



**Exploring Genetics**

# Teacher Pack



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# Materials Needed for the Projects in this Unit

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## Taste Test

Materials Needed:

- 2 types of corn chips (1 with GMOs and 1 without GMOs, like Garden of Eatin')

## Project

Materials Needed:

- Copy paper, construction paper, poster board, or cardstock
- Markers, crayons, or colored pencils
- Internet access



# Books About Genetically Modified Foods

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**Note for the Teacher:** Gather as many books as you can about genetically modified foods.

## Suggested Books:

**Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods** by Jeffrey M. Smith

**Genetically Modified Food** by Rebecca Rissman

**Global Perspectives: Genetically Modified Foods** by Vicky Franchino

**GMOs** by Better World Books

**GMOs Decoded** by Sheldon Krimsky

**GMOs: What's Hidden in Our Food?** by Michele Jacobson

**Hybrid: The History and Science of Plant Breeding** by Noel Kingsbury

**Modified: GMOs and the Threat to Our Food, Our Land, and Our Future** by Caitlin Shetterly

**Opinions About Genetically Modified Food** by Nabila Salam

**Pandora's Picnic Basket: The Potential and Hazards of Genetically Modified Foods** by Alan McHughen

**Seeds of Science: Why We Got It So Wrong on GMOs** by Mark Lynas

**So What's Controversial About Genetically Modified Food?** by John T. Lang



# What Is a Genetically Modified Food?

## Answer Key

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**Teacher Notes:** Show your students the video “[What Is a Genetically Modified Food?](#)” Have them answer the questions as they watch it. Discuss the answers together.

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

*It means that you change the DNA of the plant or animal.*

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

*Corn, wheat, rice, almonds, and bananas are all plants that went through “artificial selection”.*

3. What does “cisgenic” mean?

*It means the DNA snippets came from the same species of plants or animals.*

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

*Scientists use the word “transgenic”.*

5. How did scientists make glowing pigs?

*They used a gene from a luminescent jellyfish.*





# What's the Deal with Genetically Modified Food? *Answer Key*

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**Teacher Notes:** Show your students the video "[What's the Deal with Genetically Modified Food?](#)" and have your students answer the questions. Discuss the answers together.

## 1. Why were GMO foods developed?

*They were developed because they produce a crop that resists pests and tolerates weed-killing herbicides. They allow farmers to produce a lot more food in a lot more places with a lot less work.*

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

*There is research saying that GMO foods and the herbicides that are on them are more likely to make people sick.*

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

*Answers will vary.*

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

*They don't taste very different from non-GMO foods. It's hard to tell the difference.*





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

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FRIEND



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

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FOE





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

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I DON'T  
KNOW

# Genetics Quick Quiz



**Directions:** Read each question. Circle the best answer. Use the information you've learned to complete the sentences.

**1. What does it mean if foods are genetically modified?**

- A. They can grow anywhere.
- B. They taste better than other foods.
- C. Their DNA has been changed.
- D. They are more nutritious than other foods.

One food that has been genetically modified is ..... because  
.....

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

- A. They are too expensive.
- B. They can make people sick.
- C. They don't have enough protein.
- D. They are made from animals.

Another reason people protest the use of GMO foods is because .....  
.....

**3. What is one reason people might choose to eat GMO foods rather than buying organic foods?**

- A. Foods with GMOs are less expensive than foods without GMOs.
- B. Foods without GMOs are less expensive than foods with GMOs.
- C. Foods with GMOs contain more vitamins than foods without GMOs.
- D. Foods with GMOs taste better than foods without GMOs.

I would rather eat foods with / without GMOs because .....  
.....

# Genetics Quick Quiz *Answer Key*



**Directions:** Read each question. Circle the best answer. Use the information you've learned to complete the sentences.

**1. What does it mean if foods are genetically modified?**

- A. They can grow anywhere.
- B. They taste better than other foods.
- C. Their DNA has been changed.*
- D. They are more nutritious than other foods.

One food that has been genetically modified is *Answers will vary.* ..... because  
.....

