

Shapes and Designs

Glossary

Equilateral Triangle – A triangle with all three sides the same length

Isosceles Triangle – A triangle with two sides the same length

Parallel Lines – Lines that never meet no matter how long they are extended. The opposite sides of a square or rectangle are parallel.

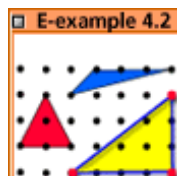
Vertex – Angles are formed by two rays that have the same endpoint, this endpoint is called the **vertex**.

Web Resources

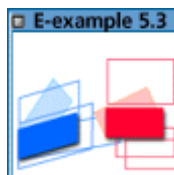
You will find web resources at:

www.illuminations.nctm.org

Investigating Properties of Triangles



Exploring Properties of Rectangles and Parallelograms



Connected Mathematics Project

Everett Public Schools Mathematics Program

Shapes and Designs

Two-Dimensional Geometry

Unit Goals

- ◆ Understand the relationships between and among polygons
- ◆ Learn important properties of polygon
- ◆ Create and determine properties of shapes that tile a surface
- ◆ Explore symmetries in squares, rectangles, parallelograms, and equilateral triangles.

Proposed Time Frame:
Approximately 6 weeks

Mathematics in Investigations

Investigation 1 Bees and Polygons

- * Discover which regular polygons can tile a plane.
- * Discover combinations of regular polygons that can be used to tile a plane
- * Discover that some irregular polygons can be used to tile a plane.

Investigation 2 Building Polygons

- * Understand that triangle are stable figures that keep their shape under stress
- * Discover that the sum of the lengths of any two sides of a triangle is greater than the length of the third side.
- * Discover that quadrilaterals and other polygons are not stable shapes and become distorted under stress
- * Discover that the sum of the lengths of any three sides of a quadrilateral is greater than the length of the fourth side.

Investigation 3 Polygons and Angles

- * Develop and understanding of what an angle is and find examples in the real world
- * Understand the measure of an angle
- * 360° , is a full circle, 180° is a half circle, 90° is a quarter circle
- * Use angles and angle measures in real-life applications

Investigation 4 Polygon Properties and Tiling

- * Use information about angles to test potential tiling patterns
- * Show how regular hexagons can be used to tile
- * Understand that most other polygons do not tile
- * Understand that circular shapes do not tile

Investigation 5 Side-Angle-side Connections

- * Recognize and describe flips and turns that will return a triangle, square, rectangle, or parallelogram to its original orientation
- * Understand the properties of sides and angles in isosceles and equilateral triangles, squares, rectangles, and parallelograms



Tips for Helping at Home

Good questions and good listening will help children make sense of mathematics and build self-confidence. A good question opens up a problem and supports different ways of thinking about it. Here are some questions you might try, notice that none of them can be answered with a simple “yes” or “no”.

Getting Started

- * What do you need to find out?
- * What do you need to know?
- * What terms do you understand or not understand?

While Working

- * How can you organize the information?
- * Do you see any patterns or relationships that will help solve this?
- * What would happen if...?

Reflecting about the Solution

- * How do you know your answer is reasonable?
- * Has the question been answered?
- * Can you explain it another way?

At Home:

- 1 Talk with your child about what’s going on in mathematics class.
- 2 Look for ways to link mathematical learning to daily activities. Encourage your child to figure out the amounts for halving a recipe, estimating gas mileage, or figuring a restaurant tip.
- 3 Encourage your child to schedule a regular time for homework and provide a comfortable place for their study, free from distractions.
- 4 Monitor your child’s homework on a regular basis by looking at one problem or asking your child to briefly describe the focus of the homework. When your child asks for help, work with them instead of doing the problem for them.

At School

- 1 Attend Open House, Back to School Night, and after school events.
- 2 Join the parent-teacher organization

Connected Mathematics Project

Phone: 425-385-4062

Fax: 425-385-4092

Email: mstine@everett.wednet.edu