



# Answer Key for Modeling Absorption in Plants (second—third grade)

This handout provides sample responses to support discussions following video observations on how children explore living things and how educators use the M<sup>5</sup> Early STEAM Approach to support children's investigations.



## Video:

[Modeling Absorption in Plants \(second—third grade\)](#)

[Modeling Absorption in Plants \(second—third grade\) – Audio Descriptive Version](#)

## Slide 22: Discuss: Investigating Living Things

**In what ways are children investigating living things?**

### Possible Responses

- Children investigate living things by modeling the way a plant's roots absorb water using paper towels.
- Children dip a paper towel in water three different times and measure the height that the water climbs up the paper towel during each of the three trials. Children graph their measurements and interpret what this indicates (or shows) about how plants absorb water.



**What concepts and phenomena might children be learning about?**

### **Possible Responses**

- Children learn about the way plants absorb nutrients and water from the soil. They consider concepts like gravity and how transpiration allows water to move up a plant's stem against gravity.
- Children learn about the needs of living things and consider the effects of frequent rain or overwatering.

**What inquiry skills (for example, observing, measuring, collecting data, interpreting data, testing ideas) do children use when investigating these concepts?**

### **Possible Responses**

- Children observe the way water moves up a paper towel. They add precision to their observations by measuring the height at which the water moves up.
- Children test ideas about how water moves up a plant stem by creating a model of a plant stem with a paper towel.
- Children collect data. They record the measurements during the three different trials.
- Children represent their data by creating a line graph to show how high the water travels at the different intervals.
- Children interpret data and communicate their understanding. Children make meaning of their line graph by discussing what they notice and connecting it back to their knowledge of plants. For example, they talk about how the plant was very "thirsty" during the first trial so the water moved up a lot. Then, during the second and third trials, the plant was less "thirsty" so the water did not move up as much.



## Slide 30: Discuss: Supporting Children to Investigate Living Things

In what ways did the educator use the M<sup>5</sup> practices to support children to investigate and learn about living things?

### Mutual Learning

**In what ways is the educator responsive to children's abilities, interests, or lived experiences?**

#### Possible Responses

- The educator connects to children's prior knowledge of gravity by reminding them of a previous unit they explored in the classroom. She connects the new concept of transpiration in plants to their understanding of gravity.
- The educator connects to children's lived experiences by relating the way a plant absorbs water to the feeling of being thirsty and needing a drink.
- Throughout the experience, the educator observes children and notices when children need additional support. For example, when counting by fourths during the graphing experience, the educator notices a child counting incorrectly and pauses to address their mistake.
- The educator encourages children to interpret the data in the graph. By asking children to explain what they notice, the educator is able to learn about children's understanding of the concepts.



## Meaningful Investigations

**In what ways does the educator offer meaningful investigations?**

### Possible Responses

- The educator provides a meaningful hands-on investigation using paper towels to model the way plants absorb water.
- The educator provides meaningful ways for all children to participate in the experience. Each child in the group had a role. Children remained engaged and thinking throughout the experience because they each had an active role.
- This experience is meaningful because it is connected to a real-world question of interest—how do plants absorb nutrients and water?

## Materials and Learning Environment

**In what ways does the educator provide materials and a learning environment that support children to explore living things?**

### Possible Responses

- The educator provides simple, everyday materials (for example, water and a paper towel) for children to use as a model for a plant stem.
- The educator provides tools (for example, a ruler) for children to observe, measure, and document the way the water level changes over time.
- The educator created a graph with children using a large piece of chart paper and different colored markers to create the points and lines. These different colors and the use of a graph created by the whole group allowed children to compare the results of each team's investigation.



## Mindful Vocabulary and Discourse

**In what ways does the educator support children's science vocabulary and engagement in discourse about living things?**

### Possible Responses

- The educator intentionally introduces new vocabulary, for example, absorption and transpiration. She uses a diagram to illustrate the meaning of this new term. She also connects the new term (transpiration) to a familiar term (gravity) that children had learned about previously. Connecting new vocabulary with words children already know supports comprehension.
- The educator asks open-ended questions to encourage children to explain their thinking. For example, when interpreting the line graph, the educator asks, "What do you think about the time between [timepoint] two and [timepoint] three?"
- The educator encourages children to work in collaborative groups and assigns each child a role within the group. Using groups and intentional collaboration provides children opportunities to engage in discourse about what they are learning. For example, we notice children discussing their measurements and using fraction words to describe what they observe about the distance the water travels up the paper towel.



## Multiple Representations

**How does the educator provide different ways for children to explore and express their ideas about living things?**

### Possible Responses

- The educator encourages children to explore the concept of transpiration through a hands-on investigation. She supports children to express their ideas about how plants absorb water by supporting children to record their observations, create a visual graph of their data, and interpret their data in a group discussion.
- Other ways children could learn about this concept might include reading about the concept, drawing a picture of the process, creating a stop-motion film that shows the process, or creating a dramatic representation of the process.