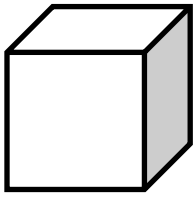
Squares

Project



SQUAREA

(Area and Volume)

_____

_____

_____

Note: All answers should include appropriate units such as square inches ($in.^2$) or cubic feet ($ft.^3$).

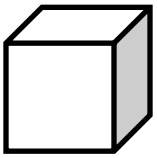
I. SQUARE FOOT

1. Cut out a square foot.
2. Draw square inches on your square foot.
3. How many square inches are in a square foot? _____

II. AREA TRACING/DRAWING

1. Trace or draw at least five objects on your square foot and color them.
2. Label each object and write its estimated area **on** your square foot.

Object	Area	Object	Area
A) _____	_____	D) _____	_____
B) _____	_____	E) _____	_____
C) _____	_____		

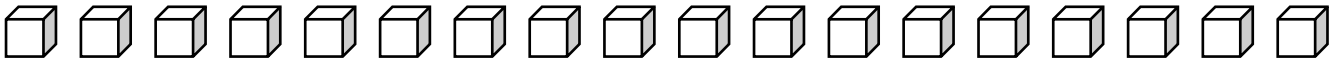


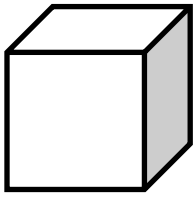
III. WHITE BOARD/CHALK BOARD

1. Use your square foot to estimate the area of one white board in square feet.
   L = _____ W = _____ A = _____
2. Estimate the area of the white board in square inches.
   Equation: _____ A = _____

IV. CLASSROOM FLOOR

1. Use your square foot to estimate the area of the classroom floor in square feet.
   L = _____ W = _____ A = _____
2. Estimate the area of the classroom floor in square yards.
   Equation: _____ A = _____
3. What would be the cost of carpeting the classroom at $25 per square yard?
   Equation: _____ C = _____





SQUAREA

(Area and Volume)

Answer Key

Note: All answers should include appropriate units such as square inches (in.^{2}) or cubic feet (ft.^{3}).

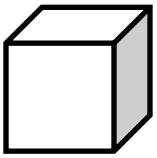
I. SQUARE FOOT

1. Cut out a square foot.
2. Draw square inches on your square foot.
3. How many square inches are in a square foot? _____***144 in.^{2}***_____

II. AREA TRACING/DRAWING

1. Trace or draw at least five objects on your square foot and color them.
2. Label each object and write its estimated area **on** your square foot.

Object	Area	Object	Area
A) __***Answers will vary***__	_____	D) _____***book***_____	__ ***20 in.^{2}*** _
B) _____	_____	E) _____	_____
C) _____	_____		

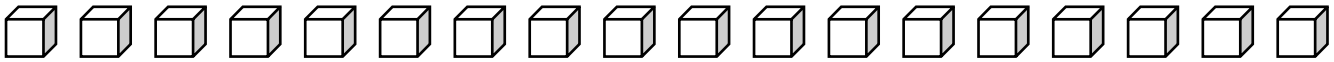


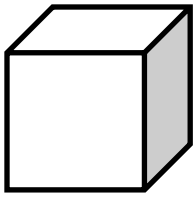
III. WHITE BOARD/CHALK BOARD ***(Answers will vary with board size.)***

1. Use your square foot to estimate the area of one white board in square feet.
   L = ____***12 ft.***____ W = ____***3.5 ft.***____ A = ___***42 ft.^{2}***___
2. Estimate the area of the white board in square inches.
   Equation:____***42 ft.^{2} x 144 in.^{2} = A***____ A = __***6,048 in.^{2}***__

IV. CLASSROOM FLOOR ***(Answers will vary with room size.)***

1. Use your square foot to estimate the area of the classroom floor in square feet.
   L = ____***30 ft.***____ W = ____***29 ft.***____ A = ___***870 ft.^{2}***__
2. Estimate the area of the classroom floor in square yards.
   Equation: _____***870 ft.^{2} ÷ 9 = A***_____ A = __***96.7 yd.^{2}***__
3. What would be the cost of carpeting the classroom at $25 per square yard?
   Equation: ____***96.7yd.^{2} x $25 = C***_____ C = __***$2417.50***__





SQUAREA

(Area and Volume)

_____

_____

_____

V. SQUAREA CONVERSIONS

1. How many square feet are in a square yard? _____
2. How many square inches are in a square yard? _____
3. How many square feet are in a square mile? _____
4. How many square yards are in a square mile? _____

VI. VOLUME

1. Take your square foot and tape it together with 5 other people to create a cubic foot.
2. Use your cubic foot to estimate the volume of the classroom in cubic feet.

