

25-A Flower and Plant Reproduction

Flowers, the harbingers of spring and the glory of gardens, are the reproductive organs of plants known as angiosperms. Angiosperms are among the most advanced plants on Earth. They first appeared more than 100 million years ago, during the time of the dinosaurs.

Flowers are complex structures incorporating both reproductive and sterile tissue. They may be perfect, which in botany means having both male and female organs, or they may be imperfect and contain only one type of organ. The showiest part of the flower, the splash of color often visible from far away, is the corolla, the spiraling cluster of petals whose color, scent, and shape serve to attract potential pollinators-usually insects. The male element, or stamen, is comprised of filaments, each of which supports an anther where the grains of pollen develop. The female elements include the pistil, the seed-bearing organ of the flower.

The flower is the angiosperm's evolutionary solution to reproduction in waterless conditions. No water from any source is necessary to transfer the male gamete, the pollen, to the female gamete, the ovule inside the pistil. A flower begins as a bud, which eventually breaks free of its protective wrapping, the sepals. The corolla, which always has at least three petals, opens wide to the sun and the atmosphere, and the male and female gametes develop and prepare for pollination. During pollination, pollen is moved from the anther on the stamen to a receptive stigma, the opening at the top of the pistil. Once the pollen reaches and fertilizes the ovule, a zygote is formed. The tissues of the zygote begin to differentiate, and the result is a seed, which consists of a plant embryo encased in a protective structure. One fertilized ovule becomes a single seed.

It is often best for flowers to cross-pollinate, or be fertilized by pollen produced by a different bloom. Although this is not a problem in imperfect flowers, in a perfect flower there are several mechanisms that discourage self-pollination. The pollen may mature at a rate different from that of the ovule. The anthers may tip away from the pistil, or the shape of the flower may be suited only to a single pollinator.

Flowers have co-evolved with insects for millions of years. The features that people find so pleasing in flowers-shape, color, and fragrance-often have developed to lure specific types of pollinating insects.

Reading Time _____

Recalling Facts

1. _____ are the reproductive organs of _____.
 - a. Flowers, angiosperms takes place
 - b. Angiosperms, flowers
 - c. Pistils, flowers
2. Which of the following is *not* true of a perfect flower?
 - a. It includes male and female organs.
 - b. It includes only female organs.
 - c. It cannot be self-pollinating,
3. The _____ protect the flower bud as it develops.
 - a. anthers
 - b. corollas
 - c. sepals
4. Which of the following statements is true?
 - a. As angiosperms have evolved, their flowers have become more beautiful.
 - b. Many flowers have evolved to attract specific pollinators.
 - c. Perfect flowers usually self-pollinate.
5. During pollination, pollen is transferred to
 - a. a stamen.
 - b. a sepal.
 - c. a receptive stigma

Understanding Ideas

6. From the information in the article, you can conclude that pollination takes place
 - a. before the ovule can be fertilized.
 - b. before the flower has bloomed.
 - c. several times in each flower.
7. In flowers the male gametes are grains of pollen, just as in humans the male gametes are
 - a. red blood cells
 - b. sperm
 - c. testosterone

8. You can infer from the article that a decline in the population of a pollinator could result in

- a. a decline in the number of flowers that depend on it.
- b. a decline in the population of other pollinators.
- c. an increase in the number of flowers produced.

9. If pollination does not take place,

- a. a flower becomes even more fragrant.
- b. the plant soon dies.
- c. no seeds are formed.

10. The reproductive tissue of a flower includes the

- a. stigma, anthers, and sepals.
- b. pistil, anthers, and petals
- c. stigma, pistil, and anthers

25-B Flowers of the Desert

Much of the southwestern United States is a rocky desert of dull mauves, greens, and browns. Its arid environment seems to preclude the possibility of brilliant color. Following the rare cloudbursts that provide most of the annual rainfall in that area, however, springtime draws from the parched sands a spectacular floral array.

Perennial plants native to the desert survive for months at a time in the absence of any measurable precipitation. Shrubs such as brittle bush and desert mallow have extensive networks of roots that absorb every available drop of water from the soil. Plants called succulents, which include cacti, have thick spongy stems that absorb and store water in defense against long dry spells. They offer a magnificent display in the spring--creamy blooms from the saguaro, the prickly pear's showy yellow flowers, and the scarlet blossoms on a barrel cactus. The desert's great glory, however, is its profusion of annual flowers.

Desert annuals germinate from heat- and drought-resistant seeds lying dormant in the soil. Desert marigolds, camphor weed, and desert blazing are the yellow of sunshine. Lavender and blue Mojave asters, desert lupines, and machaeranthera mirror the sky, and Mexican gold poppies and ocotillo paint touches of fiery orange and red. These and other annuals, such as ghost flowers with their purplish centers, saucer-shaped dune evening primroses, and pink sand verbenas, bring a riot of color to the desert landscape just as late winter becomes early spring.

1. Recognizing Words in Context

Find the word *preclude* in the passage. One definition below is closest to the meaning of that word. One definition has the opposite or nearly opposite meaning. The remaining definition has a completely different meaning. Label the definitions C for *closest*, O for *opposite or nearly opposite*, and D for *different*.

- a. prevent
- b. enable
- c. include.

2. Distinguishing Fact from Opinion

Two of the statements below present *facts*, which can be proved correct. The other statement is an *opinion*, which expresses someone's thoughts or beliefs. Label the statements F for *fact* and O for *opinion*.

- a. The muted colors of the desert landscape are dull and lifeless.
- b. In the spring, desert wildflowers bloom in a variety of colors.
- c. Many kinds of plants can grow in the desert.

3. Keeping Events in Order

Label the statements below 1, 2, and 3 to show the order in which the events happen.

- a. Spring storms bring rain to the desert.
- b. During the same year, wilting ocotillo drop seeds onto the desert soil.
- c. Rainwater activates dormant seeds and lupines, marigolds, and ocotillo bloom.

4. Making Correct Inferences

Two of the statements below are correct *inferences*, or reasonable guesses. They are based on information in the passage. The other statement is an incorrect, or faulty, inference. Label the statements C for *correct* inference and F for *faulty* inference.

- a. Succulents include many kinds of cactus.
- b. Desert plants flower when there is adequate precipitation.
- c. Desert soil is not fertile enough to grow many kinds of plants.

5. Understanding Main Ideas

One of the statements below expresses the main idea of the passage. One statement is too general, or too broad. The other explains only part of the passage; it is too narrow. Label the C statements M for *main idea*, B for *too broad*, and N for *too narrow*.

- a. Both perennial and annual flowers bloom profusely in the Southwestern desert in the spring.
- b. The seeds of desert annuals lie dormant in the soil until rain allows them to germinate.
- c. Some plants can grow in inhospitable environments.

Correct Answers, Part A

Correct Answers, Part B

Total Correct Answers 1