Stacking Cups Activity

Summary:

In this lesson, students are given an index card with a visual or tactual representation of a stack of cups. Students work to build a real representation of the model using plastic cups and double sided tape. Then, they must write out the steps they took and provide them to a friend, teacher, or family member to see if they can recreate the model without the visual or tactual guide. This activity reinforces skills such as sequencing, logic, computational thinking, and problem solving.
ECC areas addressed in this lesson include orientation & mobility, compensatory access, and sensory efficiency.

Audience: Grades 3-12	**Plugged or unplugged:** Unplugged

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Adapted from materials originally published by Perkins School for the Blind

California State Standards for Language Arts:

- RL.3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RL.3.2: Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.
- RL.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- RL.4.2: Determine a theme of a story, drama, or poem from details in the text; summarize the text.
- RL.5.1: Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- RL.5.2: Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
- RL.6.1: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- RL.6.2: Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- RL.7.1: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- RL.7.2: Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.
- RL.8.1: Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
- RL.8.2: Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.

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Materials needed:	Prerequisite skills:	Time Estimate:
● Several index cards ● Foam stickers ● Black marker and whiteboard or large sheet of paper (for low vision student) ● Plastic cups ● Double sided tape ● Foam to cut out arrows ● Construction paper or braille paper to create tactile stack cup guide ● Braille letter stickers (for braille reader)	● Tactual discrimination ● Familiarity with symbolic representations of information ● Ability to follow instructions ● ability to break a task into smaller steps ●	● 1 hour

Objectives:

1. Students will be able to represent pieces of information using symbols (foam arrows)
2. Students will be able to determine a sequence of steps to create a pattern, and communicate those steps to another person so they are able to accurately recreate it.
3. Students will use problem solving skills to find errors in their instructions, and redesign as needed.

Instructional Sequence:

Step 1: The Set Up	Cup Stack Pattern Card: using an index card, create a tactile or visual representation of a pyramid of 3 cups, 1 cup balancing atop 2 bottom cups. You can draw this on an index card with a thick black marker, or you can use foam stickers to make a tactile representation. Ensure that all 3 stickers are the same size and shape. *See images below* Tactile Stacking Guide: Next, design a tactile stacking guide. This can be done with either

	braille paper and braille markings, or blank paper and drawn bold lines. There will be 8 vertical lines evenly spread across the paper. The width between each line will be approximately the distance of half a cup. *See images below* Symbol Key: Cut out arrows from foam. Label one as up, 1 as down, and 1 as right. Place these arrows vertically on an index card. You can also write/draw the symbol card for a low vision student. To the right of each symbol explain its meaning as follows. Up arrow = pick up cup from stack Right arrow = move cup ½ cup length to the right Down arrow = place cup down
Step 2: Introducing Concepts	Begin lesson by discussing experiences in which students have been provided a model of something to copy. This could include using a stencil to draw, painting by numbers, molding clay after a physical model, copying a dance routine, etc. Talk about the process they used to copy the original model. Did they run into any issues? How did they account for those issues? After having that experience, ask if they believe they have enough knowledge to explain to someone else how they completed the process.
Step 3: Introducing Cup Stack Pattern Card	Provide your student the cup stack pattern card. It is either drawn out, or uses foam stickers to represent the desired pattern. Explain how the card represents a stack of cups. Discuss the shape on the card. What could it mean?
Step 4: Introduce Activity Materials	Present the stack of cups, symbol key, and stacking guide. Explain each individual component. The cups will recreate the pattern. The stacking guide will be where the cups are stacked. The arrows will be the language through which the instructions will be communicated to someone else.
Step 5: Building the Stack	Ask student to create the pattern using the cups. At this point, the student is not using

	the arrows to write out the instruction. Students are simply creating the pyramid on the stack guide.
Step 6: Writing Instructions	Once pyramid is built, students use symbol key, writing tool of their choice, and additional foam arrows to write out the instructions for someone else to use to recreate the pyramid. *Make sure to review the meaning of each symbol *Students can use the foam arrows, double sided tape, and construction paper to create their instructions, or they can draw out the arrows using markers and paper *There will be 3 lines of instructions, one for each cup
Step 7: Swap Instructions	Once instructions have been created, student can give them to a classmate or instructor along with the symbol key, stacking guide, and supplies so that they can build the pyramid. Do not give the classmate the original cup stack pattern card.
Step 8: Test & Redesign	If the classmate runs into any errors with following the instructions, have your student revisit their directions. *Have them identify any errors. *Have them rewrite instructions with corrections.
Pro Tip:	This lesson can be repeated using any pattern you can think of, and depending on your student's cognitive and developmental level.

Visual Representation of cup stack pattern card:

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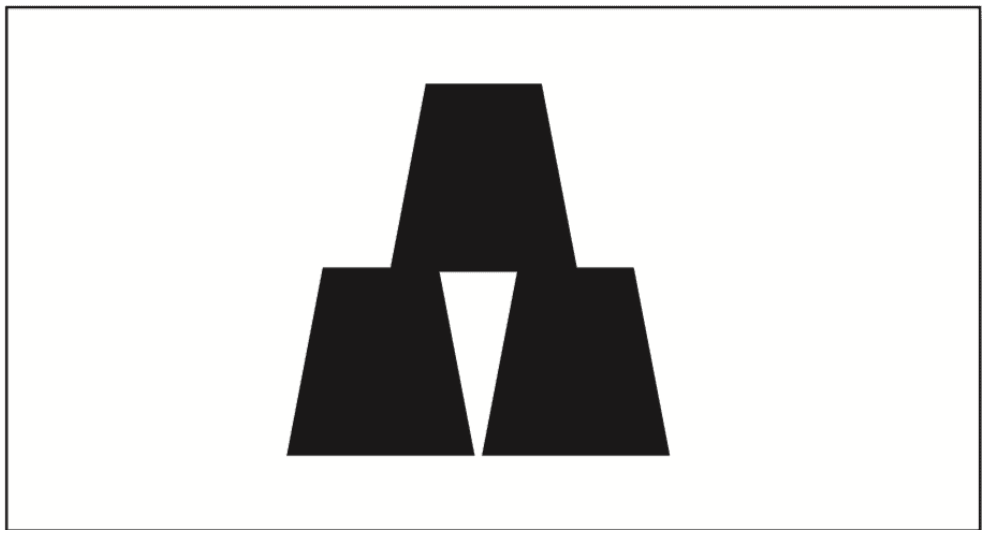
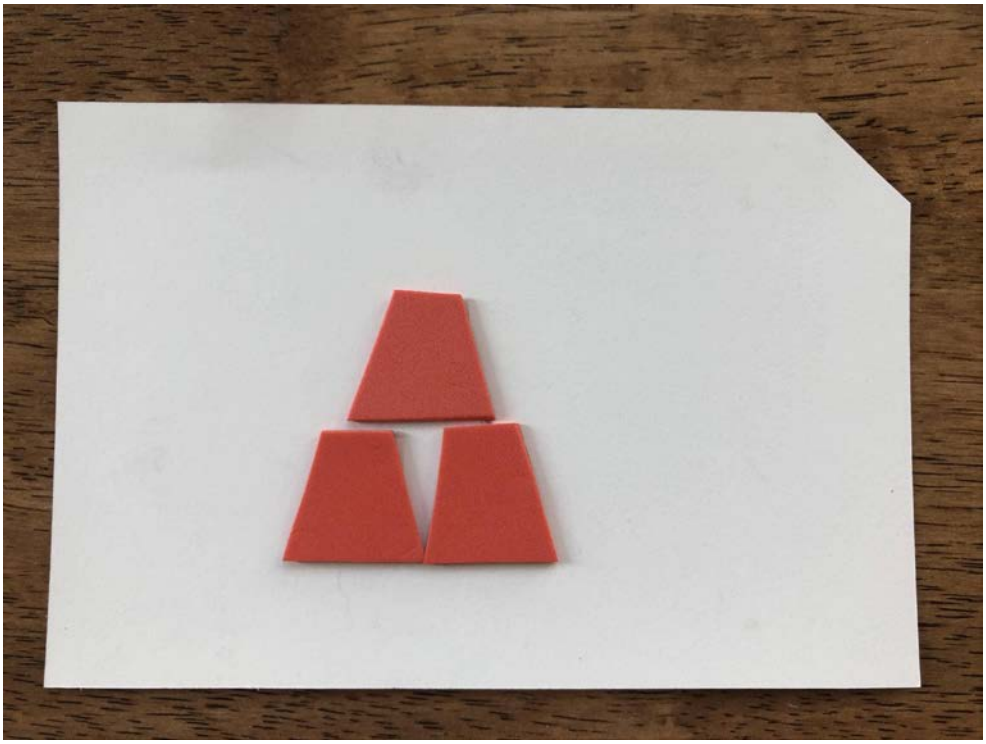


Tactile representation of cup stack pattern card:



Tactile cup stacking guide:

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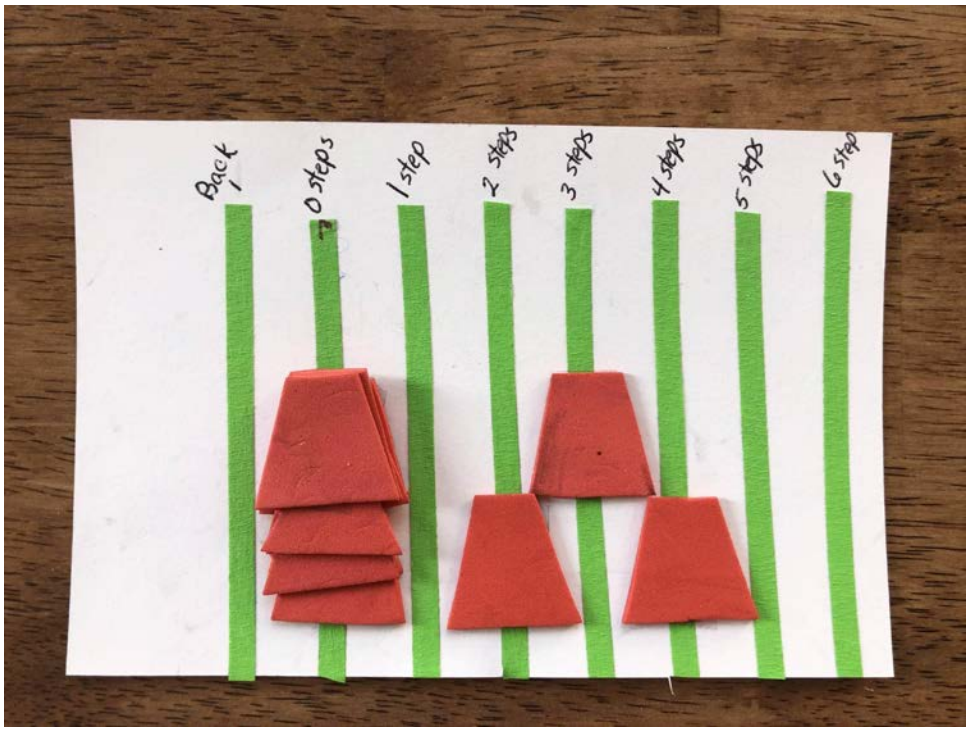
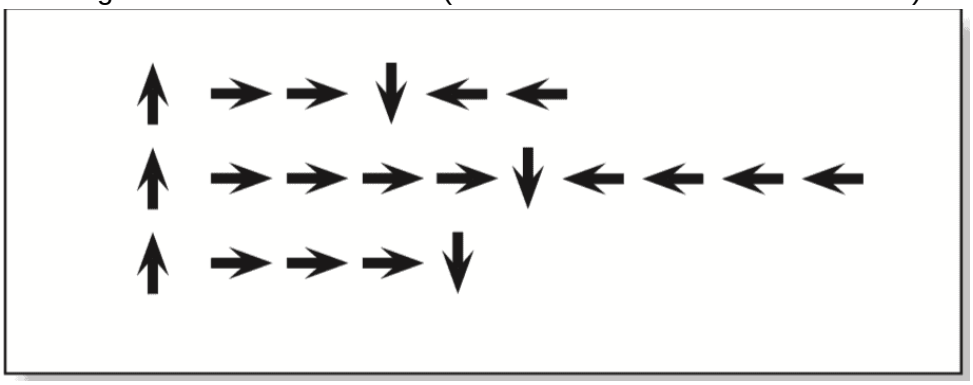


Image of visual code solution: (note this lesson omits the left arrow)



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