   L = _____ W = _____ H = _____ V = _____

3. Use the cubic feet of the students in the classroom to construct a cubic yard.
4. How many cubic feet are in a cubic yard? _____

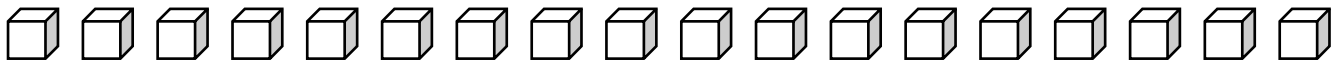
VII. SURFACE AREA

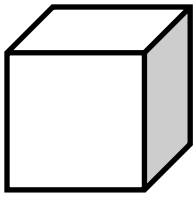
1. What is surface area? _____
2. Find the surface area of your cubic foot in square feet and square inches.

   Area in square feet: _____ Area in square inches: _____

3. Find the surface area of the cubic yard in square feet and square inches.

   Area in square feet: _____ Area in square inches: _____





SQUAREA

(Area and Volume)

Answer Key

V. SQUAREA CONVERSIONS

1. How many square feet are in a square yard? _____***9 ft.^{2}***_____
2. How many square inches are in a square yard? _____***1,296 in.^{2}***_____
3. How many square feet are in a square mile? _____***27,878,400 ft.^{2}***_____
4. How many square yards are in a square mile? _____***3,097,600 yd.^{2}***_____

VI. VOLUME

1. Take your square foot and tape it together with 5 other people to create a cubic foot.
2. Use your cubic foot to estimate the volume of the classroom in cubic feet. ***Answers will vary.***

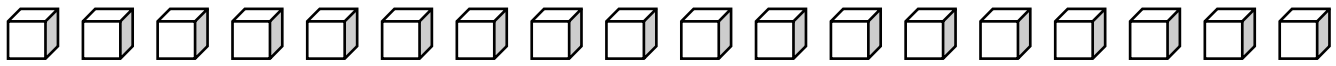
   L = ___***30 ft.***___ W = ___***29 ft.***___ H = ___***9 ft.***___ V = _***7,830 ft.^{3}***_
3. Use your cubic foot, along with others in the classroom, to construct a cubic yard.
4. How many cubic feet are in a cubic yard? _____***27 ft.^{3} (3 ft. x 3 ft. x 3 ft.)***_____

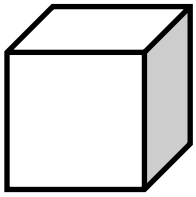
VII. SURFACE AREA

1. What is surface area? __***Surface area is the sum of the areas of the faces of a figure.*** __
2. Find the surface area of your cubic foot in square feet and square inches.

   Area in square feet: ___***6 ft.^{2}***___ Area in square inches: ___***864 in.^{2}***___
3. Find the surface area of the cubic yard in square feet and square inches.

   Area in square feet: __***54 ft.^{2}***___ Area in square inches: __***7,776 in.^{2}***___





SQUAREA TEACHER TIPS

(Area and Volume)

Lesson Description: SQUAREA (a hybrid word I created which stands for "Square Area") is a hands on math project that helps students to discover area, volume, and surface area in a very concrete, visual manner. Students measure objects in a classroom, create square feet, draw square inches, construct cubic feet, construct square yards and cubic yards, and investigate the surface area of a cube.

Math Content: Area, Volume, and Surface Area **Time Required:** about 2 class periods

The SQUAREA Project includes:

* 2 SQUAREA Project worksheets
* 2 SQUAREA Project worksheet answer keys
* 1 SQUAREA Teacher Tips page

Materials Needed: Construction paper, tape **Suggested Grade Level:** 5^{th} - 8^{th}

Teacher Tips:

* Construction paper should be used for this project. Students need to carefully measure the paper, draw guide lines, and cut off enough in order to create their square.
* When students draw their square inches on their square feet I usually have them do this lightly in pencil first, using a ruler. Many later outline their square inches with a black marker and ruler.
* Have the students draw and color the objects on their square feet **over** the square inch markings. This contrast makes it easier for the students to count the square inches.
* Teach students to estimate the area of objects that include partial squares. I encourage students to draw or trace objects that are irregular in shape.
* I find it easier to collect and grade page 1 and the square foot before completing page 2.
* It will take 162 square feet in order to create 27 stackable cubic feet that can be used to create your cubic yard. If you do not have this many students you can either cut out extra square feet (that have not been divided into square inches) or just model the answer for the class.
* Use a lot of clear tape to tape the six square feet together to create your cubic feet. Have students put their names on the front of their square feet since they will be taped together.
* Stack 27 cubic feet together to create a cubic yard. You can place them on tables in the center of the room for a nice Open House visual.

Testimonial:

Since I developed this project I have used it several times with 6^{th} and 7^{th} grade students. The way in which it allows them to actively learn the concepts of area, volume, and surface area is truly remarkable. The students are able to visualize the concepts of a square inch, a square foot, and a square yard. They work cooperatively with others to incorporate their personal square foot with others to create a cubic foot. Then they combine these with the cubic feet from other classes to construct a cubic yard. I often have this cubic yard on display at Open House for the parents to see.