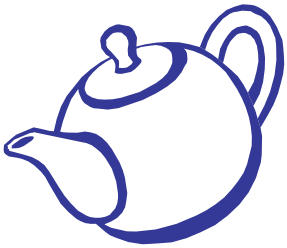
May I Pour For You?

At the house of the March Hare, Alice invites herself to tea with the Mad Hatter, the Dormouse, and the March Hare. In this activity, children will have their own tea party with small bottles of various shapes and sizes. As they explore with water (tea), they'll gain valuable lessons in predicting and comparing the volumes of the different bottles.



Did You Know?

- ♣ Tea was used as far back as 2,337 BC. In China, monkeys were trained to pick tea leaves from hard-to-reach places. Today, there are at least 3,000 varieties of tea available.
- ♦ *Volume* is the amount of matter – solid, liquid, or gas – a container will hold inside.
- ♠ The amount of water that a straw can hold is the same amount of water that a teaspoon can hold.

To Get Ready:

Set up the trays for each pair of students ahead of time. Include 5 different containers, a measuring cup, and a turkey baster on each tray. Jugs of water (colored if you like) can be placed around the room for refills.

What you'll need:

(for each pair of students)

- ♣ 5 assorted bottles or containers (It helps to have at least two with similar volumes.)
- ♦ Measuring cups
- ♠ A tray
- ♥ A turkey baster

(for the class)

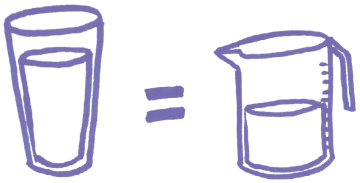
- ♣ Jugs of colored water
- ♦ Colored pencils or crayons
- ♠ Paper, to record predictions and observations

To Start, Ask:

Which bottles do you think might hold the same amount of liquid (have the same volume)?

Try It!:

- ♣ Take a careful look at the assortment of bottles. Which bottles might hold the most? Which bottles might hold the least? Make some predictions.
- ♦ On a piece of paper, draw some pictures that show your predictions.
- ♠ To test your theory about which bottles might hold the same amount of liquid, fill one bottle to the very top with water. Using a turkey baster, or pouring very carefully, transfer the water from the first bottle to the other bottle that you predicted has the same volume. Was your prediction accurate? Record your findings.
- ♥ Now, choose two bottles of different shapes. Which bottle do you think will hold more? Do you think it will hold two times as much? Draw an equation to represent your prediction. Test your theory by filling one bottle to the top with water, then transferring the water to the other bottle. Which bottle held more? How much more liquid did it hold? Draw a new equation to show what you found out.
- ♣ Try experimenting with other bottles. Will two different bottles filled with water fit into a third bottle? Will one bottle hold three times as much liquid as another, or will it only hold half as much?



Questions to think about and ask:

- Were you surprised by any of your findings?
- Which bottle shape seemed to hold the most liquid?
- Did any of the bottles have exactly the same volume?
- Can you put your bottles in order from least volume to greatest volume?

Assess What Happened (Students reflect):

Invite students to do an experiment at home by comparing the volume of three containers they find in their cupboards. Ask them to make predictions and write equations based on what they've learned.

Connect it to Standards:

"As a result of their activities in grades K-4, all students should develop an understanding of the properties of earth materials [which includes] water." (National Research Council Science Education Standards)

Connect it to the Story!

In her travels in Wonderland, Alice comes upon an unusual tea party attended by the Mad Hatter, a March Hare, and a Dormouse. She sees a very large table that is scattered with cups, saucers, plates, and pots of tea. The conversations at the Mad Tea Party are very odd indeed and make no sense at all, but the strangeness doesn't end there. When the plates and cups are dirty and the riddles remain unsolved, everyone moves to the next seat and the party begins all over again. At this tea party, the March Hare's clock has stopped at 6 o'clock … which means it's always teatime! You too can have your own crazy tea party by pouring "tea" into all sorts of bottles and finding two with the same volume.

Career Corner:

Chemists are scientists who experiment with different liquids to find out how they mix together. If you enjoyed experimenting with volume, imagine what you might do if you were a chemist!