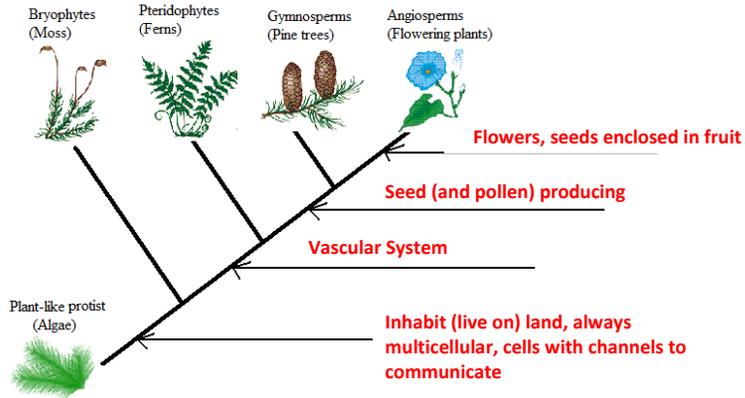


Plant Review Worksheet Part 2 | Gymnosperms & Angiosperms

KEY

1. Fill in arrows on the cladogram below with **characteristics/traits** that show how plants evolved over time:



2. Fill in the following table:

Plant Category	Examples of plants	Defining characteristics	Dominant Phase?
Seed producing (cones) Gymnosperms	Conifers Cycads Ginkgos	Has seeds, has vascular system, DOES NOT need water to reproduce, seeds partially protected by cones, cone is reproductive structure	Sporophyte
Seed producing (flowers) Angiosperms	Lillies, apple trees, orange trees, daisies, etc (anything with flower/fruit)	Has seeds, vascular system, does not need H ₂ O to reproduce, seeds protect and nourish embryo (endosperm), flower is reproductive structure	Sporophyte

3. Place the steps of the conifer life cycle in order, from the step started for you:

- 1 Male and female cones grow into mature sporophytes.
- 6 Seeds land and the seedling grows into sporophyte (cycle repeats).
- 5 After seeds harden, cone opens and seeds are released.
- 2 Pollen grains are released from male cones and sticks to female ovule.
- 4 One sperm nuclei fertilizes the egg and a diploid embryo develops.
- 3 Pollen tube grows from male spore (pollen) and 2 sperm nuclei travel down to egg

4. What are the two ways pollination occurs in flowering plants?

- a. Wind
- b. Animals

5. What is a fruit? Mature flower ovary

- a. What is the role of fruit? (list 2 things) Seed dispersal and protection.

6. Botanists classify flowering plants into two groups based on their # of cotyledons

7. For the following pictures and descriptions write "M" for monocot or "D" for dicot:

Netlike veins



D

Flower parts in multiples of three



M

Scattered vascular tissue



M

Two cotyledons



D

Flower parts in multiples of four or five



D

One cotyledon



M

Parallel veins



M

Ringed vascular tissue



D

8. Match the following plant life spans with their correct definition:

b. Biennials Plants that take 2 years to complete their life cycle.

c. Perennials Plants that live for more than 2 years

a. Annuals Plants that mature from seeds, produce flowers, and then

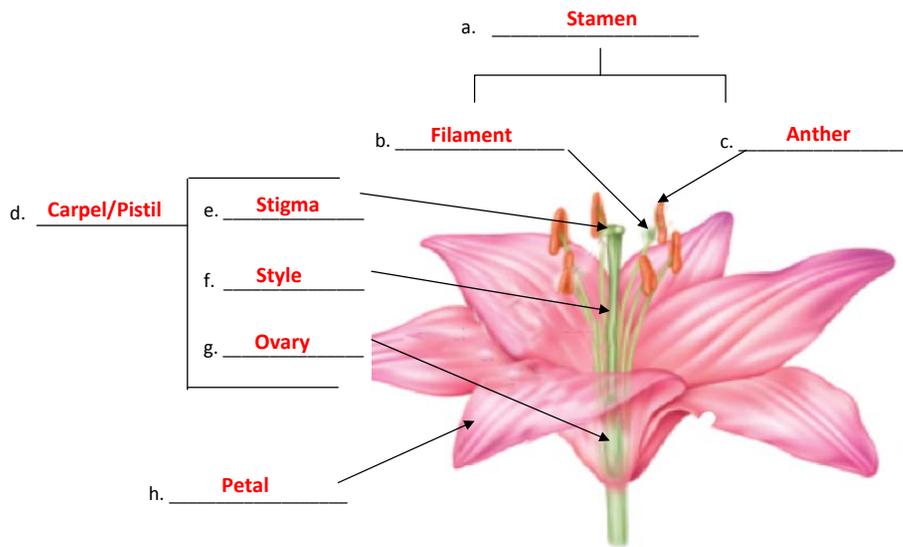
die all in one year.

- a. Annuals
- b. Biennials
- c. Perennials

9. What is an endosperm (why is it an advantage for plants with seeds)?

The food source for the developing plant embryo; it's an advantage because the seeds survive longer periods of time.

10. Label the flower's structures:



11. Fill in the blanks:

The outermost layer of a flower is made of sepals, which protect the flower. Just inside the outermost layer is another layer of modified leaves called petals, which can be brightly colored to attract pollinators. Most flowers have both male and female structures. A stamen is the male structure of a flower and it has a stalk called a filament. This stalk supports an anther, which produces the male gametophytes: pollen grains. The innermost part of the flower is the female structure called the carpel. Each female structure has three parts. The stigma is the top part that is sticky and holds the pollen grains when they land there. The style is the tube that leads from the top part of the carpel to the base of the flower. This is called the ovary, and it is where female gametophytes (eggs/ovules) are produced.

12. What is double fertilization? What two things are produced as a result?

When one sperm fertilizes the egg = zygote, and the other sperm fuses with the two polar nuclei = triploid (3n) endosperm.

13. Answer the following questions about the angiosperm's male gametophyte:

- a. Cells in the anthers produce haploid spores (pollen). This means the spores are created by:
 (circle one) mitosis or **meiosis**
- b. The nucleus in the pollen grain divides by mitosis to make 2 sperm nuclei. Each nuclei is:
 (circle one) **haploid** or diploid

14. Place the steps of the angiosperm life cycle in order, from the step started for you:

- 1 Pollen lands on the stigma = pollination.
- 3** The sperm travel down the pollen tube.
- 6** Each ovule becomes a seed and the surrounding ovary grows into a fruit.
- 2** One haploid nucleus of pollen grain forms the pollen tube. The other haploid cell forms 2 sperm nuclei.
- 5** A triploid (3n) endosperm forms.
- 7** Seeds get dispersed.
- 8** Seed germinates, and the cycle starts over.
- 4** One sperm fertilizes the egg and the other joins with the 2 polar nuclei.

15. Compare and contrast the following types of seed producing plants:

