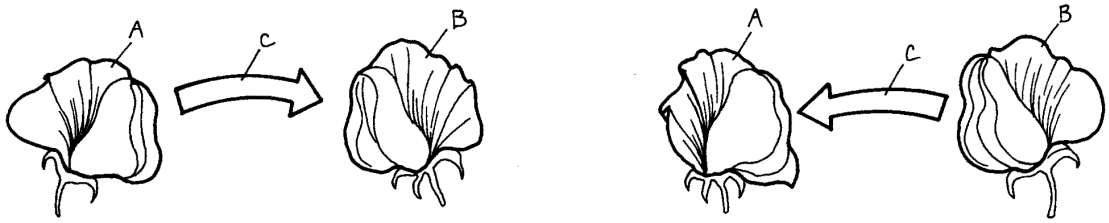
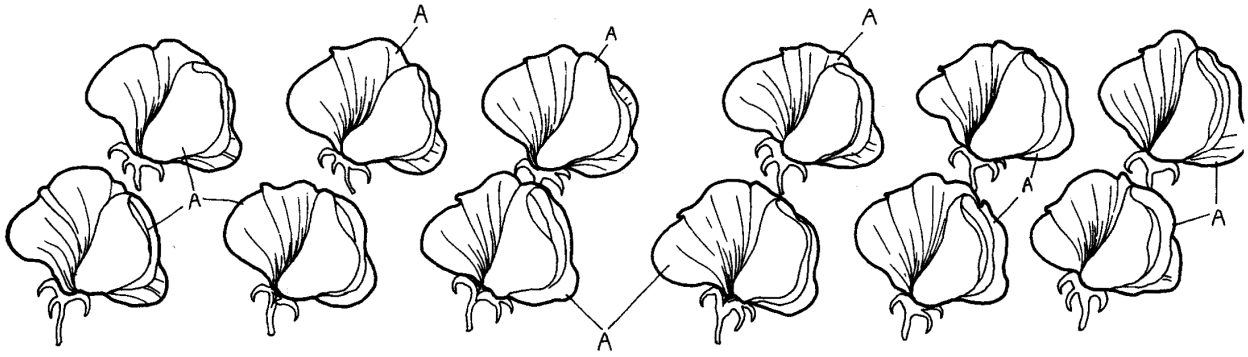
Genetics Name:

Counting Flowers Period:

