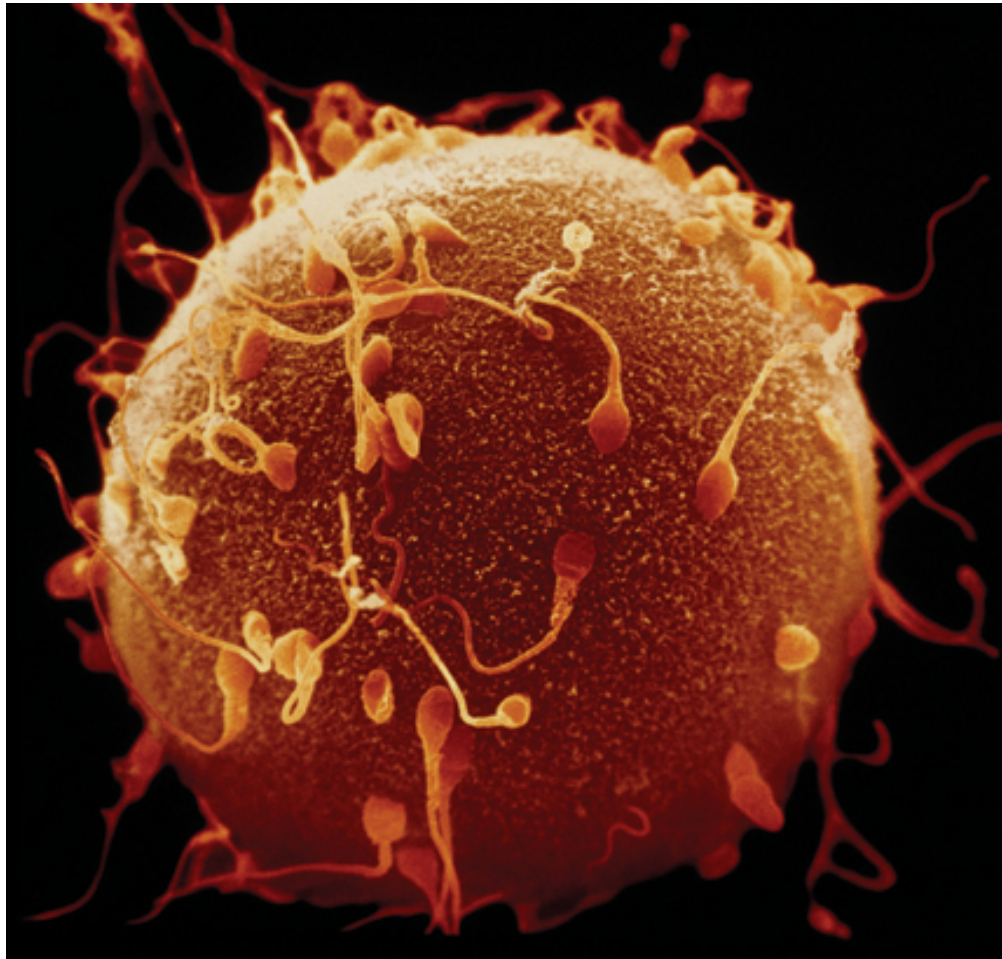


## 6.3 Mendel and Heredity

### 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

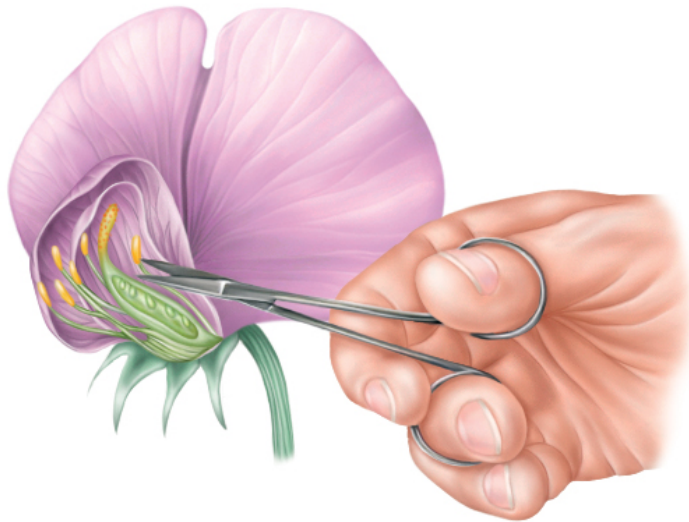
- ▶ **Mendel's data revealed patterns of inheritance.**
  - Mendel made three key decisions in his experiments.
    - use of purebred plants
    - control over breeding
    - observation of seven “either-or” traits



