

Standard: Students will analyze how biological traits are passed on to successive generations.

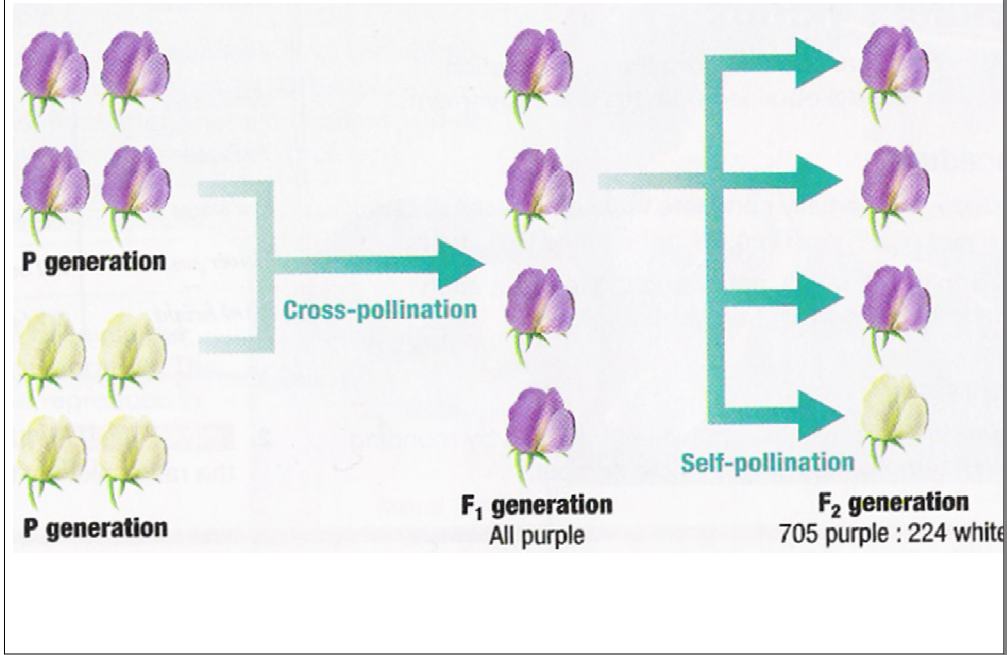
Element: Using Mendel's laws, explain the role of meiosis in reproductive variability.

EQ: How can we use Punnett squares to predict genotypes and phenotypes of offspring?

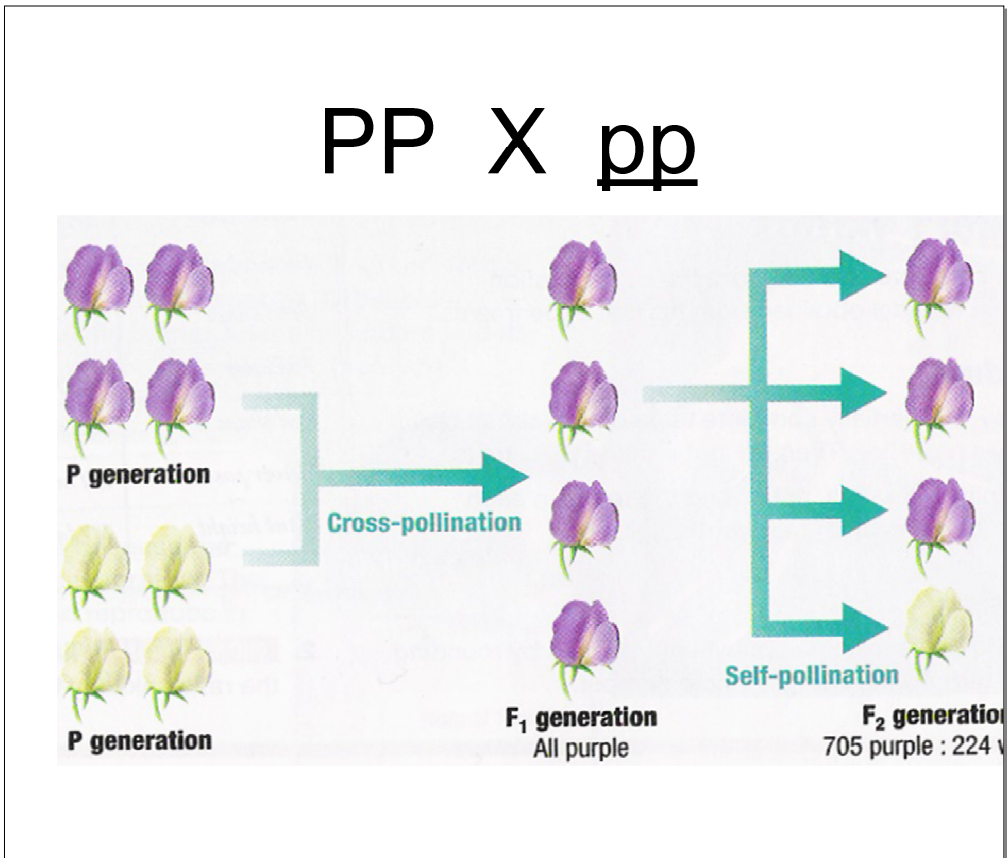
A **Punnett square** is a model that predicts the likely outcomes of a genetic cross.

