raft resource area for teaching
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Curriculum topics:

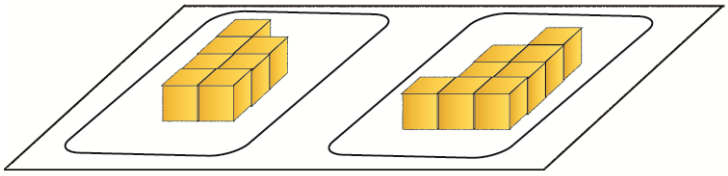
- Area
- Estimation
- Measurement
- Geometry

Subject: Math

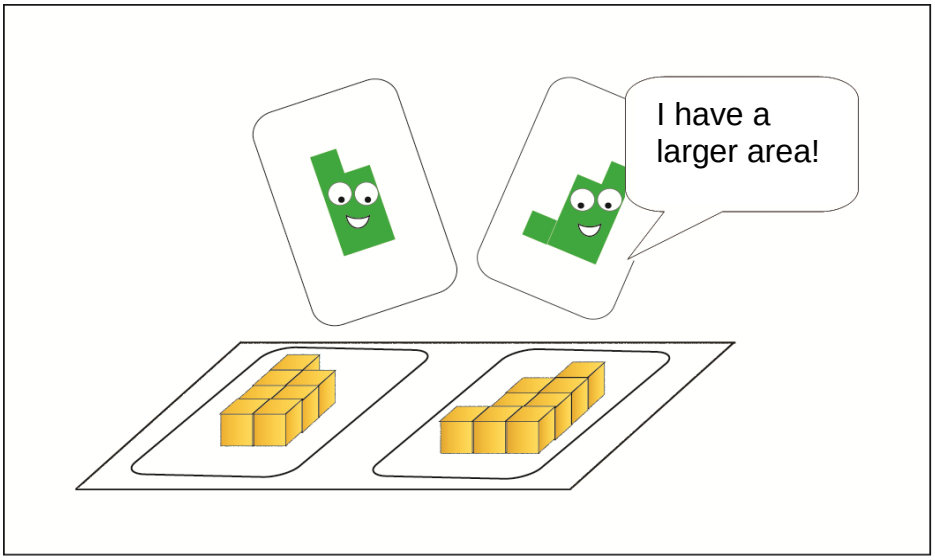
Grade range: 3 – 8

AREA ANTICS

Estimate and measure area…and more



This popular activity plays like the card game "War," but with a new twist. Players estimate, and then measure, the area of shapes by covering them with centimeter blocks. With practice, they internalize the concept of area and learn to estimate it. This activity can also be used to learn about perimeter. Adding more layers of blocks introduces the concept of volume.



Who we are:

Resource Area for Teaching (RAFT) helps educators transform the learning experience through affordable "hands-on" activities that engage students and inspire the joy and discovery of learning.

For more ideas and to see RAFT Locations

www.raft.net/visit-raft-locations

Materials required

(if using the RAFT Kit)

- 40 preprinted playing cards
- 100 cubes (1x1x1 cm)

(if creating your own set)

- 40 blank cards
- Two sheets of 2” x 4” labels
  or 1 full-page colored label
- Grid and Shape Templates (pages 4-7)
- 100 cubes (1x1x1 cm)
- Scissors

How to build it

If using the RAFT Kit, go to “Playing the game” below.

1 To make cards, use one of the following methods:

2x4” Labels: Copy shapes from pages 6-7 onto the front of each of two sheets of 2” x 4” labels. Next, cut each label in two pieces so that each shape is on a separate piece. Place each shape on a blank card.

Full Page Colored Label: Copy shapes from page 5 onto the **back** of the label. Cut shapes from the full-page label using the grid on the back as a guide. Peel off the backing and place each shape on a blank card.

Blank Grid: Draw your own shapes, or make replacement shapes using the grid on page 4.

Playing the game (for 2 - 4 players)

1 Shuffle and deal all the cards face down. The players do not look at their cards but keep them face down in a pile in front of them.

2 Each player turns over their top card and places it face-up on the table. Players compare the areas of the shapes on the cards (without actually measuring them) and estimate which player has the card showing the greatest area. If all players agree, the winner collects the upturned cards and keeps them in a separate stack. Each player then turns over a new top card.

3 If the players cannot agree on which card has the greatest area, they take the cubes and measure the area on their cards. When the winner of the round is determined, the winner collects all the cards. The game continues this way.

4 In the case of a tie, the involved players each turn over a new card to decide the “winner”. The winner of that play takes all the cards from both rounds of play.

5 The final winner is the player with the most cards at the end of the game.

Curriculum Standards:

Understand and Measure Area (Common Core Math Standards: Grade 3, Measurement & Data, 5, 6, 7.a, & 7.d)

Compute Area and Perimeters (Common Core Math Standards: Grade 4, Measurement & Data, 3)

Solve problems involving area, volume, and surface area of 2 & 3 dimensional objects (Common Core Math Standards: Grade 7, Geometry, 6)

Additional standards at: http://www.raft.net/raft-idea?isid=282

The math behind the activity

Area is the amount of 2-dimensional space that a shape occupies and is measured in units squared (e.g., cm^2). Areas of regular shapes can be determined by formulas such as: *length x width = area* for rectangles and *½ base x height = area* for triangles. Determining the area for irregular shapes is more complex. Area Antics helps children visualize the area of different shapes by touching and moving objects (**manipulatives**) as they make measurements.

