Structure and Function of Seeds and Plants

Lesson Objectives:
- Students will identify the major parts of a plant and describe the function they provide for plant growth and survival
- Students will dissect a seed and make observations about its structure
- Students will compare and discuss how seeds are different than and similar to plants

Teacher Background: Seeds and mature plants require the same resources to grow. However, the way that seeds and plants acquire these resources differ. Since plants do not care for their offspring, seeds are equipped with most everything they need to survive and grow. Mature plants acquire resources from their environment through their roots and leaves. The structure of seeds and plants differ to accommodate these different means of resource acquisition.

Target Grade Level: K-2

Common Core State Standards:

<table>
<thead>
<tr>
<th>Standards</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>K-LS1-1 (1 &amp; 2)</td>
<td>15 minutes</td>
</tr>
<tr>
<td>1-LS1-1 (1 &amp; 2)</td>
<td>10 minutes</td>
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<tr>
<td>1-LS3-1 (1 &amp; 2)</td>
<td>10 minutes</td>
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<tr>
<td>2-LS2-1 (2)</td>
<td>35 minutes total</td>
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Materials:
- Vegetable and/or flower seeds
- Small plant or picture of plant (same type as the seeds, if possible)
- Bean seeds-dry and some soaked in water for 1+hr (for dissection)
- Potting soil
- Planter cups with lids

Engage: Ask students:
- Who has a garden? What do you grow in your garden?
- What do plants need to grow? Soil, water, sun, air (write on board)

Explore: Parts of a plant. What do most plants have? Discuss findings.
- Have students draw a plant and label the parts-what did most students draw?
- Look at a plant and discuss

Explain: Parts of a plant
- Act out the different functions that each part of the plant provides
  - Roots-Anchor
    - Everyone dig your feet into the ground. If I were to come around and pull on you, it would be hard to lift you.
Plant the seeds!

- Roots also gather water and other nutrients (vitamins & minerals) from the soil.
- Stem: Provides support and water transport
  - Everyone stand tall and strong. If I were to come around and gently push you, you wouldn’t break.
  - Stems also take water from the roots, just like a straw. Make slurping sounds.
- Leaves: Gather sunlight & air
  - Take a deep breath in and blow it out.
- Flowers: Some plants have flowers. This helps them look pretty and attract pollinators. Pollinators drink the nectar (sugar water) from the flowers.
  - Everyone look really pretty to attract insects. Smile :)

Elaborate: Parts of a seed (See below)

Pass out seeds. Seeds eventually grow into plants. How is a seed different than a plant? Take a closer look...

- Compare and contrast a seed to a plant
  - Do the seeds have roots? If not, how do they get water?
  - Do the seeds have a stem?
  - Do the seeds have leaves?
  - Do seeds need water and sunlight?
- Seeds need the same things to survive as a plant, but seeds are “born” with almost everything they need to survive. Let’s take a closer look:
  - Compare the dry seeds with the seeds soaked in water. How are they different? The water-logged seed should be much bigger (large white bean seeds work really well)
    - Seeds don’t have roots to suck up water. So instead there is a small opening that lets water in.
  - Seed coat: Use finger to scrape away protective coating.
    - Seeds have a protective layer to help them stay warm and safe—just like wearing a jacket or helmet.
  - Food Store: Open up the seed
    - Seeds do not need roots and leaves to gather food. Instead, the seed has all of the food it needs inside the seed coat (this is why birds, animals and humans eat seeds)
  - Baby plant (embryo). Inside the seed is a baby plant. (Maple tree seeds have a green embryo that is very easy to see). As the seed matures, the baby plant will eventually grow into an adult plant.

Evaluate: Plant the seeds!

- Review with students what plants (and seeds) need to survive:
  - Soil: Fill cup with loose soil. Using finger, make a small hole in soil. Place seeds in hole. Cover hole with soil
  - Water: Add small amount of water to cup. (This will also encourage condensation)
  - Air: Make sure students don’t compact soil too much.
  - Sun: Place near window or in a well-lit area