

RAFT IDEAS

Topics: Area, Volume,
3-D Shapes,
Measurement, Geometry

Materials List

- Folders or Greeting Cards
- Ruler (metric)
- Pencil or pen
- Scissors
- Tape (optional)

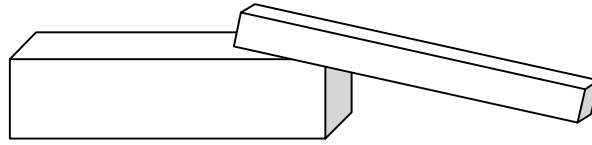
This Activity can be used to teach:

CO Math Standard 4:
Shape, Dimension, and
Geometric Relationships

- Area
 - Volume
 - Constructing 3-D shapes from 2-D
- 21st Century Skills:
- Critical Thinking and Reasoning
 - Collaboration
 - Invention
- Grades: PK, K, 1, 2, 3, 4, 5, 6, 7, HS



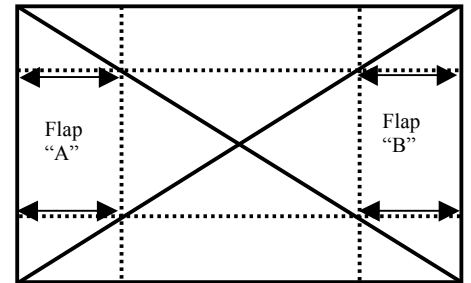
Folder Boxes



Don't throw away those used folders or greeting cards! They can be used to teach math. And the end result is a really great box that students absolutely love!

Assembly of Box Top

1. Using a ruler or straight edge, draw 2 diagonal lines onto the back of the cardstock, from corner to corner.
2. Fold in each of the 4 edges to the center (marked by the "X").
3. Make 4 cuts (as depicted by the arrows) along the folds to the diagonal lines.
4. The rectangle in the center created by the folds will become the box bottom.
5. Fold the sides up and the tabs in, creating a box shape.
6. Fold the flaps up and over the tabs, securing with tape if desired.



Assembly of Box Bottom

Follow the steps to make the box top, except when folding each of the 4 edges to the center (step 2), fold *slightly* beyond the "X" in each case.

The Math Behind the Activity

The process of building a box from a flat rectangle (2-D) to a rectangular solid (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). If students begin with rectangles of the same area but different dimensions (see the full activity details from the link below), they will find that their volumes are different. Careful data collection and analysis will reveal that the closer the original rectangle is to a square, the more volume the box will have.

Taking it Further

This activity idea is from the Exploratorium book *The Math Explorer* ("Greeting Card Boxes"). For full instructions, detailed graphics, and elaboration of how to use this activity for math education, go to:

http://www.exploratorium.edu/math_explorer/greeting_card.pdf

The Math Explorer is full of great, Hands-on math activities targeted for after school programs and can be purchased from the link above.

Web Resources - Visit www.raft.net/more for how-to videos and more ideas!