North Penn School District

Elementary Math Parent Letter

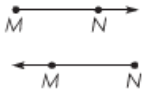
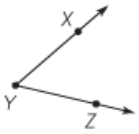
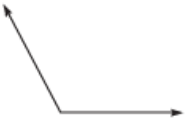
Grade 4

Unit 5 – Chapter 10: Two-Dimensional Figures

Examples for each lesson:

Lesson 10.1

Lines, Rays, and Angles

Name	What it looks like	Think
point *D*		A **point** names a location in space.
line *AB*; $\overleftrightarrow{AB}$ line *BA*; $\overleftrightarrow{BA}$		A **line** extends without end in opposite directions.
line segment *AB*; $\overline{AB}$ line segment *BA*; $\overline{BA}$		"Segment" means part. A **line segment** is part of a line. It is named by its two endpoints.
ray *MN*; $\overrightarrow{MN}$ ray *NM*; $\overrightarrow{NM}$		A **ray** has one endpoint and extends without end in one direction. A ray is named using two points. The endpoint is always named first.
angle *XYZ*; $\angle XYZ$ angle *ZYX*; $\angle ZYX$ angle *Y*; $\angle Y$		Two rays or line segments that share an endpoint form an angle. The shared point is the vertex of the angle.
A **right angle** forms a square corner. 	An **acute angle** opens less than a right angle. 	An **obtuse angle** opens more than a right angle and less than a straight angle. 	A **straight angle** forms a line.

More information on this strategy is available on Animated Math Models #38, 39.

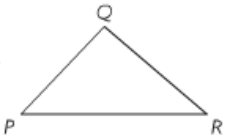
Lesson 10.2

Classify Triangles

A **triangle** is a polygon with 3 sides and 3 angles.
Each pair of sides joins at a vertex.

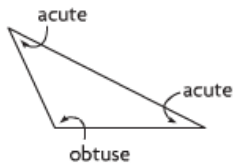
You can name a triangle by its vertices.

ΔPQR ΔQRP ΔRPQ
ΔPRQ ΔQPR ΔRQP

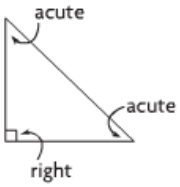


There are 3 types of triangles. All triangles have at least 2 acute angles.

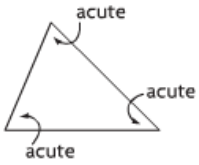
Obtuse triangle
one obtuse angle



Right triangle
one right angle



Acute triangle
three acute angles

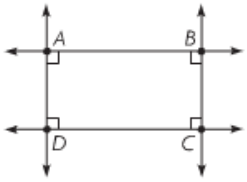


Lesson 10.3

Parallel Lines and Perpendicular Lines

Parallel lines are lines in a plane that are always the same distance apart. Parallel lines or line segments never meet.

In the figure, lines AB and CD, even if extended, will never meet.
The lines are parallel. Write $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.
Lines AD and BC are also parallel. So, $\overleftrightarrow{AD} \parallel \overleftrightarrow{BC}$.



Intersecting lines cross at exactly one point. Intersecting lines that form right angles are **perpendicular.**

In the figure, lines AD and AB are perpendicular because they form right angles at vertex A. Write $\overleftrightarrow{AD} \perp \overleftrightarrow{AB}$.

