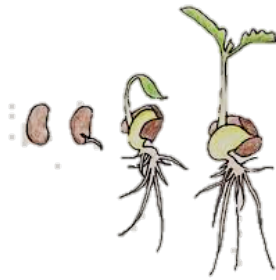


I. When you see a new plant emerge from the ground, think about the many earlier events that formed a tiny new plant



with the energy to grow out of a **seed** in darkness. **Seeds** are formed by **flowers**, the sexual reproductive parts of plants. Prior to forming **seeds**, one or more female egg cells are formed in the female ovary deep inside a flower. Male sperm cells are formed in pollen grains that are held by anthers out and away from the ovary. Flowers have no way to deliver the male cells to the female cells, but rely on animals or wind to move pollen around. “The birds and the bees”, get most of the credit for **pollination**. **Pollination** is also done by many other animals and by the wind. The ovary extends out and forms a sticky stigma that will hold any pollen that bumps against it. Plants have evolved to use one type of pollinator and usually have structures that result in getting the pollen to a different flower. An example is

when a bee gathers sunflower pollen for food, the bee goes to multiple sunflowers and as it goes, accidentally leaves pollen from a previous flower.

If the pollen is a match for the flower, and accepted, it will then form a pollen tube and take the sperm cell to the ovary and egg cell for **fertilization**. If **fertilization** (combining of the egg and sperm) occurs, then multiple cell divisions form the new embryo plant. A protective seed coat forms around the embryo and a food supply to form a **seed**. Simultaneously, the ovary enlarges around the **seed** and becomes a **fruit**. The **fruit** then provides protection for the new **seed** and is used as a **seed dispersal** (scattering) vehicle. Edible fruit may attract animals as a food source and seeds are left accidentally or as waste along the way. Dry fruit may attach to animals as hitch-hikers or blow in the wind. Some fruit floats in water. Some just “pop” and seeds scatter from the explosion.

Seed dispersal is successful for those seeds that end up in a place to grow. A small percentage of seeds eventually end up where they have the requirements for **germination**. Initially they need space water, oxygen and a suitable temperature for **germination**. They will then use their stored food for cellular **respiration** during the subsequent **germination**. The new plant emerges out of the dark using the stored food for energy. Very soon the stored food will run out. The new plant needs to get to the sun’s energy rays and start the process of **photosynthesis**. As it grows, the plant uses **photosynthesis** to make its food and continues to carry on **respiration** to use that food for energy. Eventually the plant matures and produces reproductive **flowers**. **Pollination** follows and the cycle repeats for any seed lucky enough to find a niche before it becomes a producer for some hungry herbivore.

II. Use the terms below to complete the sentences:

1. **During** germination, the embryo uses stored food for energy, a process called _____.
2. Reaching light, the new plant can **proceed** to _____ and make food for growth.
3. Reproductive structures called _____ form **after** the plant matures.
4. **Before** fertilization of the egg is possible, _____ is **required** to move the male pollen.
5. **Subsequent** to seed and fruit formation, the fruit becomes the vehicle for seed _____.

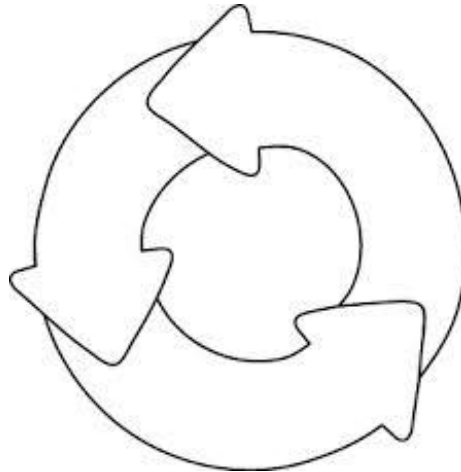
photosynthesis respiration

flowers

pollination

dispersal

III. Diagram the Plant Cycle by placing the images and labels in order around the arrows.
If needed, ask to print and then cut and attach parts to another page with FLAPS of tape.



Pollination

Respiration

Photosynthesis

Mature Plant

Germination

Seed Dispersal

Fertilization

Flower Formation

Fruit and Seed Formation

