



**RICE UNIVERSITY**  
**SCHOOL MATHEMATICS PROJECT**

# Investigating the Geometry around Us



**Susan Troutman**

**Rice University School Mathematics Project**  
**Director of Secondary Programs**  
**[troutman@rice.edu](mailto:troutman@rice.edu)**

**Carolyn White**

**Rice University School Mathematics Project**  
**Director of Elementary Programs**  
**[clwhite@rice.edu](mailto:clwhite@rice.edu)**



# GEOMETRY

## in Names

Write your name in capital letters across a large sheet of paper. Identify the geometry terms or shapes located in your name. Possible vocabulary words that can be used:

*Parallel lines*

*Square*

*Obtuse angle*

*Circle*

*Perpendicular lines*

*Rectangle*

*Acute angle*

*Line segment*

*Triangle*

*Trapezoid*

*Right angle*

*Edges*

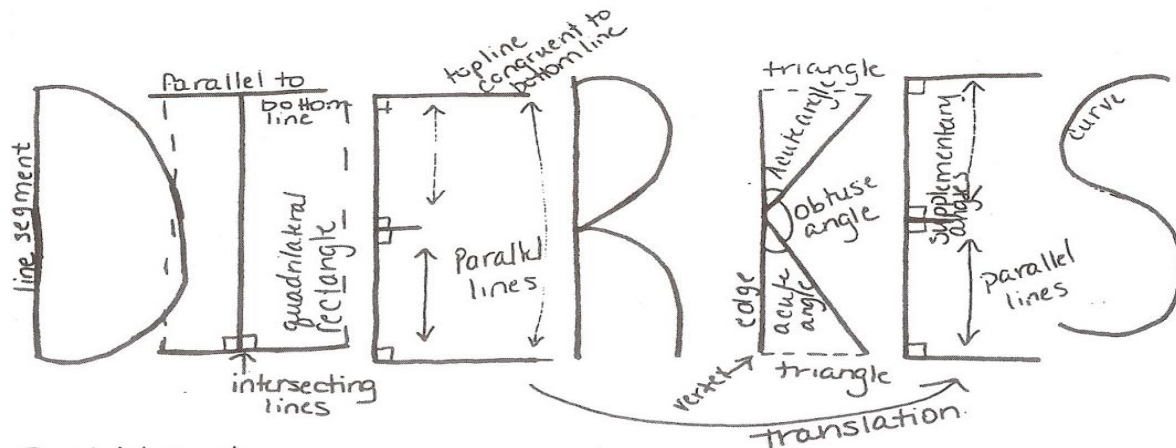
*Congruent*

*Translation*

*Supplementary angles*

*Vertices*

EXAMPLE:





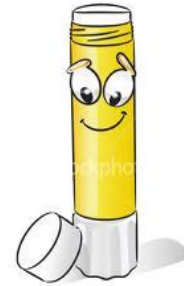
# Geometry Connections in Art and Literature





# You Will Need the Following Supplies:

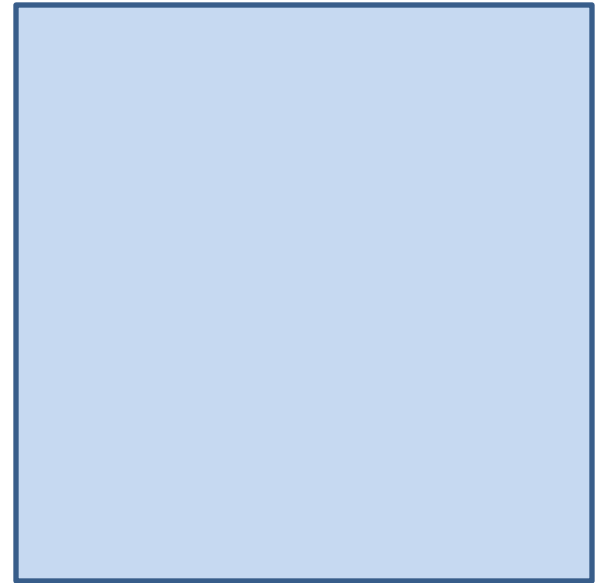
- A square piece of paper
- Scissors
- Paper
- Glue stick





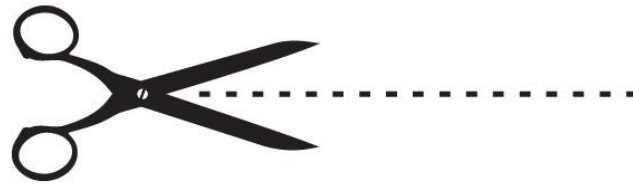
What are all of the possible names for this shape?

