

Reproduction of Flowering Plants

What You Will Learn

- Describe pollination and fertilization in flowering plants.
- Explain how fruits and seeds are formed from flowers.
- List three reasons why a seed might be dormant.
- List three examples of asexual reproduction in plants.

Vocabulary

dormant

READING STRATEGY

Reading Organizer As you read this section, make a table comparing sexual reproduction and asexual reproduction in plants.

Imagine you are standing in a field of wildflowers. You're surrounded by bright colors and sweet fragrances. You can hear bees buzzing from flower to flower.

Flowering plants are the largest and most diverse group of plants. Their success is partly due to their flowers. Flowers are adaptations for sexual reproduction. During sexual reproduction, an egg is fertilized by a sperm.

Fertilization

In flowering plants, fertilization takes place within flowers. *Pollination* happens when pollen is moved from anthers to stigmas. Usually, wind or animals move pollen from one flower to another flower. Pollen contains sperm. After pollen lands on the stigma, a tube grows from each pollen grain. The tube grows through the style to an ovule. Ovules are found inside the ovary. Each ovule contains an egg. Sperm from the pollen grain move down the pollen tube and into an ovule. Fertilization happens when a sperm fuses with the egg inside an ovule.

Figure 1 shows pollination and fertilization.

Figure 1 Pollination and Fertilization

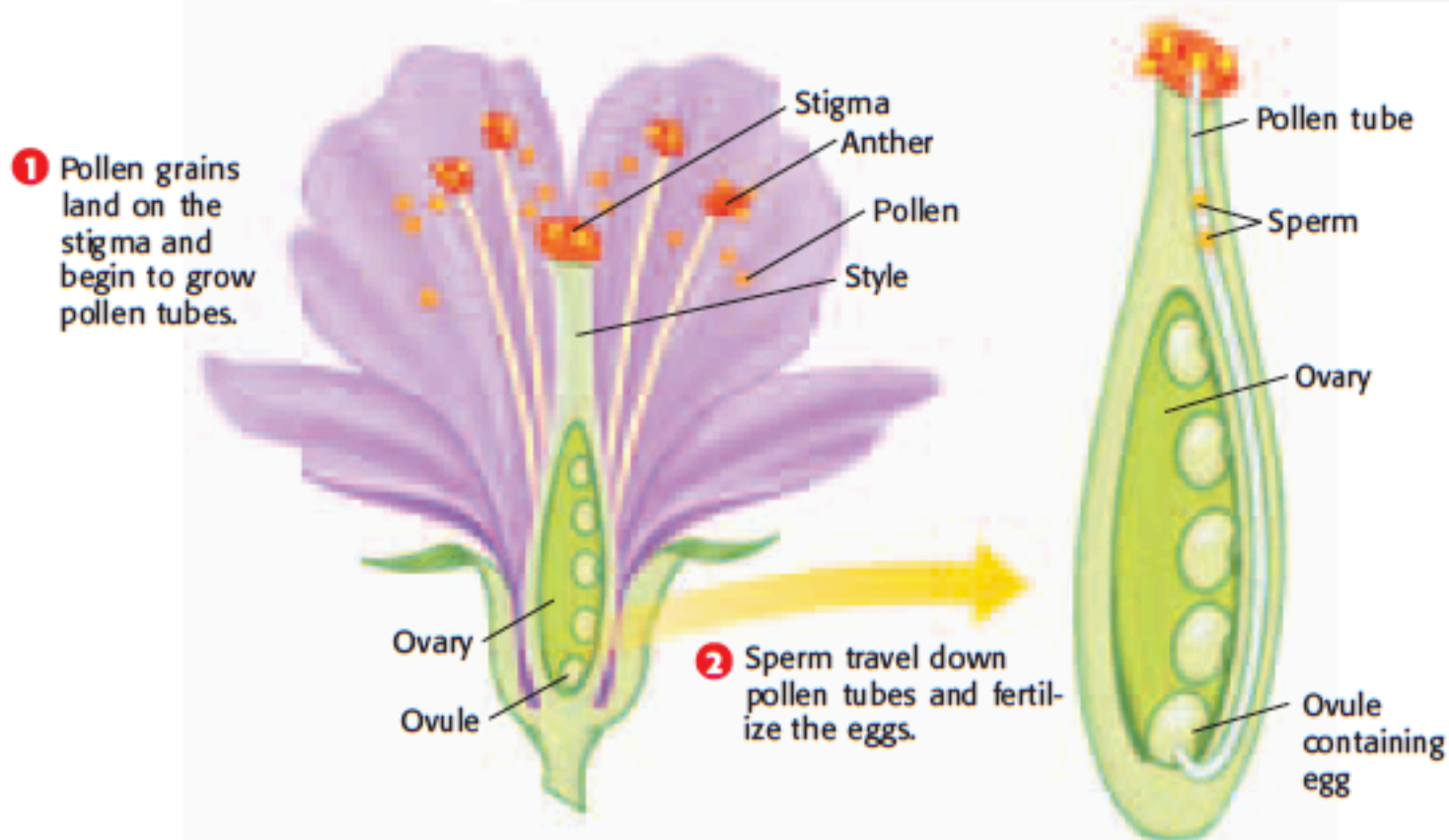
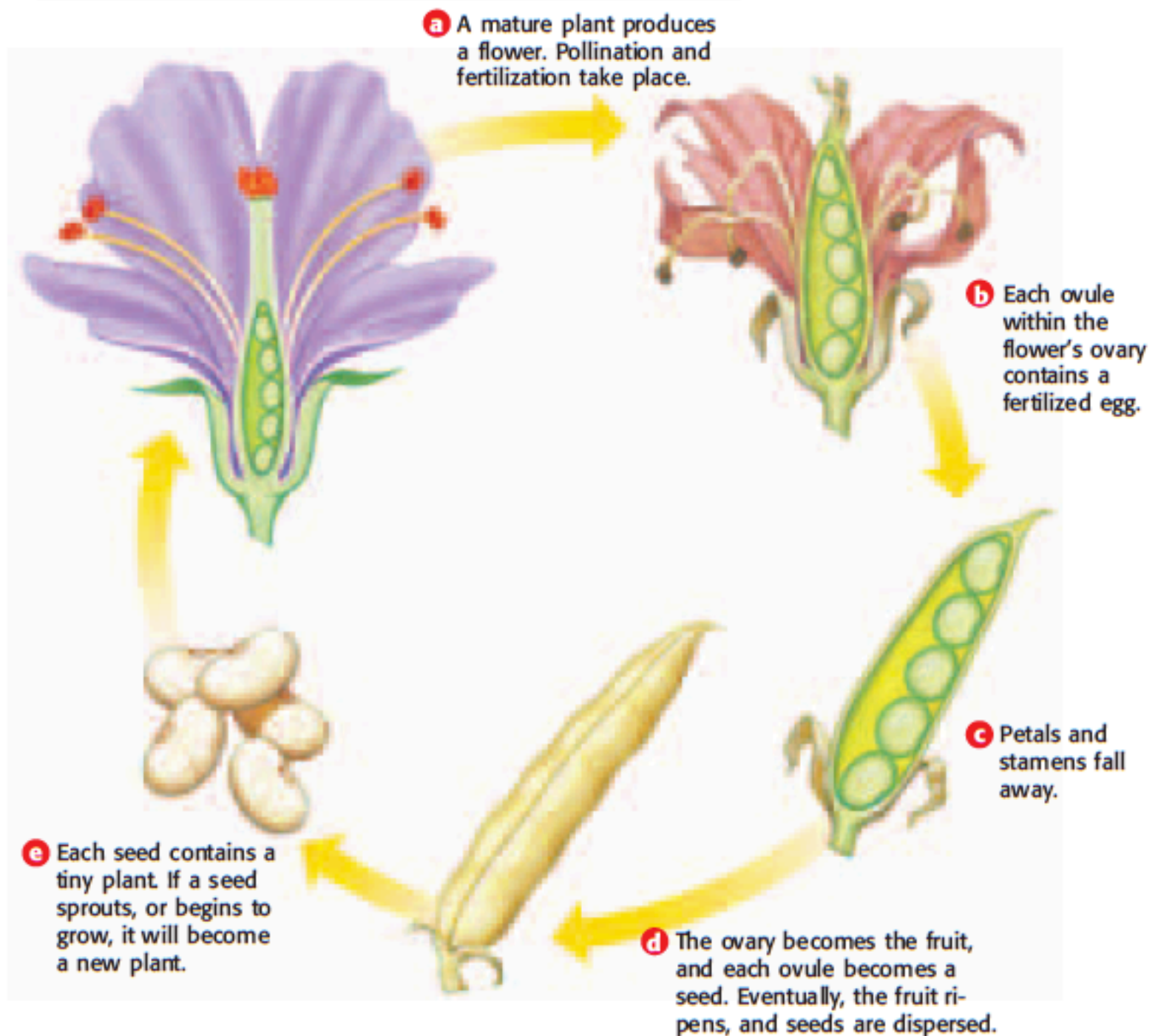


Figure 2 Seed Production



From Flower to Fruit

After fertilization takes place, the ovule develops into a seed. The seed contains a tiny, undeveloped plant. The ovary surrounding the ovule becomes a fruit, as shown in **Figure 2**.