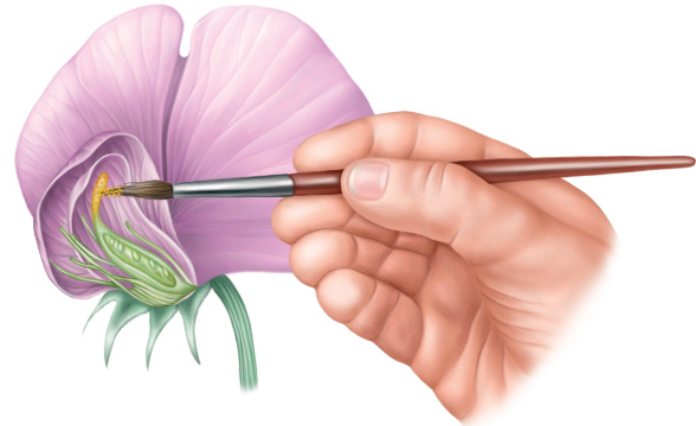


## 6.3 Mendel and Heredity

- Mendel used pollen to fertilize selected pea plants.
  - P generation crossed to produce  $F_1$  generation
  - interrupted the self-pollination process by removing male flower parts



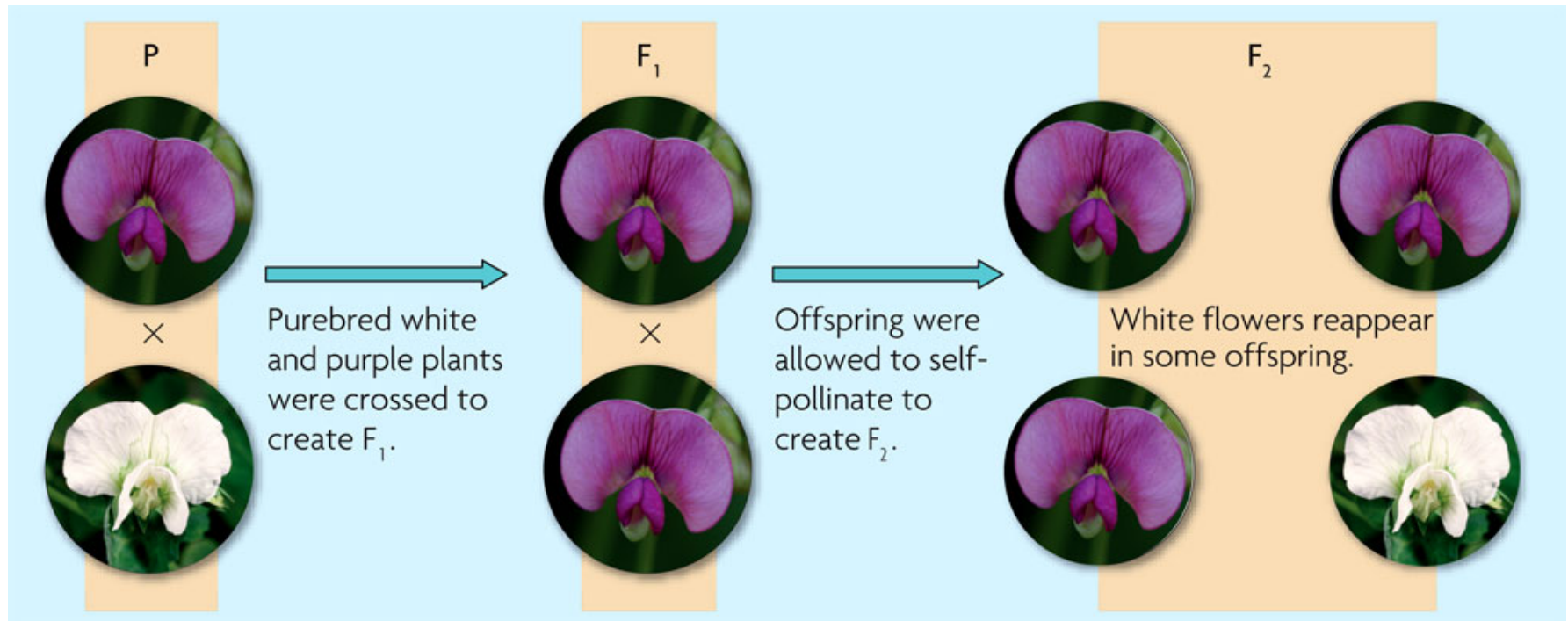
**Mendel controlled the fertilization of his pea plants by removing the male parts, or stamens.**



**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			
F <sub>2</sub> 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.