Learn more

- This activity can be extended to present the concept of perimeter. The same rules apply, but the winner of each round is the player whose card shows the shape with the largest perimeter. As an introductory exercise, ask players how many cube faces an ant would need to walk past to complete one trip around their shape.
- The activity can also help teach the concept of volume. Each player tosses a 6-sided die, and uses the result to set the height of their 3-D shape (1-6 layers of cubes). The player with the greatest volume is the winner of the round. Also see RAFT Idea Sheet ***Taking Up Space***.

  Tip: be sure students are completely familiar with area before introducing perimeter or volume. Teaching these concepts at the same time can be confusing.

Related activities: See RAFT Idea Sheets on Volume:

Building it Bigger-
http://www.raft.net/ideas/Building it Bigger.pdf

The Long and the Short of It -
http://www.raft.net/ideas/Long and Short of It.pdf

Taking Up Space-
http://www.raft.net/ideas/Taking Up Space.pdf

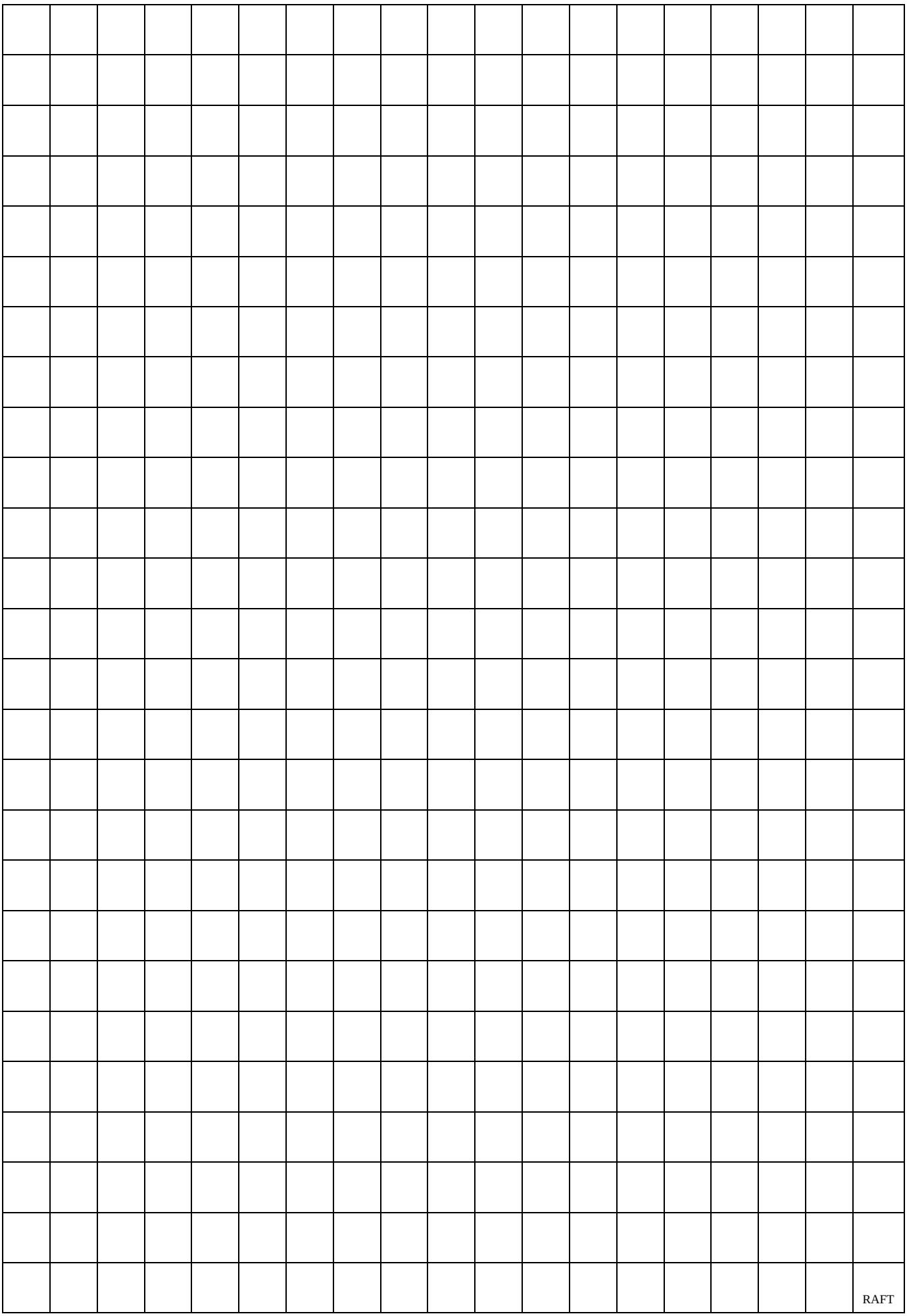
Resources

Visit www.raft.net/raft-idea?isid=282 for "how-to" video demos & more ideas!

See these websites for more information on the following topics:

- **Ask Dr. Math description of area, perimeter, and volume of various geometric shapes** – http://mathforum.org/dr.math/faq/formulas/
- **NCTM lesson for linking area, perimeter, and area** – http://illuminations.nctm.org/LessonDetail.aspx?ID=L260
- **Videos and exercises on area from the Khan Academy** – https://www.khanacademy.org/math/geometry/basic-geometry/perimeter_area_basics/v/area-and-perimeter
- **Teacher designed math courses from the New Jersey Center for Teaching & Learning** – https://njctl.org/courses/math

One Centimeter Grid



One Centimeter Grid – Sample Shapes