BOTANY, PLANT PHYSIOLOGY AND PLANT GROWTH
Lesson 6: PLANT PARTS AND FUNCTIONS
Part 4 - Flowers and Fruit

Script to Narrate the PowerPoint, 06PowerPointFlowers and Fruit.ppt
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PowerPoint Slide 1: Title Slide,
"Plant Parts and Functions, Part Four: Flowers and Fruit

PowerPoint Slide 2: "Roots anchor the plant; flowers and fruit perpetuate the species." We will review the importance of roots and discuss the differences with flowers and fruits.

PowerPoint Slide 3: "Let's review the importance of roots".

PowerPoint Slide 4: Roots are either a taproot or fibrous root in structure.

PowerPoint Slide 5:
Tree roots extend beyond drip line. Most roots occur in top 1" of soil.

PowerPoint Slide 6:
Parts of the roots – read slide.

PowerPoint Slide 7:
Roots as food crops – read slide.

PowerPoint Slide 8:
Segment One - Flowers.

PowerPoint Slide 9:
Parts of the flower.
The classification of plants is based on their flowers and/or reproductive parts. Therefore, knowledge of the flower and its parts is essential for anyone who is interested in plant identification.

As the reproductive part of the plant, the flower contains the male pollen and/or female ovule plus accessory parts such as petals, sepals and nectar glands.

Sepals are small green leaf-like structures on the base of the flower which protect the flower bud. The sepals collectively are called the calyx.

Petals are highly colored portions of the flower. They may contain perfume as well as nectar glands. The number of petals on a flower is often used in the identification of plant families and genera. The petals collectively are called the corolla. Flowers of discots typically have sepals and/or petals in numbers of four, five or multiples thereof. Monocots typically have these floral parts in threes or multiples of three.

The pistal is the female part of the plant. It is generally shaped like a bowling pin and located in the center of the flower. It consists of the stigma, style and ovary. The stigma is located at the top and is connected by the style to the ovary. The ovary contains the eggs that reside in the ovules. After the egg is fertilized the ovule develops into a seed.

The stamen is the male reproductive organ and consists of a pollen sac called the anther and a supporting filament. The filament holds the anther in position so that the pollen it contains may be dispersed by wind or carried away by pollination insects or birds.

PowerPoint Slide 10:
Dioecious p and monoecious plants are different as <u>dioecious plants</u> are staminate plants bear only male flowers and pistillate plants bear only female flowers. Monoecious plants contain both male and female parts on the same plant.

There are plants that bear only male flowers (staminate plants) or bear only female flowers (pistillate plants). Species in which the sexes are separated into staminate an pistilate plants are called dioecious. Most holly trees are either male or female plants, therefore to get berries it is necessary to have a female tree and male tree nearby that will provide pollen. Monoecious plants are one that have separate male and female flowers on the same plant. Corn plants is another example. Some plants bear only male flowers at the beginning for the growing season but later develop both sexes; for example, cucumbers and squash.

Time Check: PowerPoint half-way mark.

⬚   *You should be about 10 minutes into this PowerPoint presentation.*

PowerPoint Slide 11:
How Seeds Form

Pollination is the transfer of pollen from an anther to a stigma. This may occur by wind or by pollinators. Wind pollinated flowers lack showy floral parts and nectar since they don't need to attract a pollinator. Flowers are brightly colored or patterned and contain fragrance or nectar, these pollinators will transfer pollen from flower to flower. Pollen may also be transferred via gravity, splashing water or touch.

The stigma contains a chemical which excites the pollen, causing it to grow a long tube down the inside of the style to the ovules inside every ovary. The sperm is released by the pollen grain and fertilization typically occurs. Fertilization is the union of the male sperm nucleus from

the pollen grain and the female egg found in the ovary. If fertilization is successful, the ovule will develop into a seed.

PowerPoint Slide 12:
Types of Flowers
Solitary flower – one flower per stem
Inflorescence – cluster of flowers

Some plants bear only one flower per stem and are called solitary flowers. Other plants produce an inflorescence, a term that refers to a cluster of flowers and how they arranged on a floral stem.

PowerPoint Slide 13: Segment Two - Fruits

PowerPoint Slide 14:
Parts of a Fruit
Seeds   mature ovule   represent both parents
Ovary wall   fleshy or dry   represents maternal plant

Fruits consist of the fertilized and mature ovules called seeds and the ovary wall that may be fleshy as in the apple or dry and hard as in maple fruit (samara). The only parts of the fruit that are genetically representative of both the male flower and female flower are seeds (mature ovules). The rest of the fruit arises from the maternal plant and is therefore genetically identical to that parent plant. Some fruits have seeds enclosed with the ovary (apples, peaches, oranges, squash and cucumbers). Others have seeds that are situated on the periphery of fruit tissue (corncob, strawberry flesh).

PowerPoint Slide 15:
Types of Fruit

Fruits can be classified as simple, aggregate or multiple. Simple fruits are those which develop from a single ovary. These include cherries and peaches (drupe), pears and apples (pome), and tomatoes (berries). Tomatoes are botanical fruits since they develop from the flower as do squash, cucumber and eggplant. All of these fruits develop from a single ovary. Other types of simple fruit are dry. The fruit wall in these fruits becomes papery or leathery and hard as opposed to the fleshy examples just mentioned. Examples are peanuts (legumes), poppy (capsule), maple (samara), and walnut (nut). An aggregate fruit comes from a single flower which has many ovaries. The flower appears as a simple flower with one corolla, one calyx and one stem but with many pistils or ovaries. Examples are strawberry, raspberry and blackberry. The ovaries are fertilized separately and independently. If ovules are not pollinated successfully, the fruit will be misshapen and imperfect.

Multiple fruits are derived from the tight cluster of separate, independent flowers borne on a single structure. Each flower will have its own calyx and corolla. Examples of multiple fruits are pineapple, fig and the beat seed.

PowerPoint Slide 16
Parts of a Seed
- Embryo
- Endosperm
- Seed Coat

The seed or matured ovule is made up of three parts. The embryo is a miniature plant in an arrested state of development. Most seeds contain a built-in food supply called the endosperm (orchid is an exception). The endosperm can be made up of proteins, carbohydrates or fats. The third part is the hard outer covering called a seed coat, which protects the seed from disease and insects and prevents water from entering the seed and initiation the germination process before the proper time.:

PowerPoint 17.
Review
In this lesson we learned about roots, flowers and seeds.

PowerPoint 18.
Review Parts of a Root
In this lesson we learned about roots, flowers and seeds.

QUESTION: What are the three functions of roots?
STUDENT RESPONSE: Student provides answers. Answers on slide 18.

PowerPoint 19
Review Parts of a Flower

QUESTION: Please define a fruit in scientific terms
STUDENT RESPONSE: Student proved answers. Answers on slide 19.

PowerPoint 20
Definition of Fruit

Fruit consist of:
Fertilized and mature ovules (seeds)
Ovary wall
    Fleshy as in the apple or
    Dry and hard as in maple fruit (samara).

PowerPoint 21
Closure

Roots, flowers and fruit have great importance to the plant in itself in anchoring a plant and in continuing the species. Roots, flowers and fruit also provide countless benefits to the animal kingdom.

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