

Exploring Genetics

Student Pack

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What Is a Genetically Modified Food?



Directions: Watch the video, and answer these questions.

1. What does it mean to genetically modify a plant or animal?

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2. What types of plants went from unappetizing to edible through “artificial selection”?

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3. What does “cisgenic” mean?

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4. What word do scientists use to describe a new organism that has DNA from a completely different plant or animal?

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5. How did scientists make glowing pigs?

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GMO Foods



Directions: Look at the list of foods that contain GMOs. Write a list of foods you ate this week. Circle the ones that may contain GMOs. Use the Nutritionvalue.org website to learn more about the food ingredients.

Foods that contain GMOs:

corn	corn starch	high fructose corn syrup	sugar	flax
soy	beef	alfalfa	milk	margarine
papaya	squash	vegetable oil	canola oil	rice

List all the foods you ate this week. Circle the ones that may contain GMOs.

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Meet with your group, and discuss the GMO foods you ate. In the box, write the names of the GMO foods that were on all of your group members' lists.

Name Date

Milestone #1 Inquiry Question



Directions: Use what you learned in this milestone to answer the question.

How are genetically modified foods made?

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GMO Interview



Directions: Ask an adult these questions about GMOs. Record their answers, and be prepared to discuss them in class.

1. What does GMO stand for?

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2. What types of foods contain GMOs?

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3. Do you avoid GMOs? Why?

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4. What questions do you have about GMOs?

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What's the Deal with Genetically Modified Food?



Directions: Watch the video, and use the information to answer questions 1 and 2. Then, use your taste test to answer questions 3 and 4.

1. Why were GMO foods developed?

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2. Why do some people protest the use of GMO foods?

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3. Which corn chip do you think contains GMOs? Why do you think that?

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4. Do you think GMO foods taste very different from non-GMO foods?

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GMO: Friend, Foe, or I Don't Know

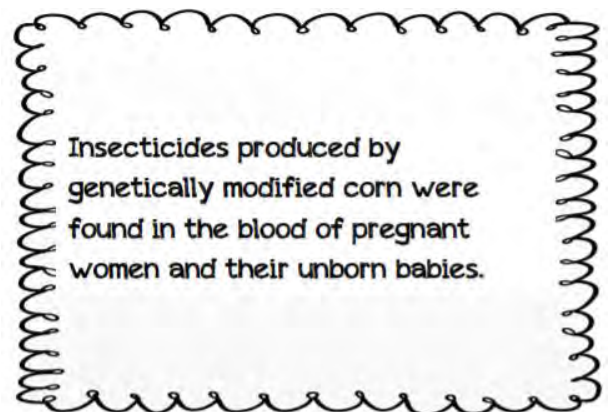


Directions: Cut apart the cards. Put the words “Friend,” “Foe,” and “I Don’t Know” at the top of your desk or table. Sort the cards into these three groups.

Friend - Statements in support of GMO foods

Foe - Statements against GMO foods

I Don't Know - Statements about GMO foods that require more information



GMO: Friend, Foe, or I Don't Know, cont.



Plants are being engineered to produce vaccines, proteins and other pharmaceutical products, in a process called "pharming."

GMOs might be used to identify allergens and remove them from organisms. This could reduce food allergies (peanut allergy, for example).

GMOs could compete or breed with the wild version of the species. For example, farmed fish do this.

Pollen from genetically modified plants may harm bees. Or genetically modified crops could lead to the development of resistance in insects exposed to genetically modified crops.

Since the wide scale consumption of food from genetically modified crops began, there have been no proven cases of harm to humans.

Allergenic genes could be accidentally transferred to other species, causing dangerous reactions in people with allergies.



GMO: Friend, Foe, or I Don't Know, cont.



GMO genes could “escape” and be passed on to other members of the same species, or even to other species. This could cause weeds to become resistant to herbicides, for example.

Genes could mutate, causing harmful effects.

Genetically engineered resistance to pests and diseases could reduce the amount of chemicals needed to protect crops. This could reduce harmful chemicals being sprayed in the environment and improve the health of farm and industrial workers.

