

## Student Exploration: Genetic Engineering

**Vocabulary:** callus, exon, genetic engineering, genetically modified organism, genome, green fluorescent protein (GFP), herbicide, insecticide, intron, promoter, transcription, transformation

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

1. What are some things that can damage a farmer's crops? Bacteria and different insects. As well as birds and other small mammals.
2. What can farmers do to protect their crops? They may use sprays and in different locations, they use indoor farming as it's becoming very popular although it is a bit more expensive.

### Gizmo Warm-up

Many farmers use chemical **herbicides** to kill weeds and **insecticides** to kill insects. Using **genetic engineering**, scientists have developed ways to resist harmful crop pests. In the *Genetic Engineering Gizmo*, you will use genetic engineering techniques to create **genetically modified** com.



Check that **Task 1** is selected. The Gizmo shows petri dishes that contain different strains of bacteria (white dots) and caterpillars (*Lepidoptera* sp. larvae). In the first challenge, your goal is to find bacteria that produce toxins that kill the caterpillars. Click **Play** (▶).

1. What do you observe? A small amount of the caterpillars died while most were able to survive.
2. Which strains of bacteria were able to kill *Lepidoptera* sp. larvae? Strains 4, 5, 8 and 10.

Were some more effective than others? Explain. Other caterpillars were killed off meaning it affected some a lot more than others.

Some bacteria are able to produce a toxin that kills *Lepidoptera* sp. larvae. Find out which gene is responsible for this toxin in the next step.

# 13 4 Applications Of Genetic Engineering Answer Key

**Marcel A. Müller**



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