

OUT-OF-SCHOOL SETTINGS | GRADES 6-8

Plants to Plastics: Engineering Bioplastics

Unit Overview

Think twice before you throw away that plastic spoon! Look around you— how much plastic do you see? The world is filling up with plastics that aren't biodegradable. Youth participating in this unit learn about bioplastics, a possible solution to the plastic problem. They then use each step of the Engineering Design Process as they become chemical engineers and design their own bioplastics.

Engineering Application/Unit Goals

In this unit, youth explore problems created by traditional plastic materials and engineer bioplastics—plastics made from plant-based materials— as a potential solution to current plastic problems. Chemical engineers use their knowledge of math and science, particularly chemistry, to solve challenges related to biotechnology and chemical production. Polymers are a common material found in nature and designed by chemical engineers. Youth will learn about the properties of different polymers, then create and improve bioplastics that can be used in similar applications as traditional plastic materials.

Engineering Everywhere inspires learners in grades 6-8 to shape the world around them. Our twelve hands-on units were tested in afterschool, summer camp, and out-of-school time settings, and they are proven to engage learners in innovative problem solving. Each unit begins with a Special Report video, which sets the context for the engineering design challenge and explores problems like food scarcity, prosthetics, and disease control. As learners work through our design challenges, they'll sharpen 21st century skills like critical thinking, teamwork, and communication, preparing them for success in school and in life.



Unit Map

Prep Activity 1: What is Engineering?

Youth are introduced to engineering as they work in teams to engineer a catapult from a plastic spoon.

Prep Activity 2: What is Technology?

Youth learn about technology through a series of interactive games that explore the definition of technology.

Activity 1: Bouncy Polymers

Youth engineer a bouncy ball out of glue and borax and model the chemical structure by forming a human polymer.

Activity 2: Plastic Exploration

Youth explore different types of plastics in their environment and investigate some problems created by plastics.

Activity 3: Investigate Bioplastics

Youth create bioplastic samples out of agar and cornstarch.

Activity 4: Create Bioplastics

Youth engineer a bioplastic with properties similar to a plastic that they use in their daily lives.

Activity 5: Improve Bioplastics

Youth will engineer a bioplastic object using an improved recipe.

Activity 6: Engineering Showcase

Youth communicate their work with visitors.

Ready to create a generation of problem solvers? Contact sales@mos.org