	B	B
b	Bb	Bb
b	Bb	Bb

Let's use a Punnett square to model Mendel's first cross:



$PP \times pp$



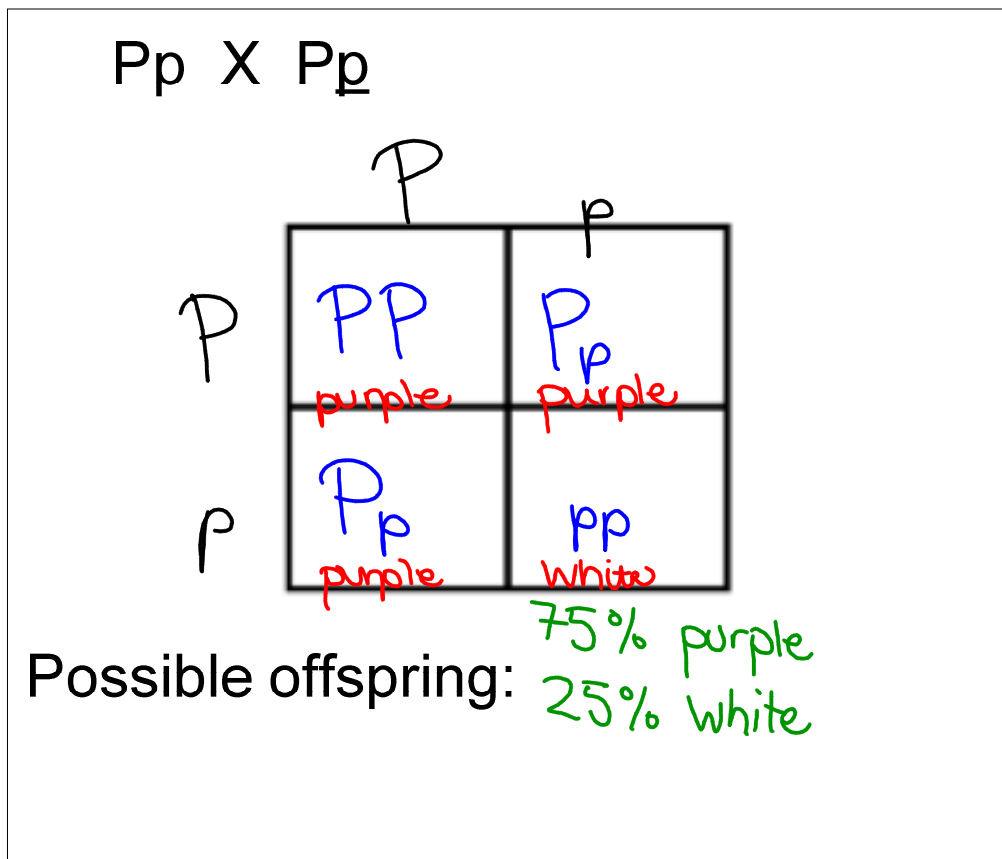
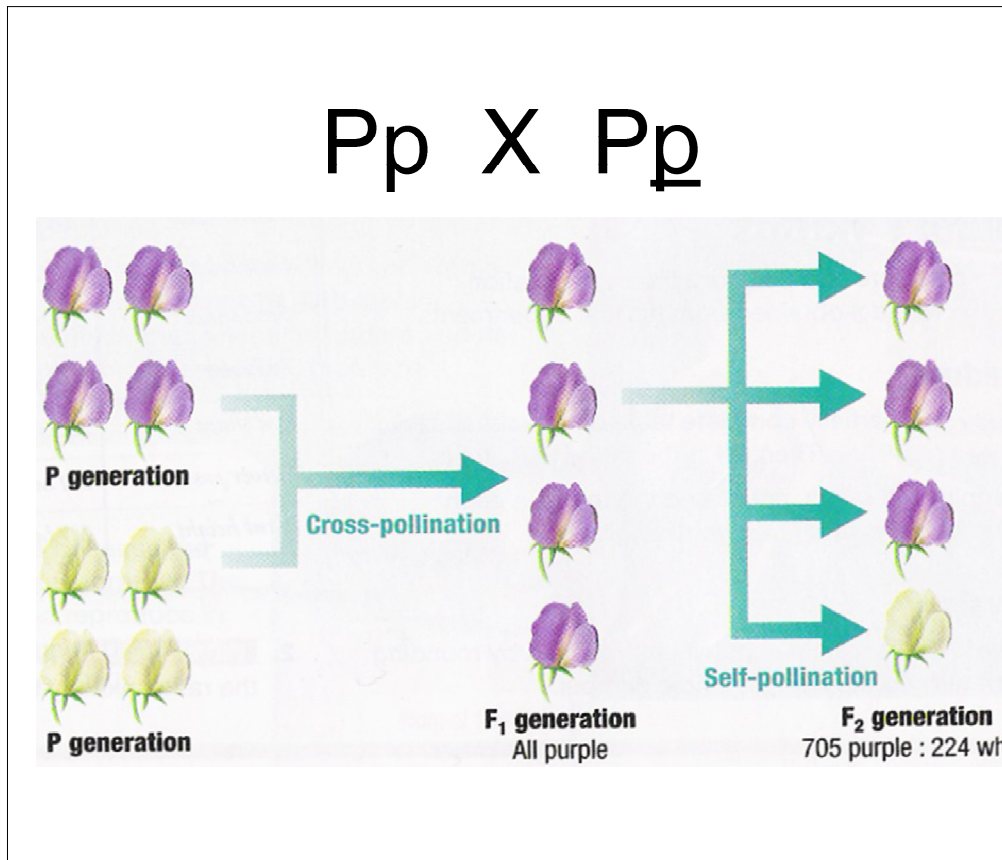
PP X pp

