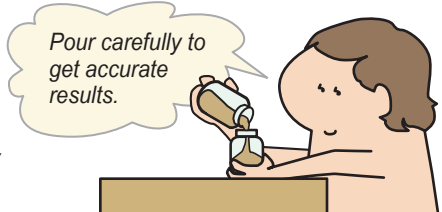


sneaky algebra

...adapted by TOPS Learning Systems from our **GET A GRIP WORKSTATION #73**

- 1.** Solve these puzzles by experimenting with lentils:
Fill a container *fair and full*, and start pouring!



PUZZLE 1	<p>Which holds more?</p> <p>C 2A</p>	PUZZLE 2	<p>Which holds more?</p> <p>C-A B</p>
PUZZLE 3	<p>Order by volume: (small < medium < large)</p> <p>2A C-B B</p>	PUZZLE 4	<p>Order by volume: (small < medium < large)</p> <p>2B 3A B+C</p>

- 2.** Write your solutions as English sentences. For example:
A plus B holds more than C.
Or write as algebra.
See how easy: **A+B > C**



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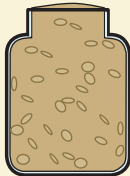
OBJECTIVE

To compare volumes. To express conclusions in terms of algebraic relationships.

MATERIALS/PREPARATION

- Copy the activity for students or lab teams. Or set up a workstation in a corner for individual use.
- Recycle small (2½ oz), medium (4 oz) and large (6 oz) Gerber brand baby food jars, marketed as 1st, 2nd and 3rd Foods. Boldly label these **A**, **B**, and **C** from small to large. Apply and cover labels with clear packaging tape. (Freely substitute pill vials, bottles, tins, or other containers with similar size relationships.)
- Set up a "job box" or tub with about 2 inches of lentils in the bottom. Ideally it should have a seamless bottom and the capacity of a small washbasin, perhaps 2 square feet and 4 inches high to accommodate enthusiastic scooping and minimize spills.
- Introduce the concept "fair and full" for consistent results. Fill a jar loosely to overflowing (don't pat or jog down), and give a gentle sideways shake to remove excess lentils. The surface will be slightly mounded when filled fair and full.

FAIR AND FULL



SOLUTIONS/ANSWERS

These results are based on Gerber brand baby food jars. Different capacity containers, of course, may generate alternate mathematical conclusions.

1. $C > 2A$ (or) C holds more than 2A:
A, filled fair-and-full twice, underfills C (or) C fills A twice, with lentils left over.
2. $B > C-A$ (or) B holds more than C-A.
Fill C and pour out A.
What remains doesn't fill B.
3. $C-B < B < 2A$:
C-B underfills B, and B underfills 2A.
4. $3A < 2B < B+C$:
2B overfills 3A and 2B underfills B+C.

EVALUATION/EXTENSION

- a. Can you find equal volumes? Here are two solutions using recommended baby food jars:
 $4A = B + C$ (and) $4A + 2B = 3C$
- b. Make up new puzzles of your own for friends to solve. Add more labeled containers for more challenging possibilities.

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