Where do you see this shape in the real world?



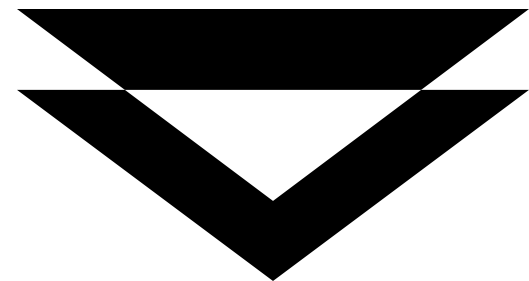


- Fold the sheet in half along a diagonal
- Make a sharp crease in the paper
- Unfold and cut along the crease



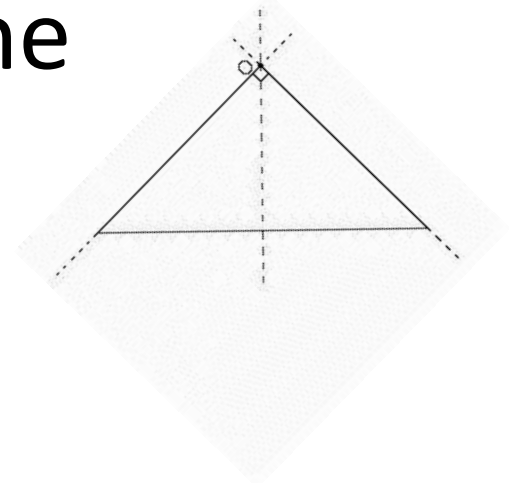


- Take one of the halves
- Fold it in half and cut along the crease
- How many pieces do you have?
- What fractional part is each piece of the original square?
- What can you tell me about the triangles?





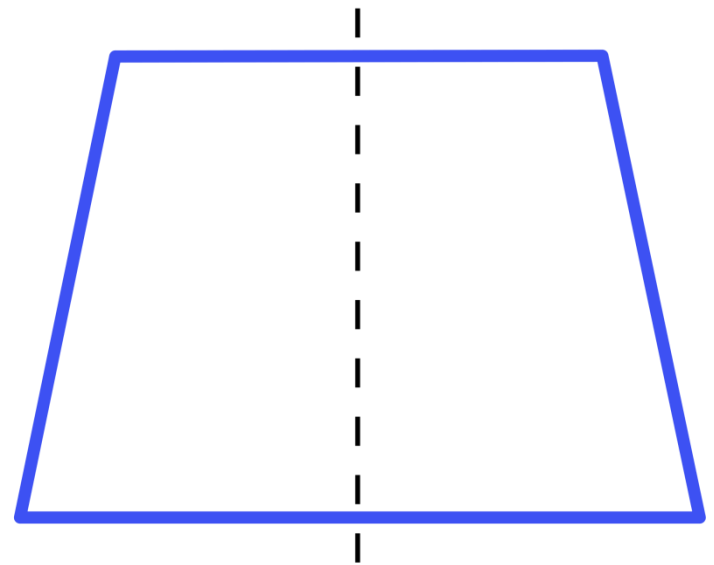
- Take the remaining half and fold it so that the vertex of the right angle touches the midpoint of the opposite side
- Cut along the crease
- What shapes do you now have?







- Take the trapezoid and fold it in half
- Cut along the crease to produce two congruent trapezoids





- Take one of the trapezoids
- Fold the “toe” to the “heel”
- Cut
- What shapes do you now have?



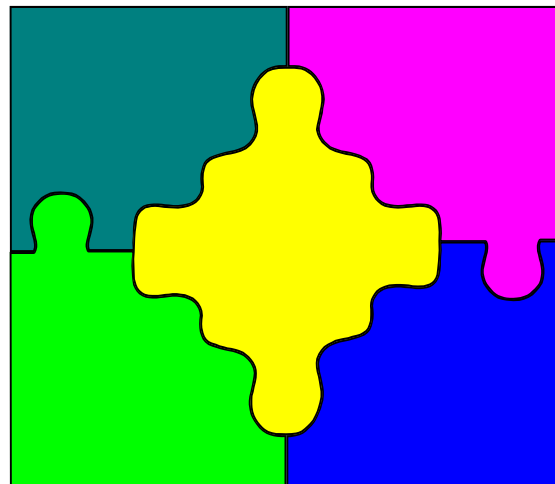


- Fold the other trapezoid from the “heel” to the top of the “shoe strings”
- Cut
- What shapes do you now have?





- How many shapes do you now have?
- Can you put them back together to form the original square?