	P	P
p	Pp	Pp
p	Pp	Pp

Possible offspring:
100% purple

Let's use a Punnett square to model Mendel's second cross:

The diagram illustrates Mendel's second cross. On the left, the P generation consists of four purple flowers and four white flowers. A bracket labeled "Cross-pollination" points to the F1 generation, which consists of four purple flowers, each labeled with the genotype Pp. A bracket labeled "Self-pollination" points from the F1 generation to the F2 generation. The F2 generation consists of four purple flowers and one white flower. Below the F2 generation, the text reads "705 purple : 224 white".



In humans, Huntington's Disease is caused by a dominant allele. If a man who is heterozygous marries a woman who is homozygous recessive, what is the possibility of their children having the disease?

Dominant Trait: *Huntington's D.* Recessive Trait: *normal*

	Genotype		Phenotype	
Father	<i>Hh</i>		<i>has disease</i>	
Mother	<i>hh</i>		<i>normal</i>	
Children	<i>Hh</i>	<i>50 %</i>	<i>disease</i>	<i>50 %</i>
	<i>hh</i>	<i>50 %</i>	<i>normal</i>	<i>50 %</i>
		%		%
		%		%

	<i>H</i>	<i>h</i>
<i>h</i>	<i>Hh</i>	<i>hh</i>
<i>h</i>	<i>Hh</i>	<i>hh</i>