As a fruit swells and ripens, it protects the developing seeds. **Figure 3** shows a common fruit. Fruits often help a plant spread its seeds. Many fruits are edible. Animals may eat these fruits. Then, the animals discard the seeds away from the parent plant. Other fruits, such as burrs, get caught in an animal's fur. Some fruits are carried by the wind.

✓ Reading Check How do fruits help a plant spread its seeds? (See the Appendix for answers to Reading Checks.)

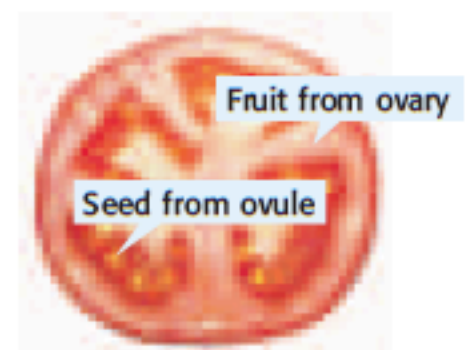


Figure 3 Tomatoes develop from a flower's ovary and ovules.

Figure 4 Seeds grow into new plants. The roots begin to grow first. Then, the shoot grows up through the soil.



dormant describes the inactive state of a seed or other plant part when conditions are unfavorable to growth

Quick Lab

Thirsty Seeds

1. Fill a Petri dish two-thirds full of water, and add six dry bean seeds. Using a wax pencil, label the dish "Water."
2. Add six dry bean seeds to a dry Petri dish. Label this dish "Control."
3. The next day, compare the size of the two sets of seeds. Record your observations.
4. What caused the size of the seeds to change? Why might this be important to the seed's survival?

From Seed to Plant

Once a seed is fully developed, the young plant inside the seed stops growing. The seed may become dormant. When seeds are **dormant**, they are inactive. Dormant seeds often survive long periods of drought or freezing temperatures. Some seeds need extreme conditions, such as cold winters or forest fires, to break their dormancy.

When seeds are dropped or planted in a suitable environment, the seeds sprout. To sprout, most seeds need water, air, and warm temperatures. Each plant species has an ideal temperature at which most of its seeds will begin to grow. For many plants, the ideal temperature for growth is about 27°C (80.6°F). **Figure 4** shows the *germination* (juhR muh NAY shuhn), or sprouting, of a bean seed.

Other Methods of Reproduction

Flowering plants may also reproduce asexually. For asexual reproduction, plants do not need flowers. Part of a plant, such as a stem or root, produces a new plant. The following are three structures plants use to reproduce asexually:

- **Plantlets** Tiny plants grow along the edges of a plant's leaves. These plantlets fall off and grow on their own.
- **Tubers** Underground stems, or tubers, can produce new plants after a dormant season.
- **Runners** Above-ground stems from which new plants can grow are called *runners*.

You can see an example of each kind of asexual reproduction in **Figure 5**.


 **Reading Check** What are three structures plants use to reproduce asexually?

Figure 5 Three Structures for Asexual Reproduction



Kalanchoe plants produce **plantlets** along the edges of their leaves. The plantlets eventually fall off and root in the soil to grow on their own.



A potato is a **tuber**, or underground stem. The "eyes" of potatoes are buds that can grow into new plants.



The strawberry plant produces **runners**, or stems that grow horizontally along the ground. Buds along the runners take root and grow into new plants.

SECTION Review

Summary

- After pollination, a pollen tube forms from the stigma to an ovule. This tube allows a sperm to fertilize an egg.
- After fertilization, seeds and fruit form. The seeds are protected by fruit.
- A dormant seed can survive drought and freezing temperatures. Some seeds need extreme conditions to break their dormancy.
- Some plants use plantlets, tubers, or runners to reproduce asexually.

Using Key Terms

- In your own words, write a definition for the term *dormant*.

Understanding Key Ideas

- Pollination happens when
 - a pollen tube forms.
 - a sperm cell fuses with an egg.
 - pollen is transferred from the anther to the stigma.
 - None of the above
- Which part of a flower develops into a fruit? into a seed?
- Why do seeds become dormant?
- Describe how plants reproduce asexually.

Math Skills

- A seed sprouts when the temperature is 27°C . If the temperature is now 20°C and it rises 1.5°C per week, in how many weeks will the seed sprout?

Critical Thinking

- Making Inferences** What do flowers and runners have in common? How do they differ?
- Identifying Relationships** When might asexual reproduction be important for the survival of some flowering plants?
- Analyzing Ideas** Sexual reproduction produces more genetic variety than asexual reproduction. Why is variety important?

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