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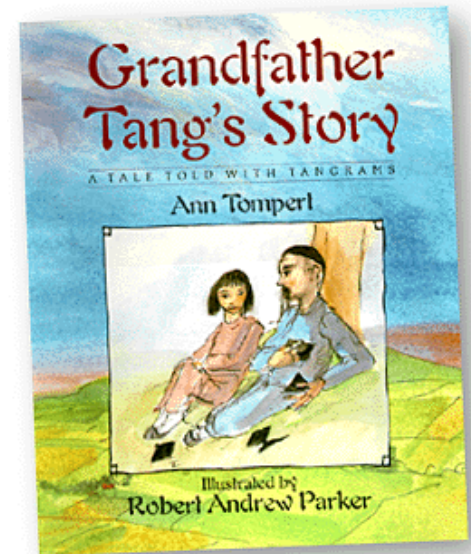


List some of the geometric terms we discussed while making our tangrams.





- *Grandfather Tang's Story*  
A tale told with tangrams  
by Ann Tompert
- Create your own design
- Write a poem or a story  
to describe your design



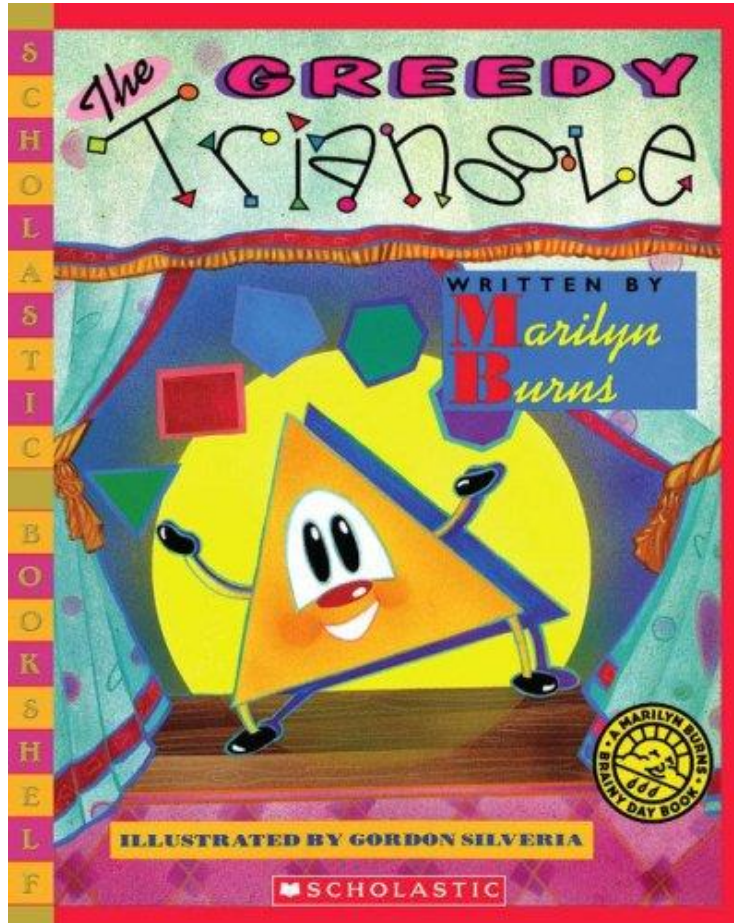








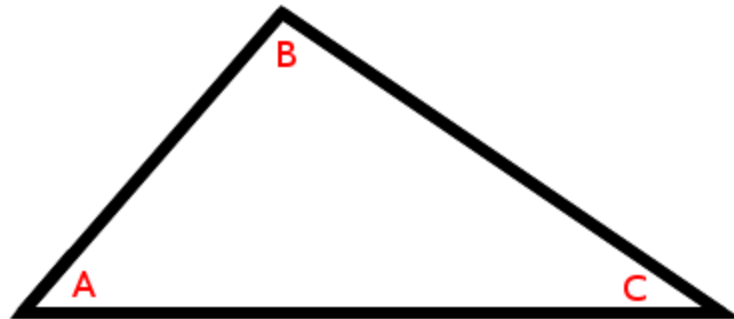
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## Exploring Polygons



