Activity 1. Explore “Eat it!” Inventions

Introduction

When you hear the word “invention” or “inventor,” what comes to your mind? Thomas Edison and light bulb? Or Steve Jobs and iPhone? Do you know that inventions do not need to be revolutionary? Instead, most of them are small improvements that make people’s lives easier, more convenient, and more comfortable. The “Eat it!” inventions are great examples of this—they are inventions that involve food, water, or agriculture. In this activity, you will explore a few “Eat it!” inventions that utilize technology to help with agriculture, ranging from restaurant to hydroponics to dairy farming. You will first learn about the inventors, what problems they solved, and how they came up with their invention ideas. Then you’ll brainstorm what you may want to invent to help with food or agriculture!

Activity Instructions

Explore the following “Eat 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
Bioregenerative Life Support Systems (BLiSS) (Heather Hava; 2016 Lemelson-MIT Student Prize Graduate Winner)	Robotic technologies to support growing fresh food during space exploration.	The Lemelson-MIT Student Prize introduction of the invention YouTube Motherboard channel: a 10-minute, well-produced feature of Hava's invention Hava's presentation at Lemelson-MIT EurekaFest	SDG 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists, and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.

Spyce Kitchen: The World's First Completely Automated Restaurant (a group of MIT undergraduate students; 2016 Lemelson-MIT Student Prize Undergraduate Team Winner)	Spyce Kitchen cooks and serves delicious meals from fresh ingredients in less than five minutes with absolutely no human involvement. The team's invention includes a refrigerator, dishwasher, stovetop and chef, all in one machine, uses an array of sensors to accurately control temperature and quality when cooking and is self-cleaning. Spyce Kitchen was invented because there was no access to healthy, cheap, fast food on campus.	Website of Spyce Kitchen restaurant The group's presentation at Lemelson-MIT EurekaFest How the Robotic Kitchen at Spyce in Boston Actually Works	SDG 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious, and sufficient food all year round.
Smart Nutrient Additive System (SNAS) (Nation Ford High School InvenTeam, Fort Mill, SC; 2019 InvenTeam grant recipient)	A liquid chemical nutrient injector system designed for hydroponic farmers to automate the nutrient injection process and eliminate excessive time and chemical waste spent from manually remixing nutrient solutions for hydroponically	The InvenTeam blog Video of the team's midterm technical review	GCE: Engineers can help restore balance to the nitrogen cycle with better fertilization technologies and by capturing and recycling waste. SDG 2.3: By 2030, double the agricultural productivity and incomes of

	grown plants.		small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists, and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.
Detector of Lameness in Dairy Cattle (CATALYST at the Science House InvenTeam, Raleigh, NC; 2018 InvenTeam grant recipient)	A device to detect lameness in dairy cattle—an indicator of overall bovine health. The device consists of four stainless steel scales for each of the cow's legs to stand on.	The InvenTeam blog	SDG 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists, and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and

			non-farm employment.