

RAFT IDEAS

Topics: Area, Volume, 3-D Shapes, Measurement, Geometry, Number Sense, Invention

Materials List

- Art Posters
- Square tiles, length of side equal to or less than $\frac{1}{3}$ the shortest side of the poster
- Ruler (metric)
- Pencil or pen
- Scissors
- Tape
- RAFTy Nesting Box Template, page 2

This Activity can be used to teach:

- Volume and problems involving volume (Common Core Math Standards: Grade 5, Measurement & Data, 3 & 5; Grade 6, Geometry 2; Grade 7, Geometry 6)
- 3-D figures made from 2-D nets (Common Core Math Standards: Geometry, Grade 6, 4)



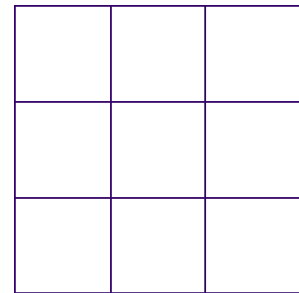
RAFTy Nesting Boxes



Practice multiplication while creating boxes from art posters and other recyclable creative papers!

Assembly of Box

1. Using a ruler, measure the length of one side of the square tile.
2. Multiply the length by 3.
3. Cut the art poster to be square, making the lengths of each side equal to three times the side of the tile
4. Fold the poster into thirds on each side.
5. The rectangle in the center created by the folds will become the box bottom.
6. Make tabs on opposite sides of the poster by cutting 2 slits, one square length deep on each side. (see template on page 2)
7. Fold the sides up and the tabs in, creating a box shape.
8. Secure tabs with tape.



Assembly of Nesting Boxes

Repeat the steps to make the box for each tile that you have. All the boxes will nest inside of one another. If you place the boxes upside down inside the next box, it will make a lid.

The Math Behind the Activity

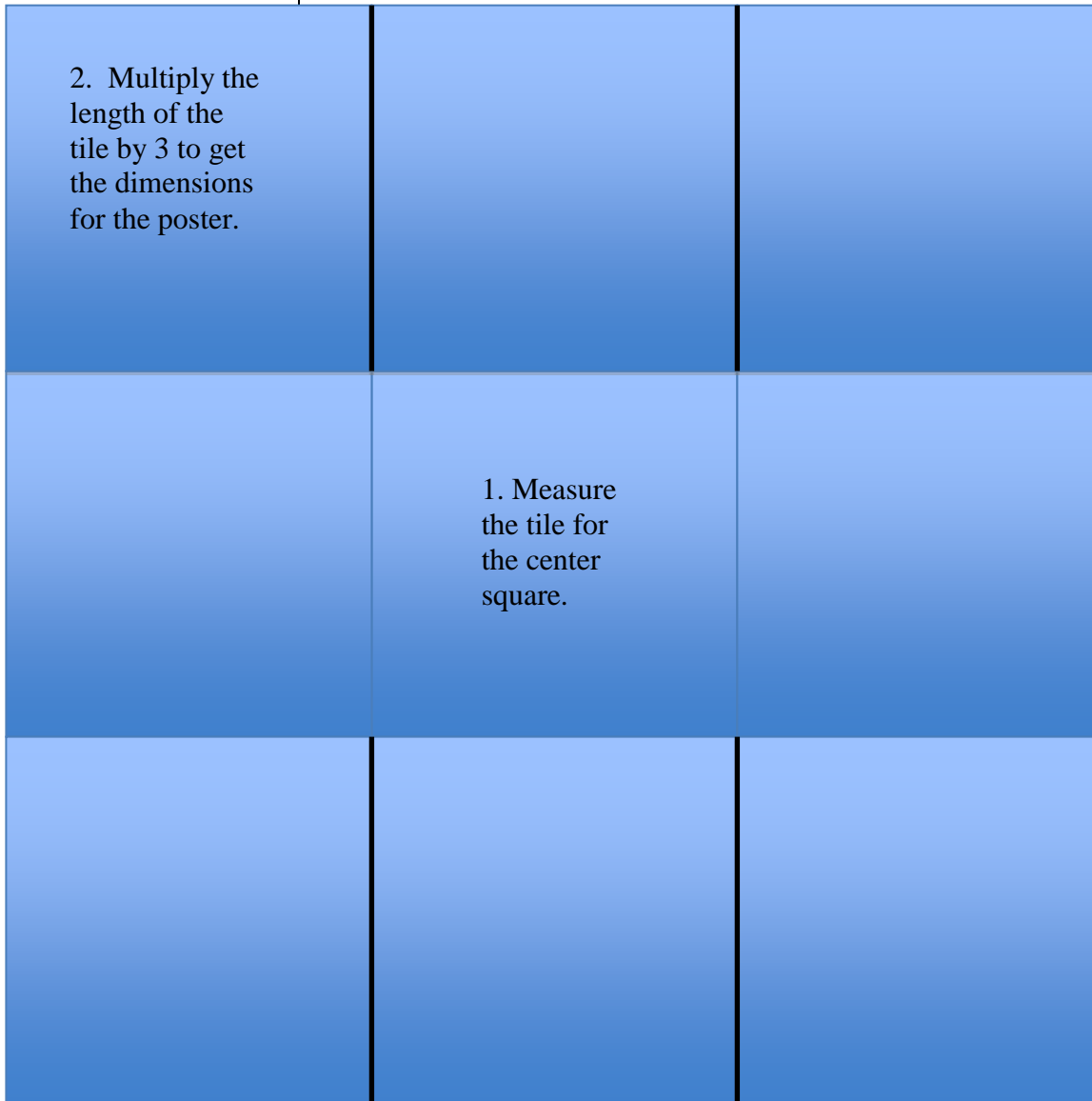
The process of building a box from a flat rectangle (2-D) to a cube (3-D) builds spatial thinking skills. This activity also provides an opportunity to measure in metric both area ($L \times W$; 2-D surface space) and volume ($L \times W \times H$; 3-D amount of space that the box can hold). By starting with a square tile as the template for size, the students will create a geometric net of the box before they fold it up. This (2-D) to (3-D) spatial reasoning is hard for many kids to imagine. By building up the box from the flat piece of paper they will be able to visualize how other boxes in the real-world come apart flat.

Taking it Further

- Have students look for boxes in their environment. Boxes can be deconstructed and reconstructed based on knowledge of the (2-D) net that is formed when the box is laid flat.
- See RAFT idea sheet *Folder Boxes*.

Web Resources (Visit www.raft.net/raft-idea?isid=709 for more resources!)

RAFTy Nesting Box Template – Multiplication Pattern



3. Cut out the large square based on the multiplication of the length of the side of the tile.
4. Fold the square to get the 3 by 3 grid you see above.
5. Cut along the darkened lines from the template above that coordinate with the poster.