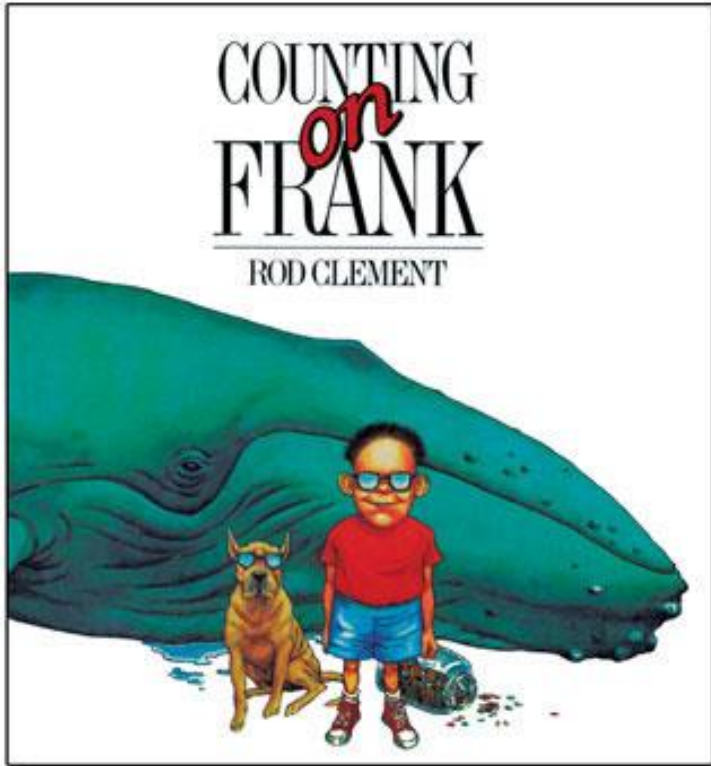
How can you find the sum of the interior angles of your polygons without using a protractor?





## Geometry Big Square

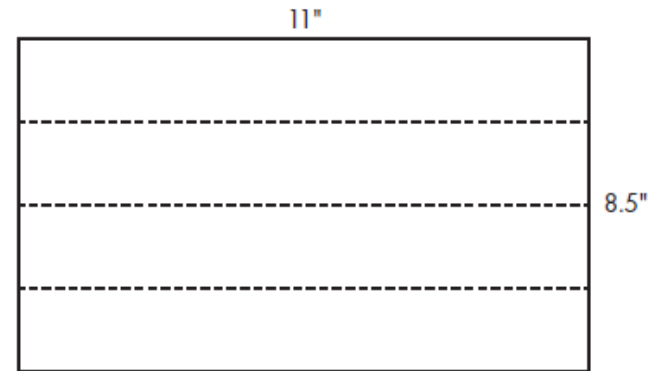
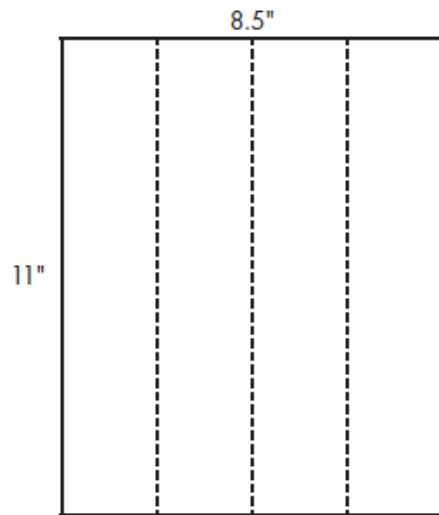
Arrange the smaller squares into a large  $4 \times 4$  square by matching the pictures of the geometric shapes with the most appropriate terms.