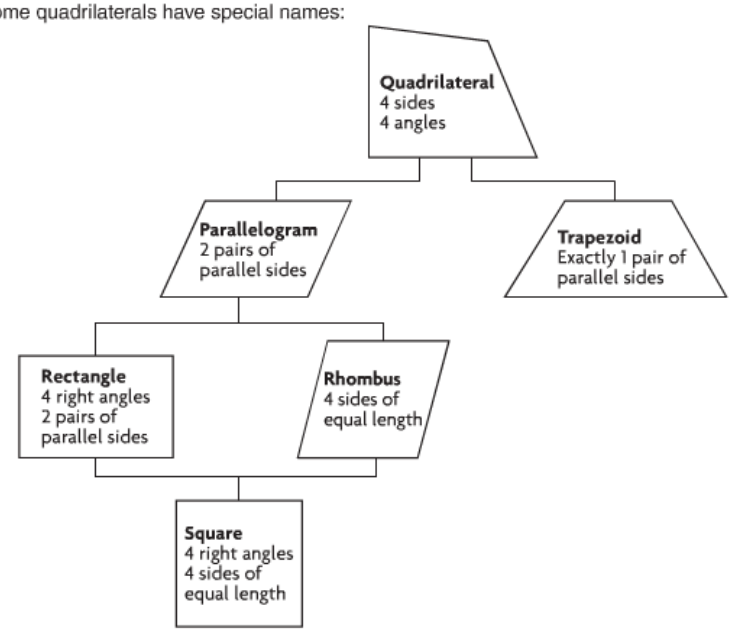
Lines BC and CD are also perpendicular. So, $\overleftrightarrow{BC} \perp \overleftrightarrow{CD}$.

More information on this strategy is available on Animated Math Model #40.

Lesson 10.4

Classify Quadrilaterals

A **quadrilateral** is a polygon with 4 sides and 4 angles.
Some quadrilaterals have special names:

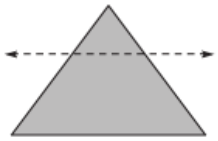


More information on this strategy is available on Animated Math Model # 41.

Lesson 10.5

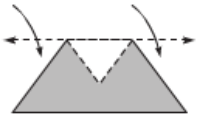
Line Symmetry

Tell whether the parts on each side of the line match.
Is the line a line of symmetry?



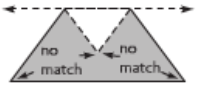
Step 1 Trace and cut out the shape.

Fold the shape along the dashed line.



Step 2 Tell whether the parts on each side match.

Compare the parts on each side.



The parts do not match.

Step 3 Decide if the line is a line of symmetry.

The parts on each side of the line do not match.

So, the line is not a line of symmetry.

More information on this strategy is available on Animated Math Model # 42.

Lesson 10.6

Find and Draw Lines of Symmetry

Tell whether the shape appears to have zero lines, 1 line, or more than 1 line of symmetry. Write *zero, 1,* or *more than 1*.

Step 1 Decide if the shape has a line of symmetry.

Trace and cut out the shape. Fold the shape along a vertical line.

Do the two parts match exactly? yes

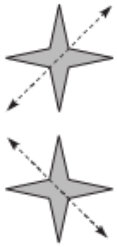
Step 2 Decide if the shape has another line of symmetry.

Open the shape and fold it along a horizontal line.

Do the two parts match exactly? yes

Step 3 Find any other lines of symmetry.

Think: Can I fold the shape in other ways so that the two parts match exactly?



I can fold the paper diagonally two different ways, and the parts match exactly.

So, the shape appears to have more than 1 line of symmetry.

More information on this strategy is available on Animated Math Model # 42.

Lesson 10.7

Problem Solving • Shape Patterns

Use the strategy *act it out* to solve pattern problems.

What might be the next three figures in the pattern below?

Read the Problem		
What do I need to find? I need to find the next three figures in the pattern.	**What information do I need to use?** I need to look for a group of figures that repeat.	**How will I use the information?** I will use pattern blocks to model the pattern and act out the problem.
Solve the Problem		
Look for a group of figures that repeat and circle that group. The repeating group is triangle, triangle, square, triangle, square. I used triangles and squares to model and continue the pattern by repeating the figures in the group. These are the next three figures in the pattern: 		

More information on this strategy is available on Animated Math Model # 43.

<u>Vocabulary</u>

Acute angle – an angle that has a measure less than a right angle

Line – a straight path of points that continues without end in both directions

Line of symmetry – an imaginary line that divides a shape into two congruent parts

Line symmetry – what a shape has if it can be folded about a line so that its two parts match exactly

Obtuse angle – an angle that has a measure greater than a right angle

Ray – a part of a line, with one endpoint, that is straight and continues in one direction

Right angle – an angle that forms a square corner and has a measure of 90°

Straight angle – an angle in which two rays point in opposite directions so that they form a line