

# Genetically Modified Organisms.

*Are they a good thing or a bad thing? What do you think?*

## **GMO: Genetically Modified Organisms**

Here's a scenario for you to consider. Let's say you are a farmer, a corn farmer. And like all corn farmers, you have to watch out for those weeds. You spray pesticides and herbicides on your fields to try and kill the weeds. The herbicides are working well. No weed trouble for you! But unfortunately, the herbicides start killing more than just the weeds. They kill your corn! Wouldn't it be nice if you could somehow make your corn resistant to herbicides?

Some bacteria contain a gene that makes them tolerant to an herbicide (e.g., Glyphosate, the key ingredient in Roundup). The gene is called HT for herbicide tolerant.

Scientists have figured out a way to get the HT gene from the bacteria into the DNA of corn, soybeans and cotton. They insert DNA containing the HT gene into the DNA of the plant cells. The plants that carry this gene become Herbicide Tolerant (HT). When they are sprayed with Roundup, they do not die like plants that don't have the gene. So, Roundup will kill the weeds but not the crop, which is very convenient for the farmer.

However... weeds, like all organisms, have some genetic variability. That means that each time a cell divides, new mutations are introduced into the daughter cells. These mutations occur at low, low rates. But, when you are spraying huge populations of plants with herbicides, eventually you will find that some have mutated to be INSENSITIVE to the herbicide. In fact, this kind of mutation has appeared already--many weed are now resistant to Roundup and causing farmers a lot of trouble.

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**Fabulous article** from Slate magazine is here:

[http://www.slate.com/articles/health\\_and\\_science/science/2015/07/are\\_gmos\\_safe\\_yes\\_the\\_case\\_against\\_them\\_is\\_full\\_of\\_fraud\\_lies\\_and\\_errors.html?wpsrc=sh\\_all\\_dt\\_tw\\_bot](http://www.slate.com/articles/health_and_science/science/2015/07/are_gmos_safe_yes_the_case_against_them_is_full_of_fraud_lies_and_errors.html?wpsrc=sh_all_dt_tw_bot)

It does a great job explaining the pros and cons of GMOs in rational way. It separates the emotions from the facts. It is also up-to-date!

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The presence of genetically modified foods in our grocery stores is a topic of hot debate. This is a list of some of the pros and cons.

<http://www-tc.pbs.org/now/classroom/geneteachers.pdf>

A great reading + debating exercise about GM “golden rice” is here:  
[http://sciencecases.lib.buffalo.edu/cs/files/golden\\_rice\\_debate.pdf](http://sciencecases.lib.buffalo.edu/cs/files/golden_rice_debate.pdf)

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### Writing Challenge:

What do you think about genetically modified foods? Are they something we should be worried about or will they help solve the world’s hunger problem going into the next century? Write a persuasive justification of your position.

If you are going to write persuasively, you have to take a position on one side of the argument and then write your reasons for taking this position. It’s helpful to list the main reasons you believe what you do, and then explain yourself.

Follow the link below to a great organizer that will help you think through your argument before you start writing.

[http://www-k12.atmos.washington.edu/k12/modules/nw\\_wx\\_watch/persuasion2.html](http://www-k12.atmos.washington.edu/k12/modules/nw_wx_watch/persuasion2.html)

Now you are ready to write your paper!