

Small Group Learning Experiences

STEM Across the Curriculum: Form and Function in the Garden

Small Group - Does it Hold Water?

Activity adapted from one developed by Roth & Massey (1997)

Description: We have a problem! Our plants need to be watered, but the watering can is missing. In this activity, children reason about the features that make an item good or not good for carrying water and watering plants. They use this information to solve our problem.

Learning Objective(s):

- Engage in flexible thinking about the jobs different tools can do.
- Explore and describe properties of human-made objects.
- Explore ways that the shape, material, and form of objects relate to the jobs that they can do.
- Attend to and use attributes of objects and materials to make predictions or solve problems.

Vocabulary:

- Water (*agua*)
- Watering can (*regadera*)
- Container (for water) (*recipiente*)
- Problem (*problema*)

Literature:

- *Garden Tools*, by Alison Auch
- *Tools for the Garden*, by Mari Schuh
- *Gardening Tools*, by Inez Snyder
- *The Ugly Vegetables* – Grace Lin (see Lesson Extensions below)

Materials:

- Collection of items that would be good for carrying water but not things that one would usually think of (in a variety of sizes and materials) – e.g., thimble, jar lid, empty can, etc.
- Collection of items that would not be good for carrying water, some of which are shaped like bowls (a variety of sizes and materials) – e.g., paper coffee filter, colander, wicker basket
- 2 trays or towels to catch water and to sort items
- water (from sink, preferably, or in a large bucket)
- plants (either those that are growing in the classroom or ones you bring in)

Procedure:

1. Challenge Problem: “We need to water the plants we are growing, but the watering can is missing. What other things could we use to move water from the sink to the plants?”
2. Allow children to explore the items and to work together to sort them into “will solve our problem (carry water)” and “will not solve our problem.”
3. Encourage children to describe their reasons for their predictions. What features of the item made them think it would be a good holder and carrier for water or not?
4. Test it! Pour water in (or dip into bucket).
5. Review each item again. Was it good for holding water?
6. Let children know that they will have the chance to use the good holders to carry and pour water later. They will try to figure out which item works the best for carrying and pouring.

Small Group Learning Experiences

STEM Across the Curriculum: Form and Function in the Garden

Lesson Extensions:

1. Some items will hold water, but they won't work well to carry or pour because of their size or form. During centers or a subsequent small group, encourage kids to compare two containers that hold water to find out which one works better for carrying water from the sink to the plants and for watering. (A small lid and a medium can would be a good pair.)
2. Children can also try pouring water with the good holders and carriers. Now, which item works the best? What features of the item make it work well for pouring?
3. The idea of matching the size/form of a tool to the size of the job to be done arises in the book *The Ugly Vegetables*. It will also come up in center activities and math measurement small groups.

Discussion Questions:

1. **What are some other ways you could reinforce the learning objectives of this activity by engaging children in activities that involve containers?**

2. **Science is the study of the natural world while engineering involves the human-made world. Engineers design tools and processes to solve problems. These tools and processes are called technologies. In what ways does this activity and its extensions support children's thinking about the T and E in STEM (technology and engineering)?**