

**Lab Activity Title:** Genetically-Modified Foods  
**Submitted by:** Karen McCabe  
**Recommended Grade Level:** Grade 8  
**Discipline:** Life Science/Health  
**Time Requirements:** Three 90 minute blocks or five 60 minute blocks

**Required Materials:**

A variety of genetically and non-genetically modified foods, attached handouts, computers with internet access, projector

**National Science Standards Alignment**

**Life Science Standards**

**Standard 4: Understands the principles of heredity and related concepts**

2. Knows ways in which genes (segments of DNA molecules) may be altered and combined to create genetic variation within a species (e.g., recombination of genetic material; mutations; errors in copying genetic material during cell division).

**Standard 7: Understands biological evolution and the diversity of life**

1. Knows that heritable characteristics, which can be biochemical and anatomical, largely determine what capabilities an organism will have, how it will behave, and how likely it is to survive and reproduce. 3. Knows how variation of organisms within a species increases the chance of survival of the species, and how the great diversity of species on Earth increases the chance of survival of life in the event of major global changes.

**Health Standards**

**Standard 2: Knows environmental and external factors that affect individual and community health**

2. Knows how individuals can improve or maintain community health (e.g., becoming active in environmental and economic issues that affect health, assisting in the development of public health policies and laws, exercising voting privileges).

3. Understands how the environment influences the health of the community (e.g., environmental issues that affect the food supply and the nutritional quality of food).

4. Understands how the prevention and control of health problems are influenced by research and medical advances.

5. Knows how public health policies and government regulations (e.g., OSHA regulations, Right to Know laws, DSS regulations, licensing laws) impact health-related issues (e.g., safe food handling, food production controls, household waste disposal controls, clean air, disposal of nuclear waste).

*\*Note: This lab activity was submitted to Ward's Science by a third party educator for the sole purpose of sharing content and ideas with other educators. Ward's Science is not affiliated with the author of this lesson plan. All product recommendations made by Ward's Science are suggestions for completion or extension of the activity or topics addressed, but are not required to complete the activity.*

\*8<sup>th</sup> grade students in Worcester County Public Schools spend the 3<sup>rd</sup> term of each school year studying cells and heredity. This unit will be introduced after the instruction relating to heredity has occurred.

**Background Information:** Students should be aware of the basic structure and function of DNA, Mendelian genetics and heredity. Teacher should be able to name several examples of genetically modified foods and explain the basics of gene splicing. Teacher should also have prior knowledge of the risks and benefits of genetically modified foods.

The following resources will provide more detailed background information if needed:

- [What is Genetic Engineering?](http://www.psrast.org/whatisge.htm) A Simple Introduction, from Physicians and Scientists for Responsible Application of Science and Technology <http://www.psrast.org/whatisge.htm>
- "Overview of the Process of Plant Genetic Engineering" from the University of Nebraska-Lincoln <http://agbiosafety.unl.edu/education/summary.htm>
- The National Health Museum Graphics Gallery <http://www.accessexcellence.org/RC/VL/GG/>

## Procedure

Engage:

Day #1: Use the attached [True Food Shoppers Guide](#) to locate and purchase a variety of GM and non GM foods. Food products should be displayed for easy visibility in the classroom. Student groups will compile lists of foods they believe are and are not genetically modified. Teacher will reveal which category each food product falls into.

Explore:

1. Students will be shown the 10/4/02 broadcast of NOW with Bill Moyers (available at <http://www.pbs.org/now/classroom/genes.html>) which provides a 20-minute in-depth report on the potential benefits and dangers of genetically-modified foods. Students will complete the attached notes sheet, "What is Genetic Engineering?" while viewing the video.
2. Students will complete the attached pros and cons handout while engaging in classroom discussion of concepts covered in the video. \*see attached teachers guide if needed.

Explain/Extend

Day #2 Students will use the following website, <http://www.pbs.org/wgbh/harvest/>, to investigate genetically modified foods independently. Students will complete the tasks listed below using information from the site. All handouts and supplemental documents are attached to this unit plan.

1. [Guess What's Coming for Dinner?](#)
2. [Genetically Modified Food Risk/Benefit Sheet](#)

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3. [Harvest of Fear comprehension questions](#) (based on video clip from website)
4. [Engineer a Crop interactive](#) with written description

Day #3 Students will research one genetically modified food of their choice and create a presentation to be shared with the class. Presentations may take the form of a poster, PowerPoint or video clip. Presentations must include the following information to receive full credit:

1. Name of organism/food (common and scientific)
2. Picture of organism/food
3. Description of the processes involved in genetic modification
4. Risks/Benefits of modification
5. Extra credit points will be issued if students bring in a sample of the food product.

Resources:

<http://www.pbs.org/wgbh/harvest/>

<http://www.pbs.org/now/classroom/genes.html>

<http://www.teachersdomain.org>

<http://webpages.maine207.org/staff/kwolfe/GMOPBL/HarvestofFearInteractive%20worksheets.pdf>

### **Recommended Ward's Science Materials**

[Ward's Introduction to Plant Cell Culture Kit](#) [Item No. 117312](#)

[Ward's PCR Based Identification of Foodstuffs for GMOs Lab Activity](#) [Item No. 368954](#)

[Genetically Modified Corn Microscope Slide Set](#) [Item No. 950210](#)

[Genetically Modified Plants Lab Activity](#) [Item No. 368912](#)

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