# Investigating Volume



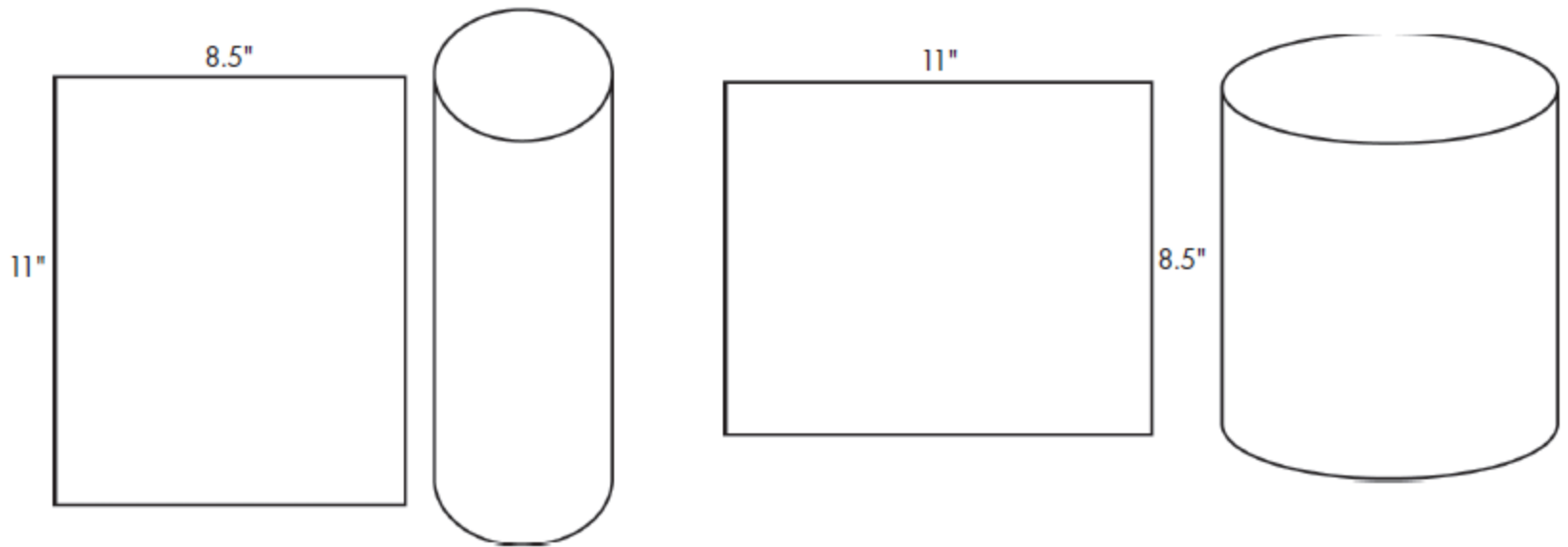
# Popcorn Prisms



Predict which prism will have a greater volume.



# Popcorn Cylinders



Predict which cylinder will have a greater volume.



# Geometry and Measurement Scavenger Hunt

<p><b>Geometric Terms/Figures</b></p> <p><i>Examples:</i></p> <p><i>Line segment</i> <i>Ray</i> <i>Acute angle</i> <i>Obtuse angle</i> <i>Right angle</i> <i>Parallel lines</i> <i>Perpendicular lines</i> <i>Transversal</i></p>	<p><b>Two-dimensional figures</b></p> <p><i>Examples:</i></p> <table><tbody><tr><td><i>Circle</i></td><td><i>Pentagon</i></td></tr><tr><td><i>Triangle</i></td><td><i>Hexagon</i></td></tr><tr><td><i>Quadrilateral</i></td><td><i>Heptagon</i></td></tr><tr><td><i>Square</i></td><td><i>Octagon</i></td></tr><tr><td><i>Rectangle</i></td><td><i>Nonagon</i></td></tr><tr><td><i>Parallelogram</i></td><td><i>Decagon</i></td></tr><tr><td><i>Trapezoid</i></td><td></td></tr></tbody></table>	<i>Circle</i>	<i>Pentagon</i>	<i>Triangle</i>	<i>Hexagon</i>	<i>Quadrilateral</i>	<i>Heptagon</i>	<i>Square</i>	<i>Octagon</i>	<i>Rectangle</i>	<i>Nonagon</i>	<i>Parallelogram</i>	<i>Decagon</i>	<i>Trapezoid</i>	
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<p><b>Three-dimensional figures</b></p> <p><i>Examples:</i></p> <p><i>Cube</i> <i>Rectangular prism</i> <i>Triangular prism</i> <i>Prisms</i> <i>Pyramids</i> <i>Cylinder</i> <i>Cone</i></p>	<p><b>Comparing Perimeter and Area</b></p> <p><i>Examples:</i></p> <p><i>Perimeter = Area</i></p> <p><i>Perimeter &gt; Area</i></p> <p><i>Perimeter &lt; Area</i></p>														





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## GEOMETRIC TERMS



parallel lines



Translation



Obtuse angle



acute angle

## 2-D shapes



Trapezoid



circle



Rectangle



decagon

## 3-D Shapes



Rectangular prism



cylinder



cube

## Comparing Perimeter and Area



$$P = 13.0 + 13.0 + 7.3 + 7.3 = 40.6 \text{ cm}$$

$$A = 13 \times 7.3 = 94.9 \text{ cm}^2$$

$P < A$   
 $40.6 < 94.9$



2.6cm

$$P = 2.0 + 2.0 + 2.6 + 2.6 = 9.2 \text{ cm}$$

$$A = \frac{2.6}{5.2} \text{ cm}^2$$

$P > A$   
 $9.2 > 5.2$





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**Rice University School Mathematics Project  
Houston, Texas**

**Website: [www.rusmp.rice.edu](http://www.rusmp.rice.edu)**



**Susan Troutman**

troutman@rice.edu

Director of Secondary Programs

**Carolyn L. White**

clwhite@rice.edu

Director of Elementary Programs

**Session # 273**