

# SCIENCE·3D

## THE REAL BLACK PANTHER

In this packet, sample student answers are provided in **red** and notes to teacher are in **blue**.

During this **Mission Research**, students will use their understanding of genetics to explore Genetically Modified Organisms (GMOs), artificial selection, and the resilience of crops in a changing world.



## ARTIFICIAL SELECTION

Today, the news is full of stories about Genetically Modified Organisms (GMOs). Usually these stories refer to scientists using genetic engineering to insert specific new genes or traits into organisms using technology. But, people have been changing the genes of organisms for thousands of years in a much slower way. Have you noticed that domestic dogs don't really look like wild dogs? Did you know the plants we grow as crops look and taste very different from the wild varieties? The ability of domestic plants to tolerate certain environmental conditions are also very different from their wild ancestors!

How did domestic organisms become so different from their wild relatives? Artificial selection played a significant role. Humans bred individuals with traits (like color, taste of a fruit, or temperament of a dog) that they liked. They didn't breed individuals with traits that they disliked. Over many generations, the traits of individuals in the population changed.

Pick a domestic animal or plant (e.g. dog, corn). Conduct research to learn about its wild ancestor. Research how humans used selection to create traits that were desirable.

1. **Create** a poster or presentation that shows the change from the wild ancestor to the domesticated plant or animal. Make sure the poster has pictures or drawings of the ancestral species and the domestic variety. Highlight the traits that were selected for and the traits that were selected against.



Answers will vary but should include appropriate drawings and pictures of wild and domestic types. Traits like color and height might be selected *for*. Others, like bitter taste or aggressiveness, might be selected *against*.

2. Many domestic crops have much larger and more nutritious fruits or nuts than their wild counterparts. Often domestic crops survive under a much smaller range of conditions in the wild. **Propose** a way to use artificial selection to breed crops that can survive under more conditions but still have good quality fruits or nuts.

Answers should include the idea that wild plants will be bred with domestic plants. They would then choose the individual plants that were able to survive better but also had good nutritional value.

They would continue this for many generations until you had great nutritious crops that could survive many conditions.