

# GENE EDITING OUR WORLD

**Gene editing** is a form of **genetic engineering** in which DNA is inserted, deleted, or altered in an organism's genome. One popular gene editing technology is called **CRISPR**.

## HOW IT WORKS:

### STEP 1. RECOGNITION

Design a **guide molecule** (RNA) to recognize the **target gene** – the sequence of DNA you want to edit.



### STEP 2. CLEAVAGE

A **CRISPR-associated (cas) protein** cuts the double-stranded DNA at the target gene.



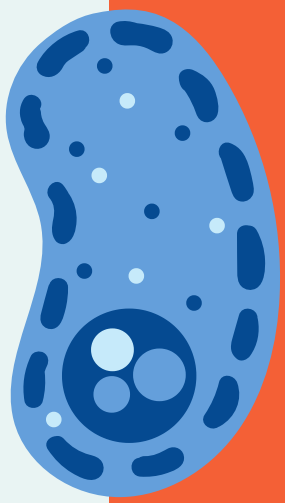
### STEP 3. REPAIR

The cell recognizes that the **broken DNA** needs to be **repaired**. The DNA is fixed with a new addition, deletion, or substitution included.



### FARMING

Bioengineered microbes can be used to improve crops by breaking down soil pollutants, producing nutrients, and acting as non-chemical pesticides.



### PUBLIC HEALTH

People get Lyme disease from ticks that have bitten infected mice. Edited mice could break this cycle.



### FOOD

Crops can be edited to enhance nutritional content, increase resistance to pests, or improve safety for human consumption.



### HEALTHCARE

Gene editing, currently being tested in humans, might one day be regularly used to treat genetic conditions, such as sickle cell disease.



## THINGS TO CONSIDER:

- Who gets to own modified organisms or the technology used to alter DNA?
- Who should determine how this technology is used?
- What rules should be put in place to ensure the responsible use of this technology?



PERSONAL  
GENETICS  
EDUCATION &  
DIALOGUE



CREATED BY GILLIAN MCNEIL, ROBERT O'MALLEY, ROBIN BOWMAN  
& THE PGED TEAM  
PUBLISHED JULY 2024  
WWW.PGED.ORG