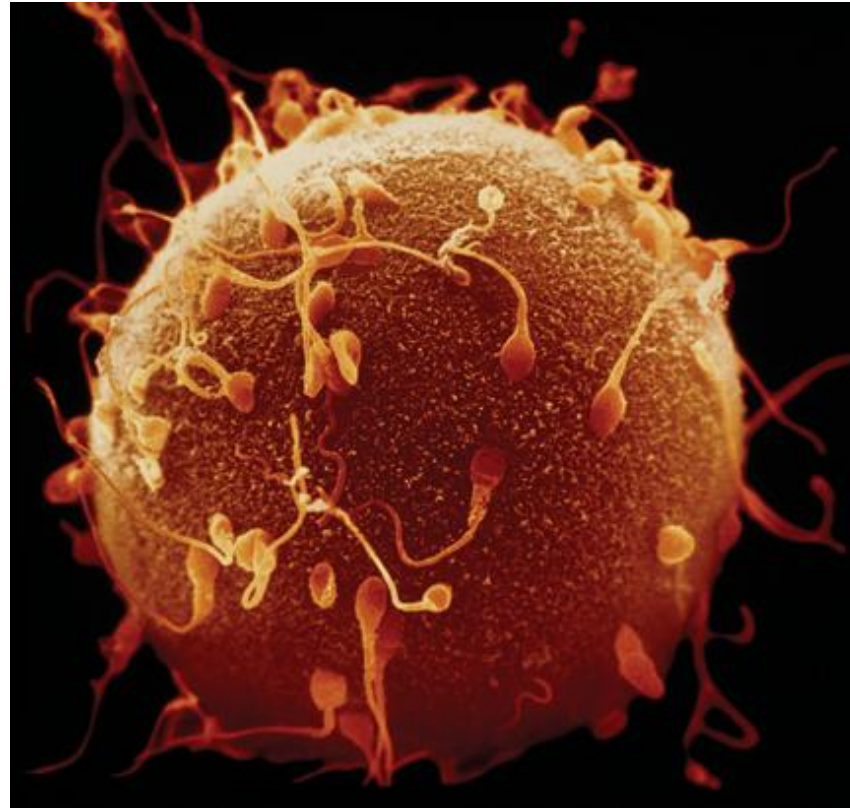


6.3 Mendel and Heredity

KEY CONCEPT

Mendel's research showed that traits are inherited as discrete units.



6.3 Mendel and Heredity

▶ Mendel laid the groundwork for genetics.

- **Traits** are distinguishing characteristics that are inherited.
- **Genetics** is the study of biological inheritance patterns and variation.
- **Gregor Mendel** showed that traits are inherited as discrete units.
- Many in Mendel's day thought traits were blended.



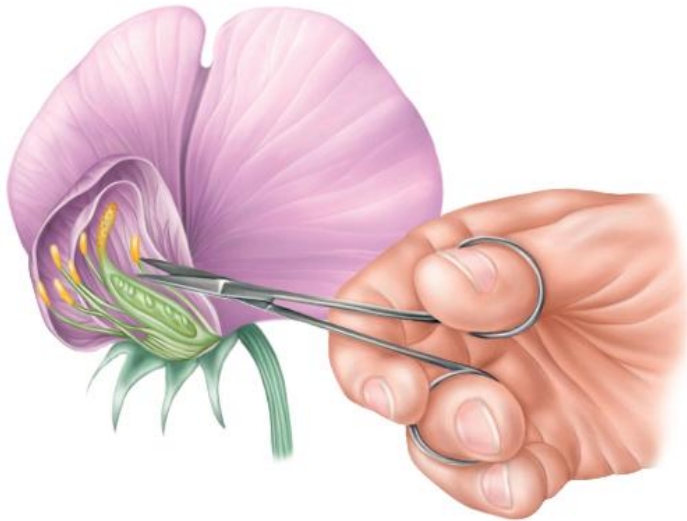
6.3 Mendel and Heredity

- ▶ **Mendel's data revealed patterns of inheritance.**
 - Mendel made three key decisions in his experiments.
 - use of ***purebred*** plants
 - ***control*** over breeding
 - observation of ***seven*** “either-or” traits

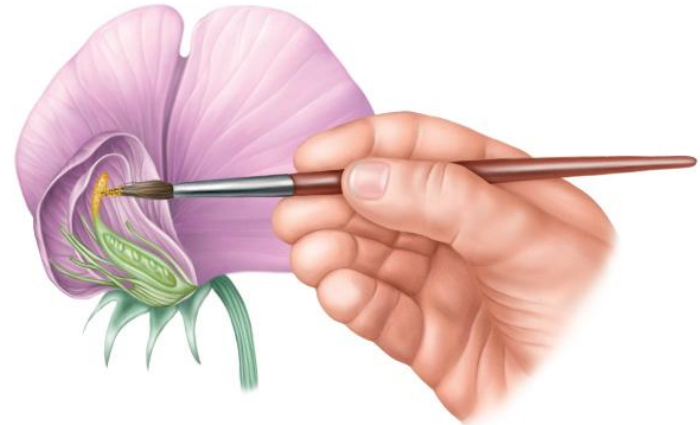


6.3 Mendel and Heredity

- Mendel used **pollen** to fertilize selected pea plants.
 - P generation crossed to produce **F₁** generation
 - interrupted the self-pollination process by removing male flower parts