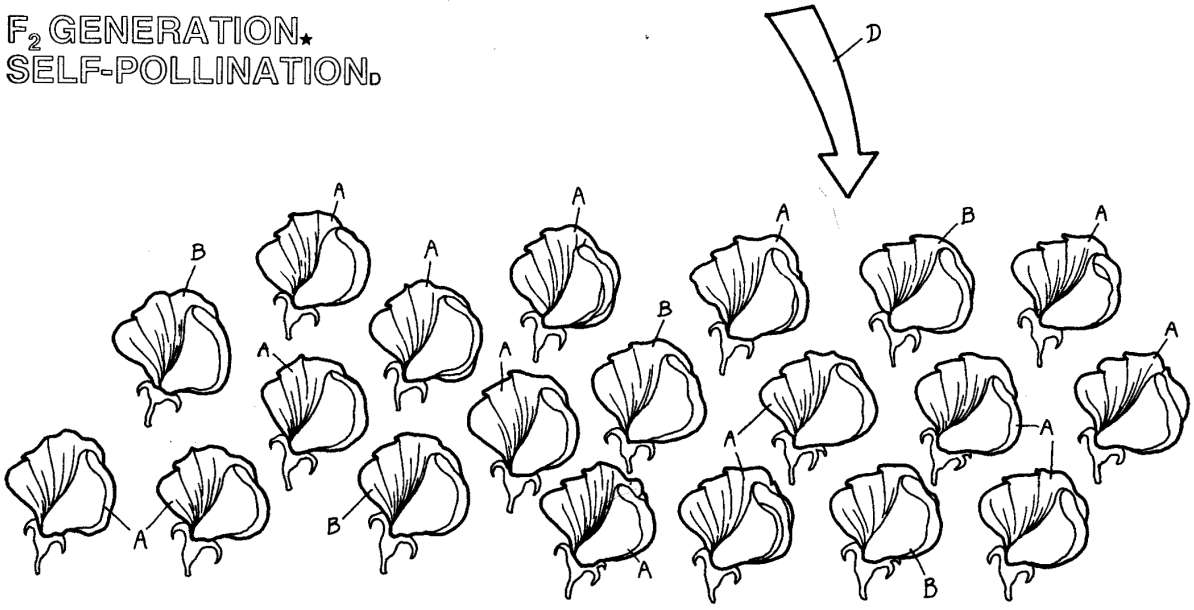
P_1 GENERATION★
PURPLE FLOWER$_A$
WHITE FLOWER$_B$
CROSS-POLLINATION$_C$



F_1 GENERATION★



F_2 GENERATION★
SELF-POLLINATION$_D$



adapted from The Biology Coloring Book (1986) by Robert D. Griffin

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Follow the instructions below to color-code the diagram and answer the questions. You can use Chapter 6, Section 1 of your book to help you.

Mendel's experiments with pea plants were very successful because he was careful and methodic about his experiments. First, he made sure that he only had ***pure-breeding*** plants. This meant that when these plants self-pollinated, the offspring plants produced always had the same traits as their parent. Mendel kept the plants in different parts of his garden. He also made sure that his plants kept the same traits, through two years of generations, before he began to cross them. For this particular exercise, you will be looking at an example of an experiment Mendel performed when he took pea plants that grew purple flowers, and crossed them with pea plants that grew white flowers.

• First, carefully color the letters in the title P_1 GENERATION in black ☐. P_1 stands for ***parent generation***; in other words, the parent plants that get crossed. Next, for just the flowers in the P_1 generation, color PURPLE FLOWER and the flowers (A) in purple (*duh!*) ☐. Leave the WHITE FLOWER and the flowers (B) white ☐. Pollen is usually orange in color, so color CROSS-POLLINATION and the arrows (C) with orange ☐.

• So, the seeds were cross-pollinated (pollen went from one plant to another. Seeds were made. Those seeds were planted, and they grew into plants. These pea plants are referred to as ***first generation***, and given the code F_1. Carefully color the letters in the title F_1 GENERATION in black ☐. Now, for every F_1 flower that has an (A) pointing to it, color that flower purple ☐. For every F_1 flower that has a (B) pointing to it, leave it white ☐.

• Mendel next allowed all of the plants in the F_1 generation to ***self-pollinate***. This meant that each plant gave itself its own pollen. Nothing was mixed in from other plants. Color SELF-POLLINATION and the arrow (D) in yellow ☐. The seeds from these self-pollinated plants grew into new plants, forming yet another generation. This second generation gets the code F_2. Carefully color the letters in the title F_2 GENERATION in black ☐. Now, for every F_2 flower that has an (A) pointing to it, color that flower purple ☐. For every F_2 flower that has a (B) pointing to it, leave it white ☐.

Answer the questions below. *When you do, remember that each flower in the diagram stands for a plant. These are <u>not</u> the number of flowers on a single plant.*

1. Fill out the chart below with the number of plants that had that particular flower color.

Pea Plant Flower Color Data		
	purple	white
F_1 generation		
F_2 generation		

2. What was the dominant trait for flower color? _____

3. What was the recessive trait for flower color? _____

4. Set the F_2 generation data into a fraction and reduce it: $\frac{\text{purple}}{\text{white}}$ = _____ = _____

5. Now put your reduced answer into a ratio like this purple **:** white _____

6. Does this match the ratio that Mendel figured out? _____ *(hint: check Summary on p.179)*

7. How many parents does a self-pollinating plant have? _____ If it's made from cross-pollination? _____