeam grant recipient)</p>	<p>A device to measure blood alcohol content through skin contact on a car's steering wheel. This device also connects to an alert system to notify a support network if a driver is putting others in harm's way.</p>	<p>The InvenTeam blog</p>	<p>SDG 11.2: By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.</p>
<p>Device to Extend Gas and Brake Pedals in Standard Cars</p>	<p>This aftermarket device quickly extends the length of car pedals to support driving and</p>	<p>The InvenTeam blog</p>	<p>SDG 11.2: By 2030, provide access to safe, affordable, accessible, and sustainable</p>

<p>(Pingree School InvenTeam, South Hamilton, MA; 2017 Lemelson-MIT InvenTeam grant recipient)</p>	<p>independence for people with dwarfism.</p>		<p>transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.</p>
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