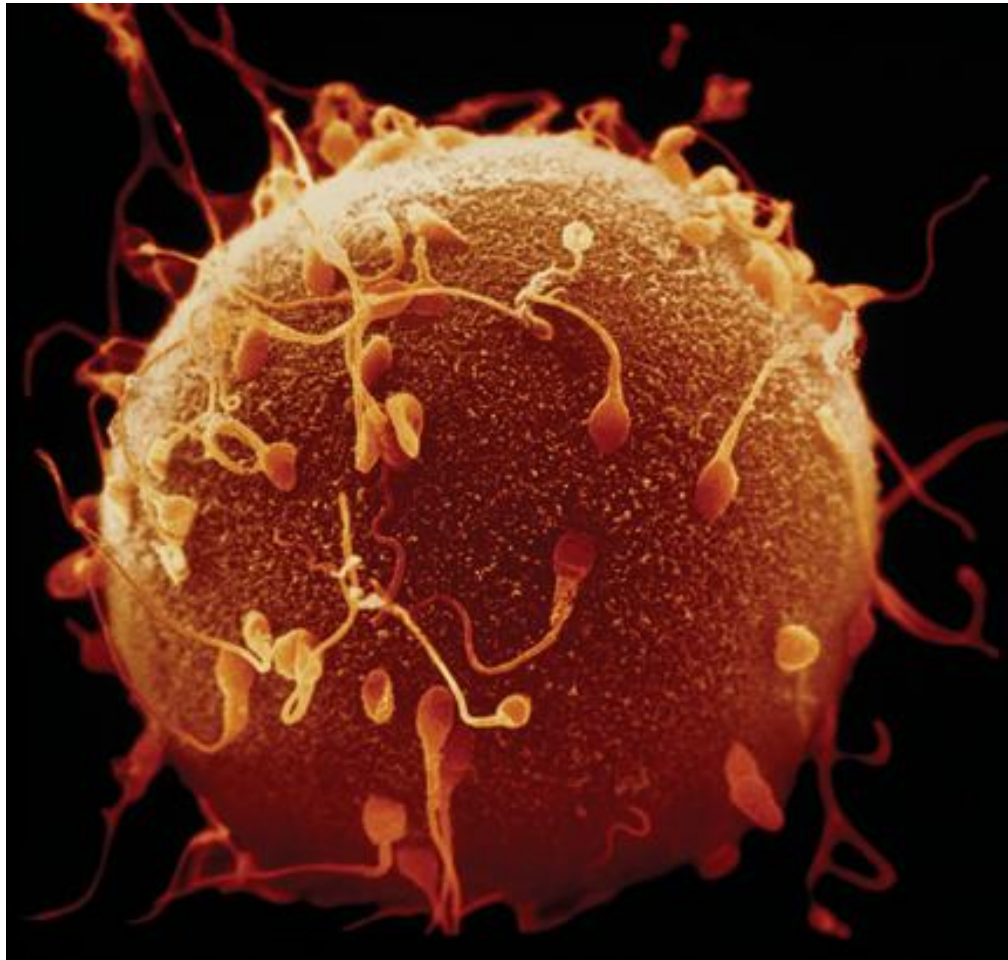


6.3 Mendel and Heredity

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.



