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 **Modeling Plant Parts in Play-doh Lab**

**50 Points Possible**

**Introduction**

Have you ever wondered if plants were really alive? Indeed they are—plants move materials, grow, repair themselves, and constantly respond to the environment. Their cells and tissues work together in very effective ways. Three principal organs of seed plants are roots, stems, and leaves. The organs are linked together by tissue systems that produce, store, and transport nutrients, and provide physical support and protection.

Plants have three main tissue systems: dermal, vascular, and ground. The two kinds of vascular tissue are xylem, a water-conducting tissue, and phloem, a tissue that carries dissolved food. Xylem tissue carries water up the plant from roots to leaves. Phloem carries food (glucose sugars) down the plant from leaves and the stem to be stored in the roots.

Flowers are reproductive organs composed of four different kinds of specialized leaves: sepals, petals, stamens, and carpels. Sepals enclose the bud before it opens, and they protect the flower while it is developing. Petals, which are often brightly colored, are found just inside the sepals. The colors, number, and shapes of such petals attract insects and other pollinators to the flower.

The stamens are the male parts of the flower—each stamen consists of a stalk called a filament with an anther at its tip. **Anthers** are the structures in which pollen grains—the male gametophytes—are produced. The innermost floral parts are the carpels, which produce and shelter the female gametophytes and, later, seeds. Each carpel has a broad base forming an ovary, which contains one or more ovules where female gametophytes are produced.

The innermost floral parts are the carpels, which produce and shelter the female gametophytes and, later, seeds. Each carpel has a broad base forming an ovary, which contains one or more ovules where female gametophytes are produced. The diameter of the carpel narrows into a stalk called the style. At the top of the style is a sticky or feathery portion known as the **stigma**, which is specialized to capture pollen. Botanists sometimes call a single carpel or several fused carpels a **pistil**.

**Prelab Questions (2 points each)**

1. How do the vascular tissues like xylem and phloem assist the process of photosynthesis?

2. In your own words, explain how complete flowers with both male and female reproductive organs assist in the process of reproduction.

**Materials: *Keep all play dough colors separate!***

1. Ruler
2. Tray
3. Blue play-doh
4. Yellow play-doh
5. Red play-doh
6. Green play-doh
7. Scissors
8. Colored paper for labels
9. Markers/colored pencils for labels

**Activity A: Male Flower Parts – Stamens, Anthers, & Filaments**

 **Procedure:**

1. Using only **blue** play-doh, create 6 small anthers, about the size of a bean.
2. Using only **yellow** play-doh, create 6 skinny filaments that are 3 inches in length.
3. Use more **blue** play-doh to create 3 tiny pollen grains.
4. Gently attach the anthers to your filaments.
5. Lay all items on the flat surface of your tray.
6. Label all items on your tray using scissors, construction paper, and markers/colored pencils.
* Anther
* Filament
* Stamen
* Pollen

**Data Collection & Analysis**

1. What is the purpose of anthers?
2. Why must anthers be attached to a filament?

**Activity B: Female Flower Parts – Carpels, Pistils, Ovaries, Stigmas, & Styles**

 **Procedure:**

1. Using only **red** play-doh, create 1 small stigma.
2. Using only **green** play-doh, create 1 style (5 ½ inches long) and 1 ovary (1 inch attached).
3. Gently attach the stigma to the style.
4. Lay all items on the flat surface of your tray.
5. Label all items on your tray using scissors, construction paper, and markers/colored pencils.
* Carpel
* Pistil
* Ovary
* Stigma
* Style

**Data Collection & Analysis**

1. How does fruit form from the female and male reproductive parts? Describe in detail.

**Activity C: Complete Flower Parts – Petals, Stems, Roots, & Sepals**

 **Procedure:**

1. Using only **yellow** play-doh, create 4 petals (3 inches long).
2. Using only **green** play-doh, create 1 skinny stem (6 inches long).
3. Using more **green** play-doh, create 2 sepals (1 inch long).
4. Using **blue** play-doh, create a root system.
5. Gently attach all pieces.
6. Lay all items on the flat surface of your tray.
7. Label all items on your tray using scissors, construction paper, and markers/colored pencils.
* Petals
* Stem
* Root
* Sepals

**Data Collection & Analysis**

1. Which 2 structures from activity C best helps photosynthesis with its need for water? How do they do this?
2. If this flower were to lose its petals and have a smell like rotting meat, what would this flower depend on to become pollinated for reproduction?