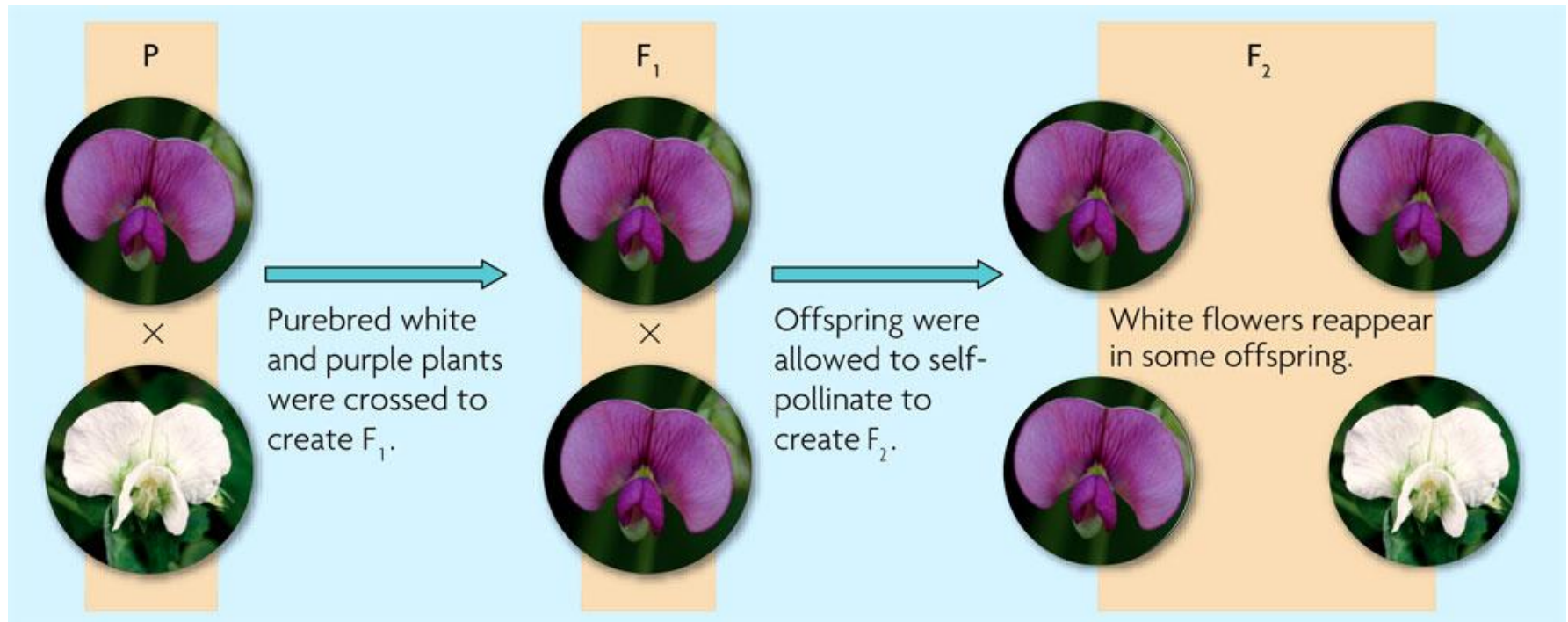
Mendel controlled the fertilization of his pea plants by removing the male parts, or stamens.



He then fertilized the female part, or pistil, with pollen from a different pea plant.

6.3 Mendel and Heredity

- Mendel allowed the resulting plants to self-pollinate.
 - Among the F_1 generation, all plants had purple flowers
 - F_1 plants are all heterozygous
 - Among the F_2 generation, some plants had purple flowers and some had white



6.3 Mendel and Heredity

- Mendel observed patterns in the first and second generations of his crosses.

FIGURE 6.10 MENDEL'S MONOHYBRID CROSS RESULTS			
F₂ TRAITS	DOMINANT	RECESSIVE	RATIO
Pea shape	5474 round	1850 wrinkled	2.96:1
Pea color	6022 yellow	2001 green	3.01:1
Flower color	705 purple	224 white	3.15:1
Pod shape	882 smooth	299 constricted	2.95:1
Pod color	428 green	152 yellow	2.82:1
Flower position	651 axial	207 terminal	3.14:1
Plant height	787 tall	277 short	2.84:1

6.3 Mendel and Heredity

- Mendel drew three important conclusions.
 - **Traits** are inherited as discrete units.
 - Organisms inherit **two copies** of each gene, one from each parent.
 - The two copies **segregate** during gamete formation.
 - The last two conclusions are called the **law of segregation**.