Organisms modified to restore nutrients and soil structure may be able to help rehabilitate damaged land.

Genetically modified fruits and vegetables are less likely to spoil in storage or on the way to the grocery store. This could reduce the amount wasted food.

It might be possible to breed plants to produce biofuel (used to create energy).



GMO: Friend, Foe, or I Don't Know, cont.



Crops can potentially be made more resistant to pest outbreaks, reducing the danger of crop failure. Also, crops could be made more resistant to severe weather, such as frost, extreme heat or drought.

By inserting genes into crops like rice and wheat, we can increase their nutritional value. Genes that help produce vitamin A have been inserted into rice plants to give them more vitamin A. Since rice feeds more than 50% of the world's population, this could help reduce vitamin A deficiency.

Genes can be inserted into cattle to allow them to produce more milk.

In the future, farmers may be able to farm on less land because of higher crop yields.

We don't really know the long term effects of genetically modified foods.

Animal studies show organ damage, gastrointestinal and immune system disorders, accelerated aging and infertility may be linked to genetically modified foods.



Name Date

Milestone #2 Inquiry Question



Directions: Use what you learned in this milestone to answer the question.

Do you think GMOs are helpful or harmful? Why?

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Mealtime Math



Directions: Use a grocery store's website to calculate the cost of the meal using foods without GMOs. Then, calculate the cost of the same meal using foods with GMOs.

Ingredient	Organic/Non-GMO Price	"Regular" Price
Ground Beef (1 pound/16 ounces) 85% lean		
Spaghetti (8 ounces)		
Shredded Mozzarella Cheese (6-7 ounce bag)		
Romaine Lettuce (7-9 ounce bag)		
Ranch Dressing (12 ounces)		
Frozen Yogurt (1 pint)		
Skim Milk (1 gallon)		
Total Cost of the Meal		

How much less expensive is the "Regular" food?

Knowing what you now know about GMO foods, what would you choose for your family... the "healthier" non-GMO foods, or the less-expensive foods that may contain GMOs? Explain your answer.

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Name Date

Milestone #3 Inquiry Question



Directions: Use what you learned in this milestone to answer the question.

Why do you think organic, or non-GMO foods, cost more than foods with GMOs?

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Wheel of Chance Facts



Directions: Spin the Wheel of Chance and read about GMOs.
Write at least 8 facts you learn.

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2.
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3.
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4.
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5.
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6.
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7.
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8.
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Genetically Modified Foods Project Guidelines

Directions: Create a pamphlet, advertisement, article, or commercial in support of or against GMO foods.

- Step 1:** Choose the type of project you will make. Answer question #1 on the “Project Planner” by circling your choice.
- Step 2:** Gather facts to include in your project. Write your answers in the boxes on the “Project Planner”. They should include:
 - At least 5 facts about GMOs to support your opinion
 - Examples of at least 5 types of foods that may contain GMOs
- Step 3:** Create your project.
- Step 4:** Add graphics and colors.
- Step 5:** Check your spelling and grammar. Make sure your poster is neat and easy to read.
- Step 6:** Practice presenting your project.

Project Planning



Directions: Answer these questions to plan your GMO project.

1. What will you make for your project? (Circle one.)

Pamphlet

Advertisement

Article

Commercial

2. In the box below, write at least 5 facts to support your opinion about GMOs.

3. In the box below, list at least 5 foods that may contain GMOs.

Name Date

Milestone #4 Inquiry Question



Directions: Use what you learned from this milestone to answer the question.

What do you think is the strongest argument for GMOs? What do you think is the strongest argument against them?

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Being Informed About GMOs



Directions: Answer these questions about GMOs.

Why is it important that we are informed about the options available to us at the grocery store?

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How would you feel if you were not given these options?

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Are there places in the world where consumers are given more information?

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Are there places in the world where consumers are given less options and information?

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Name Date

Milestone #5 Inquiry Question



Directions: Use what you learned during this milestone to answer the question.

Why do you think so many people don't know what a GMO is? What could we do to better inform them?

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