

“Design Your Own Harvester!”

Level: 3rd grade

Time: 4-5 class periods

Core Standards: [CCSS.ELA-Literacy.RI.3.7](#), [CCSS.ELA-Literacy.SL.3.1.c](#), [CCSS.ELA-Literacy.SL.3.1.d](#), [CCSS.ELA-Literacy.SL.3.4](#), [CCSS.ELA-Literacy.RST.6-8.7](#)

Overview: This lesson explains the importance of engineering in agriculture. Through an engineering activity, students will research a specific crop and design a harvesting machine that won't harm the plants. This activity includes group communication, research and engineering skills.

Concept: Understand the importance of engineering in agriculture.

Objectives:

- Students will learn that there are different types of harvesting equipment designed for specific crops.
- Students will understand that engineers design harvesting machines to work without damaging the plants.
- Students will explain why engineers play an important role in agriculture.

Materials:

- Research materials about different types of plants (school library and computers, books about plants, classroom library, community library and computers)
- Paper and pencils
- The Casey & Friends book, *Combines**

Procedure:

Introduction: Explain to students that science and math skills are used in many different professions. For example, engineers use these skills to design farm equipment that keeps soil healthy while producing crops. Look at the blue print spreads in the book, *Combines* (pp. 14-17). Explain that engineers create combines to separate and store the part of the plant that is used. And combines are specially designed to harvest plants without damaging the plants in the harvesting process. Turn to pages 26 and 27 in *Combines* and look at the different types of harvesting equipment. Ask students what they notice about these machines. (Responses should include that they all look very different from one another.) Explain that agricultural engineers design equipment based on how a crop is harvested and how the equipment moves through the fields and over the soil.

Learning Activity: Students will design their own harvesting equipment based on their research about a specific plant/crop.

1. Divide students into pairs or small groups.
2. Have each group pick a plant that will be harvested by their machine. Some examples are: rice, cocoa beans, sunflower seeds, bananas, etc. Really, anything they can think of that is grown and harvested will work!
3. Have groups research their plants. Write these guiding questions on the board: Things to consider about your plant: Where does your plant grow—in a flat field, on a tree, in a bush, on a mountain, etc.? Do your plants grow close together or are they spread far apart? What part of your plant is used—is it the seeds, the whole plant, the fruit?
4. Using their research notes, have groups design a harvesting machine for their specific plant. Write these guiding questions on the board: Things to consider about your machine: How will your machine harvest the plant without damaging it? How will it move over the soil without sinking? What will it do with the part of the plant you want to save? What will it do with the part of the plant that you don't use?
5. Using the guiding questions from step 4, have each group present its harvester to the class and explain why they designed it the way they did.

Additional Learning Opportunity: If you have the time and access to materials, have students create their harvesting machine. Materials can include: paper clips, pipe cleaners, toilet paper/paper towel rolls, duct tape, construction paper.

* If you do not have the book, *Combines*, you can still use this lesson plan! You won't be able to show the inside design of a combine, but you can still show images of different types of harvesting equipment. (Online resources are the easiest way to gather these images.)