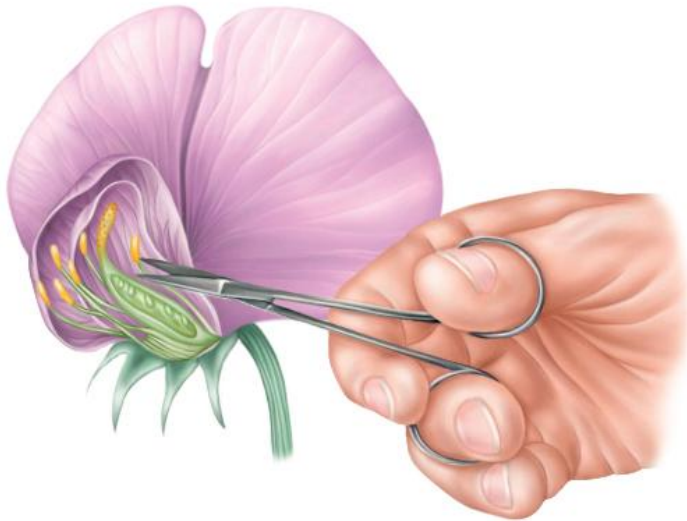
6.3 Mendel and Heredity

- ▶ **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

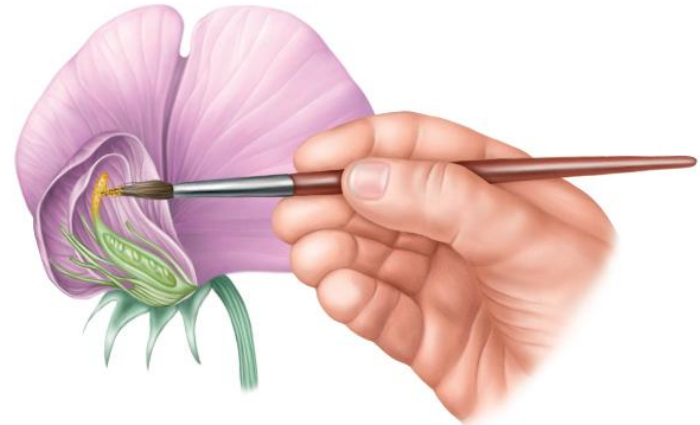


6.3 Mendel and Heredity

- 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



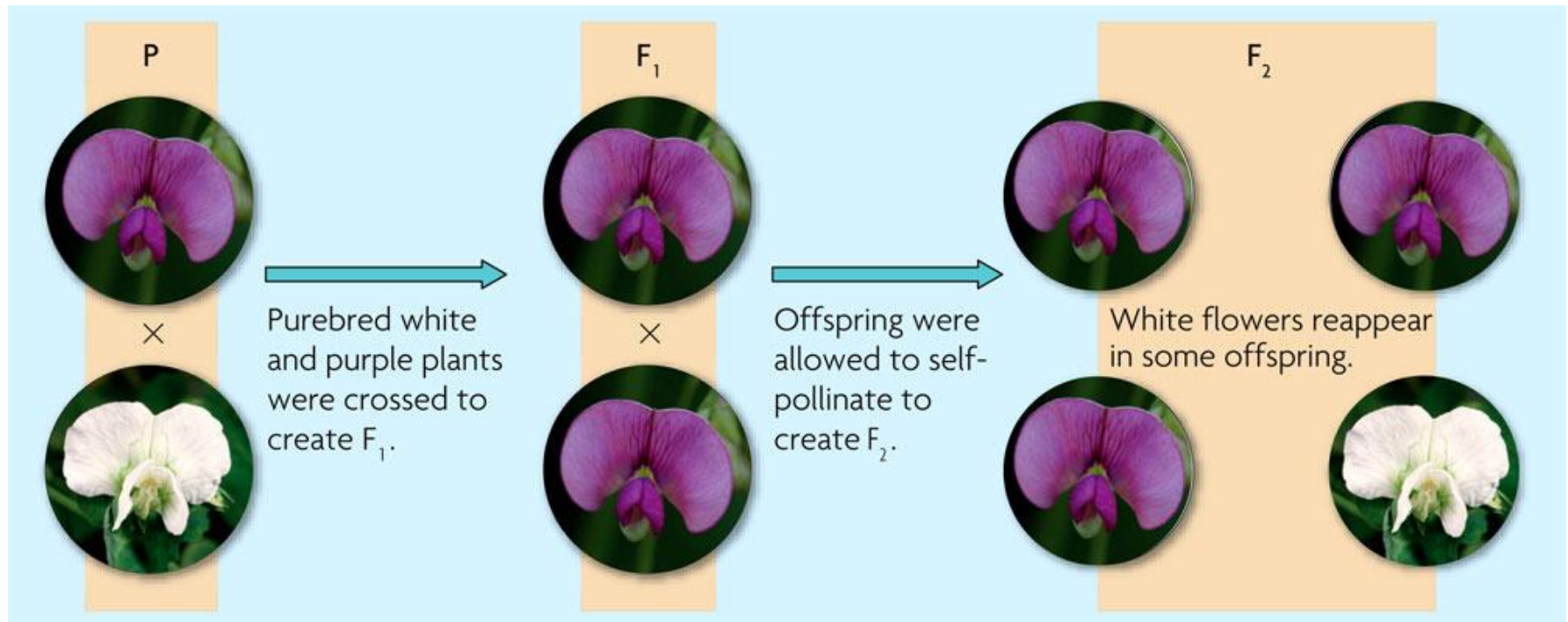
Mendel controlled the fertilization of his pea plants by removing the male parts, or stamens.



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.

