

GENETIC FOOD TO EAT OR NOT TO EAT, THAT IS THE QUESTION

Performance Standards 12A/11A/13A/13B.H

Students will apply the concepts, principals and process of scientific inquiry to explain new biological technologies accordingly:

- *Knowledge*: understand the general and specific foundations of genetically modified foods.
- *Application*: conduct research about determining the safety of genetically modified foods.
- *Communication*: compare findings about societal perceptions about genetically modified foods.

Procedures

1. ***In order to know and apply concepts that explain how living things function, adapt and change (12A); the concepts, principles and processes of scientific inquiry (11A); the accepted practices of science (13A); and concepts that describe the interaction between science, technology and society (13B)***, students should experience sufficient learning opportunities to develop the following:
 - Review resources about commercially available, genetically modified foods.
 - Differentiate between subjective and objective data and their usefulness to the issue of the societal acceptance of genetically modified foods.
 - Formulate an issue hypothesis about the basis of acceptance of genetically modified foods.
 - Propose applicable survey and interview instruments and methodologies.
 - Project possible viewpoints and formats for consideration.
 - Conduct the issue investigation among peers, family and neighbors.
 - Complete all data collection requirements.
 - Interpret and represent analysis of results from findings.
 - Substantiate basis of perceptions (as possible).
 - Evaluate public perceptions about the value of scientific research.
 - Assess short- and long-term risks/benefits associated with genetically modified food supplies.
 - Report, display and defend the process and findings of genetically modified foods.
 - Generate further questions or issues for consideration.
 - Generalize public opinion responses.

Note to teacher: This activity relates to knowledge associated with Standard 12A, while addressing the Performance Descriptors for Stage H within Standard 11A. Connections to scientific research studies and their implications are a focus of Standard 13A. The interaction of policies associated with science, technology and society are described in Standard 13B. Family and Consumer Sciences students will enhance their knowledge of conducting an issue investigation that will be beneficial in their careers and the effect of genetically modified foods for their health and the effect on the economy. This meets Family and Consumer Sciences National Standards #9.0 (Food Science, Dietetics and Nutrition) and #14.0 (Nutrition and Wellness); Foodservice Cluster occupational skill standards #4 (Follow safe food handling and sanitation procedures), #14 (Ensure customer satisfaction) and #33 (Plan menus) and Illinois Workplace Skills in the areas of Solving Problems and Critical Thinking, Communicating on the Job and Maintaining a Safe and Healthy Work Environment. Students may use their findings in projects with Family, Career and Community Leaders of America (FCCLA) STAR events: Illustrated Talk, Applied Technology, Entrepreneurship, Food Service, Student Body and Power of One projects.

2. Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. Begin investigation of the societal impressions about genetically modified foods with examples of genetically modified foods that are in common use presently. Ask students about their own personal preferences about eating genetically modified foods. Determine a class definition for what genetically modified foods are (since genetic modification has been happening throughout history, they may think that this is a very recent advance). Complete the Idea Sheet as a pre-investigation activity. Provide students with up-to-date resources to research the issue. After conducting research, complete the Idea Sheet again (as a class, small groups or individuals) and use it to create a survey for questioning peers, family and neighbors about the degree of informed opinions on the widespread use of genetically modified foods. Gather the information from at least 10 different people, and analyze the responses appropriately. Discuss the findings, and generate further questions for consideration.

4. Evaluate each student's work using the Science Rubric as follows, and add the scores to determine the performance level:
- *Knowledge*: The explanation of genetically modified foods was complete and accurate.
 - *Application*: The issue investigation survey was conducted and compiled accurately and appropriately.
 - *Communication*: The findings about the societal perceptions were complete and insightful.

Examples of Student Work

- [Meets](#)
- [Exceeds](#)

Time Requirements

- Three-to-six classes (50 minutes)

Resources

- Copies of the Student Idea Page
- Internet sites
 - www.cfsan.fda.gov
 - <http://www.ornl.gov/hgmis/elsi/gmfood.html>
 - <http://www.csa.com/hottopics/gmfood/overview.html>
 - <http://www.agbiotech.net/topics/GMSafety.asp>
- Resource materials from "Integrating Science and Foods" from Secondary Science Scientific Literacy Project, ISBE, 1998
- "Food Science Course Curriculum," ISBE, 1993
- Science Rubric

GENETIC FOOD

TO EAT OR NOT TO EAT, THAT IS THE QUESTION

Student Idea Page

Biotechnology is likely to play an increasingly important role in the food industry in the 21st century. Is this good or bad, safe or unsafe? As you begin your research investigation, you may use the Internet, library and experts in the field. Listed below are some questions to be answered in order to make your inquiry investigation complete.

1. **Define Genetically Modified Foods - first yours and then the class definition.....**
2. **How can you decide if they are good or bad? Brainstorm ideas in class and record them. Determine the five most important criteria that are necessary to help a person decide if they are good or bad.**
3. **Research up-to-date resources to consider pros and cons about the use of genetically modified foods. Consider:**
 - **Crops**
 - **Animals**
 - **Environment**
 - **Society**

Also consider issues such as.....

- **Safety**
 - **Access and intellectual property**
 - **Ethics**
 - **Labeling**
 - **Society**
4. **What questions can you ask in your survey? Decide how to conduct your survey and how to compile the answers.**
 5. **Compare the findings from your classmates.**
 6. **What do you think? What other questions could be asked now?**

SCIENCE RUBRIC

Exceeds - must receive no more than one 3 and the rest 4s in the other areas of the rubric.

Meets - may receive no more than one 2 and a combination of 3s and 4s in the other areas of the rubric.

Approaches - may receive no more than one 1 and a combination of 2s, 3s or 4s, in the other areas of the rubric.

Begins - must receive at least a 1 in all 3 areas of the rubric.

	KNOWLEDGE	APPLICATION	COMMUNICATION
	Knows and understands scientific terms, facts, concepts, principles, theories and methods.	Applies scientific knowledge, skills and methods to manipulate, analyze, synthesize, create and evaluate.	Communicates scientific knowledge and applications through writing, speech and visual displays.
4	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are complete and correct. 	<ul style="list-style-type: none"> • Applications are thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Written, oral and/or visual communication is well organized and effective.
3	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are mostly complete and correct. 	<ul style="list-style-type: none"> • Applications are mostly thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Most of the written, oral and/or visual communication is well organized and effective.
2	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are somewhat complete and correct. 	<ul style="list-style-type: none"> • Applications are somewhat appropriate and accurate. 	<ul style="list-style-type: none"> • Some of the written, oral and/or visual communication is organized and effective.
1	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are minimally present or correct. 	<ul style="list-style-type: none"> • Applications are minimally appropriate and accurate. 	<ul style="list-style-type: none"> • Little of the written, oral and/or visual communication is organized and effective.
0	<ul style="list-style-type: none"> • All descriptions of scientific terms, facts, concepts, principles, theories and methods are missing and/or incorrect. 	<ul style="list-style-type: none"> • All applications are missing and/or incorrect. 	<ul style="list-style-type: none"> • All of the written, oral or visual communication is missing and/or lacks organization.
Score			