

# Working Genetics Problems

solving problems with Punnett squares

Always follow these **3** steps when working genetics problems.

1

Write the **key**. Information needed to write the key will either be stated in the problem or given.

2

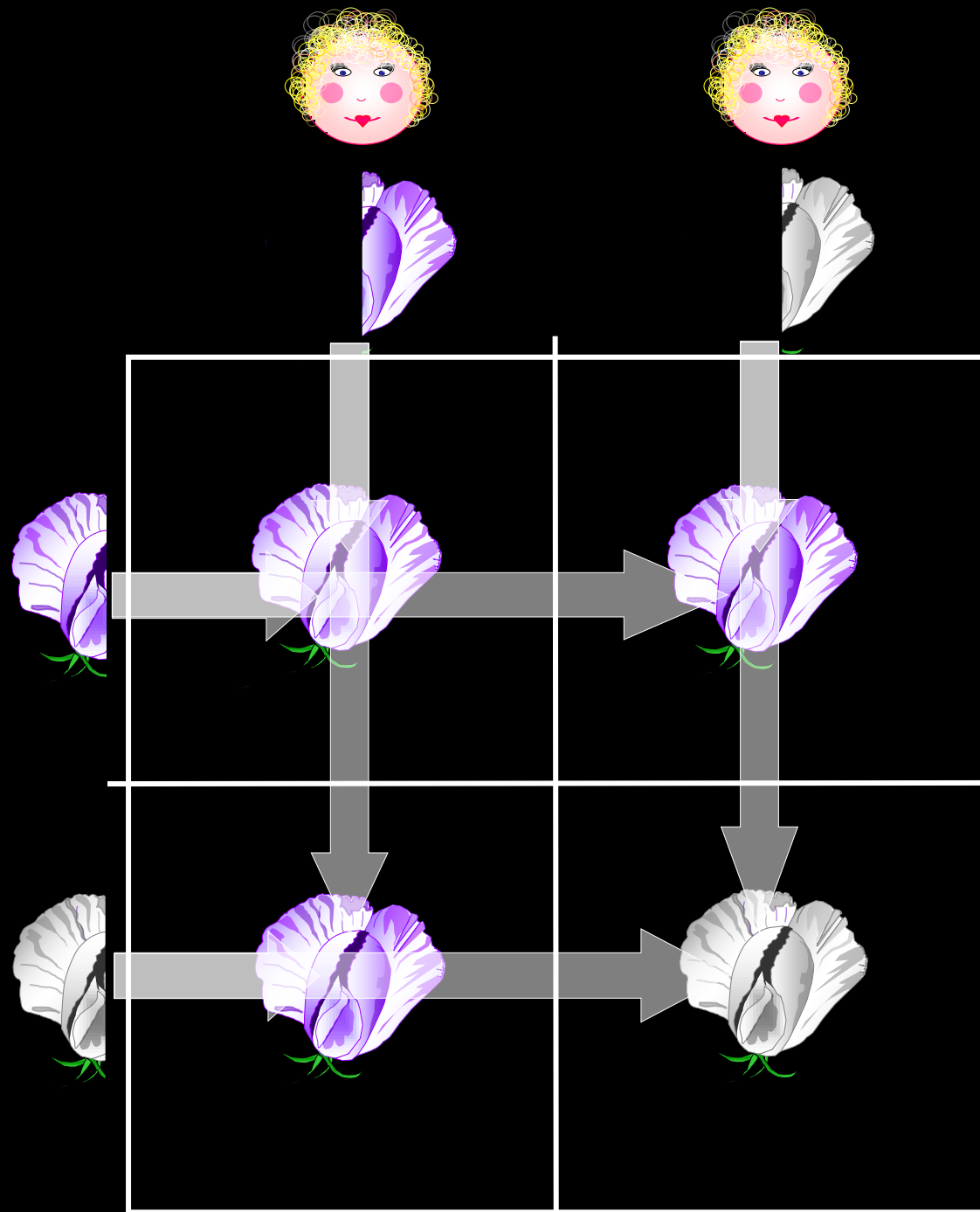
Determine the **genotypes** of both parents.

3

Solve the problem using a **Punnett square**.

Possible combinations of genes are shown in a Punnett square.





One parent contributes a purple flower gene; one parent contributes a white flower gene.



Possible combinations of genes are shown in a Punnett square.

**Yellow** seed color is dominant over **green**.



Substitute letters for genes.



P



p

Purple flower color is dominant over white.



P



PP



Pp

P - purple  
p - white



p



Pp



pp

Substitute letters for genes.



Y



Y

Yellow seed color is dominant over green.



Y

Y $\bar{y}$

Y $\bar{y}$

Y - yellow  
 $\bar{y}$  - green



Y

Y $\bar{y}$

Y $\bar{y}$

	Y $\bar{y}$	Y $\bar{y}$
	Y $\bar{y}$	Y $\bar{y}$

How are these flowers different?



PP



Pp

Both flowers have the same physical appearance or **phenotype**: they are both **purple**.

The flowers have different genetic makeup or **genotype**.



Describe the **phenotype** of these peas.



A purple flower can be pure  
(homozygous)



PP

or

hybrid (heterozygous).



Pp

The phenotype is the same: both flowers  
are purple.

The genotype is different: one flower is  
PP, one is Pp.

A white flower can be only  
be pure (homozygous).



$\overline{pp}$

Why?

# Follow these steps for every genetics problem.

1

Write the key.

upper case = dominant trait    P = purple

lower case = recessive trait     $\bar{p}$  = white

2

Determine both genotypes (parents).

Cross a pure purple flower with a white flower.     $PP \times \bar{p}\bar{p}$

3

Work the problem with Punnett square.