

Evaluating GMO Perspectives Online Module

In this lesson you will learn about transgenesis, a technology used to genetically modify crops. With a basic knowledge of the technology you will learn what crops in the United States have been genetically modified, why a farmer might choose to grow a GM crop, and evaluate how social science impacts the implementation of the technology in our food supply.

1. As you walk through the grocery store, you will see countless food labels that say “non-GMO.” There are several methods that plant scientists can use to alter or shift the genetic characteristics of a plant. However, these labels are typically referring to a scientific process called transgenesis. Transgenesis is the process of moving a gene from one organism into another unrelated organism. This scientific process is regulated by the USDA, FDA, and EPA to be sure that seeds developed through transgenesis do not present challenges or risk to the environment or our food supply. Visit [this website](#) to discover the 10 GMO crops that are currently available on the market and list them below:



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2. Now you know which 10 crops in the United States have an approved variety of seed available on the market for farmers to purchase and grow. Keep in mind that some farmers grow crops that don't even have GMO varieties developed and other farmers choose not to grow GMO seed varieties for various reasons. With this in mind, imagine yourself walking through a grocery store and noticing how many “non-GMO” labels can be found on different types of food. Use your critical thinking skills and what you have just learned about the 10 genetically modified crops available in the United States and complete the [GMO?...Or No?](#) Quizziz. You will be seeing a series of food packages. Every package contains a “non-GMO” label. Study the food and the ingredient list to determine if that food could actually contain genetically modified ingredients. Select *yes* or *no* for each food. Before you begin, note that

sugar can come from sugar cane or from sugarbeets. Sugar cane has not been genetically modified, but sugarbeets have. Some food labels indicate their source from cane sugar, and others are not specific.

- a. What was your final score?*
 - b. After completing the quiz, reflect on food labels. Do all “non-GMO” labels have value by separating one seed variety selection (a GM variety) from another (non-GM)? Explain your thoughts and reasoning.*

3. Watch the video [How Are GMOs Created?](#) This video clip uses the example of the papaya to describe the process of creating a genetically modified plant.
 - a. What was the name of the disease that was destroying the papaya trees?*

4. Watch the video, [The Unpopular Facts about GMOs](#). This video uses terminology and comparisons that will be very familiar.
 - a. Brian Dunning describes that direct genetic modification (transgenics) is a technology. He names two other technologies that can also be used to improve plants. What are they?*

5. Why might a farmer choose to grow a genetically modified crop? Watch the video, [Evaluating GMO Perspectives](#) (0:00-5:40)
 - a. What are some of challenges genetically modified plants help overcome? List 3 or more.*

- b. *If you were a farmer and had the option to grow a genetically modified seed variety, would you choose to? Why or why not? (Remember genetic modification is only 1 tool that can be used to overcome specific challenges in farming.)*

6. Considering Perspectives. Continue watching the [Evaluating GMO Perspectives](#) video (5:40-11:34)

- a. *Describe in your own words the difference between biological and social science.*



- b. *While thinking about the analogy of the beach ball and how everyone has different perspectives and points of view, what is yours? As a consumer, what is your perspective on using genetic modification to improve agricultural crops and to overcome challenges?*

7. Watch a clip from the video, [What is a GMO?](#) (Video should start at 2:15) Keep in mind what you learned in *Step 6* about the difference between biological science and social science as you learn more about the story of Golden Rice.

- a. *What important nutrient did Golden Rice contain?*

- b. *Why was Golden rice rejected by the people it was designed to help?*

8. In summary, review the following:

Key Points:

- Transgenic technology is one tool that may help address challenges in food production (e.g., drought, pests, and disease) to meet the growing demand for food.
- GM crops can increase crop yields (harvest) due to decreased crop loss from pests, disease, and drought.
- Although significant research is performed to evaluate the safety of GM crops for consumption as well as to assess the potential for harm to the environment, some consumers remain concerned by the social and economic issues related to increased use of biotechnology and GM crops.
- The discussion on GM crops can be viewed from many perspectives (e.g., farmers, consumers, scientists, nutritionists).