

## Chapter 12: Genetics

### Lesson 1

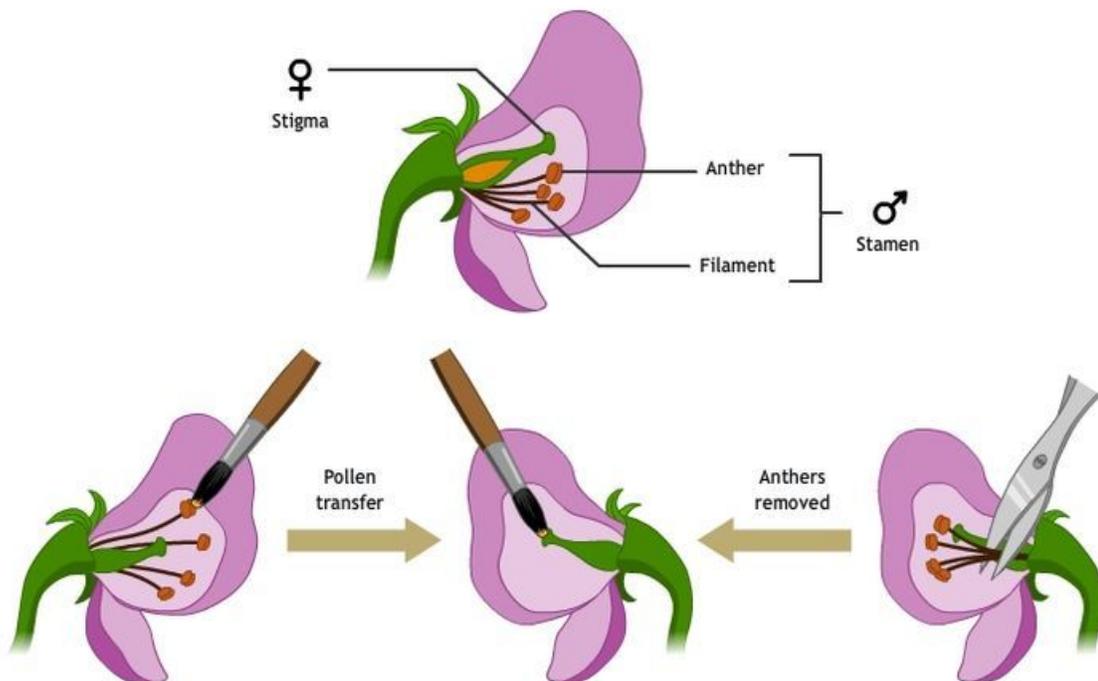
Genetics is the science of \_\_\_\_\_. If you inherit a trait, it means you were born with the trait and got it from your parents. For most of human history, how humans and other organisms inherit their traits was a mystery. But long before anyone knew about \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, an obscure monk in the Austro-Hungarian Empire discovered the laws of inheritance in the mid-1800s.

\_\_\_\_\_ was a contemporary of Charles Darwin, but they did not know each other. Mendel's work was not recognized until the 20<sup>th</sup> century, about 30 years after his death.



### Pea Plants

Mendel discovered the laws of genetics through his study of heredity in pea plants. Like plant breeders today, Mendel would take two pea plants with some specific traits, and \_\_\_\_\_ them to see what the offspring would be like.



As the picture shows, Mendel would remove the anthers from one of the flowers. This prevented \_\_\_\_\_, a kind of \_\_\_\_\_ reproduction. For every cross, Mendel knew who the parents were and exactly what kind of traits they had.

## Mendel's Experiments

Mendel selected easily identifiable traits for his breeding experiments. One of the traits was \_\_\_\_\_: either \_\_\_\_\_ or \_\_\_\_\_. Tall pea plants would always produce \_\_\_\_\_ pea plants when mated together. Short pea plants would produce \_\_\_\_\_ pea plants when mated together. Both varieties were called \_\_\_\_\_. Mendel asked, what happens if a tall pea plant is mated to a short pea plant? Conventional wisdom said the offspring would be \_\_\_\_\_, but this is what Mendel actually observed:

P-generation (Grandparents):

F1-generation (Parents):

F2-generation (Children):

Mendel performed thousands of trials like this and counted thousands of offspring. He always found a \_\_\_\_\_ ratio of tall to short in the F2 generation. He also tested other traits, like seed color, and obtained a similar result.

Because of the regularity he observed in his trials, Mendel generalized his findings into the first two laws of genetics:

1. Law of dominance:

2. Law of segregation: