

## Unit L3 • Traits and Heredity

### Mendel's Experiments

The first table below shows what happened when Mendel crossed purebred purple-flowering pea plants with purebred white-flowering pea plants. Each F<sub>1</sub> **hybrid inherits** one purple-flower allele and one white-flower allele. Because the purple-flower allele is **dominant**, the flowers on all the F<sub>1</sub> plants are purple.

#### FLOWER COLOR: Making the F<sub>1</sub> generation

All allele pairs <b>inherited</b> from the purebreds are the same	<b>purple</b> white	<b>purple</b> white	<b>purple</b> white	<b>purple</b> white
F <sub>1</sub> flower color will be:	purple	purple	purple	purple

But when the F<sub>1</sub> **hybrids** produce the next **generation** of **hybrids**, things are different. Each F<sub>1</sub> parent has an equal chance of giving a purple-flower or a white-flower allele to each of its F<sub>2</sub> **offspring**. The four possible outcomes shown below are all equally likely, and will tend to show up in equal numbers when two plants have a large number of **offspring**.

#### FLOWER COLOR: Making the F<sub>2</sub> generation

The 4 equally likely allele pairs <b>inherited</b> from the F <sub>1</sub> <b>generation</b>	<b>purple</b> <b>purple</b>	<b>purple</b> white	white <b>purple</b>	white white
F <sub>2</sub> flower color will be:	purple	purple	purple	white

The two tables above show why Mendel found that none of the F<sub>1</sub> plants showed **recessive traits**, but **recessive traits** showed again in about one quarter of the F<sub>2</sub> **generation** plants. Compare these tables to the F<sub>1</sub> and F<sub>2</sub> rows in the diagrams earlier in this section.

Complete the tables below by writing in the **traits** for the F<sub>2</sub> **generation** plants in the stem-length and pod-shape breeding experiments:

#### STEM LENGTH: Making the F<sub>2</sub> generation

The 4 equally likely allele pairs <b>inherited</b> from the F <sub>1</sub> <b>generation</b>	<b>long</b> <b>long</b>	<b>long</b> short	short <b>long</b>	short short
F <sub>2</sub> stem length will be:				

#### POD SHAPE: Making the F<sub>2</sub> generation

The 4 equally likely allele pairs <b>inherited</b> from the F <sub>1</sub> <b>generation</b>	<b>smooth</b> <b>smooth</b>	<b>smooth</b> bumpy	bumpy <b>smooth</b>	bumpy bumpy
F <sub>2</sub> pod shape will be:				