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

- A. They are too expensive.
- B. They can make people sick.*
- C. They don't have enough protein.
- D. They are made from animals.

Another reason people protest the use of GMO foods is because *Answers will vary.* .....  
.....

**3. What is one reason people might choose to eat GMO foods rather than buying organic foods?**

- A. Foods with GMOs are less expensive than foods without GMOs.*
- B. Foods without GMOs are less expensive than foods with GMOs.
- C. Foods with GMOs contain more vitamins than foods without GMOs.
- D. Foods with GMOs taste better than foods without GMOs.

I would rather eat foods with / without GMOs because *Answers will vary.* .....  
.....



# Being Informed About GMOs

## Answer Key

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**Teacher Notes:** Have the students answer these questions independently. Discuss the answers as a class.

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

*Sample answer: It allows us to make decisions about what we put in our bodies.*

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

*Answers will vary.*

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

*Yes, many European countries require GMO labels on foods.*

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

*People in developing countries are given less options and information.*



# Genetics Summative Assessment

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## Part A

**Directions:** Read each statement. Write “F” on the line if the statement is for GMOs. Write “A” on the line if the statement is against GMOs.

..... Pollen from genetically modified plants may harm bees.

..... Since people started eating GMOs, there have been no proven cases of harm to humans.

..... Plants are being engineered to produce vaccines, proteins, and other pharmaceutical products.

..... Genes could mutate and make people sick.

..... It might be possible to breed plants to create biofuel and energy.

..... GMOs might contribute to a rise in allergic reactions.

## Part B

**Directions:** Use complete sentences to answer the questions.

Now that you know all about GMOs, do you think they are more helpful or harmful? Why?

.....  
.....  
.....

What steps could you take to eliminate GMOs from your diet?

.....  
.....

# Genetics Summative Assessment

## Answer Key

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### Part A

**Directions:** Read each statement. Write “F” on the line if the statement is for GMOs. Write “A” on the line if the statement is against GMOs.

- A Pollen from genetically modified plants may harm bees.
- F Since people started eating GMOs, there have been no proven cases of harm to humans.
- F Plants are being engineered to produce vaccines, proteins, and other pharmaceutical products.
- A Genes could mutate and make people sick.
- F It might be possible to breed plants to create biofuel and energy.
- A GMOs might contribute to a rise in allergic reactions.

### Part B

**Directions:** Use complete sentences to answer the questions.

Now that you know all about GMOs, do you think they are more helpful or harmful? Why?

*Answers will vary.* .....

.....

.....

What steps could you take to eliminate GMOs from your diet?

*Answers will vary.* .....

.....

Name .....

Date .....

# Genetics Project Rubric

	4	3	2	1
<b>GMO Facts</b>	The project includes five or more accurate facts about GMOs that support the author's opinion about GMOs.	The project includes four accurate facts about GMOs that support the author's opinion about GMOs.	The project includes two or three accurate facts about GMOs that support the author's opinion about GMOs.	The project includes one accurate fact about GMOs that supports the author's opinion about GMOs.
<b>GMO Foods</b>	The project lists five or more foods that may contain GMOs.	The project lists four foods that may contain GMOs.	The project lists two or three foods that may contain GMOs.	The project lists one food that may contain GMOs.
<b>Neatness</b>	The project is very neat and easy to read. It includes graphics and colors that support the author's opinion.	The project is neat and easy to read. It includes graphics and colors that are relevant to the project.	Parts of the project are hard to read. There are some graphics and colors, but they aren't all relevant to the project.	The project isn't neat or easy to read. It doesn't contain graphics or colors that are relevant to the project.
<b>Presentation</b>	The presentation was very clear and easy to understand. The student explained all the parts of the project and his/her opinion about GMOs.	The presentation was clear and easy to understand. The student explained most of the parts of the project and his/her opinion about GMOs.	Parts of the presentation were hard to understand. The student didn't explain some of the project or his/her opinion about GMOs.	The presentation wasn't clear or easy to understand. The student didn't explain the project or his/her opinion about GMOs.

Teacher's comments: .....

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