Name: Jack

1. Use the following directions to draw a figure in the box to the right.
   a. Draw two points, A and B.
   b. Use a straightedge to draw AB.
   c. Draw a new point that is not on AB. Label it C.
   d. Draw segment AC.
   e. Draw a point not on AB or AC. Call it D.
   f. Construct line, CD.
   g. Use the points you've already labeled to name one angle. \( \angle BAC \)

2. Use the following directions to draw a figure in the box to the right.
   a. Draw two points, A and B.
   b. Use a straightedge to draw AB.
   c. Draw a new point that is not on AB. Label it C.
   d. Draw BC.
   e. Draw a new point that is not on AB or BC. Label it D.
   f. Construct AD.
   g. Identify \( \angle DAB \) by drawing an arc to indicate the position of the angle.
   h. Identify another angle by referencing points that you have already drawn. \( \angle ABC \)
3.  
   a. Observe the familiar figures below.
   b. Label points on each figure and then use those points to label and name representations of each of the following in the table below: ray, line, line segment, and angle. Extend segments to show lines and rays.

```
<table>
<thead>
<tr>
<th>ray</th>
<th>line</th>
<th>line segment</th>
<th>angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>QR</td>
<td>TS</td>
<td>LQPT</td>
</tr>
<tr>
<td>AC</td>
<td>AB</td>
<td>BD</td>
<td>LBDC</td>
</tr>
<tr>
<td>AE</td>
<td>NS</td>
<td>AB</td>
<td>L XAS</td>
</tr>
</tbody>
</table>
```

BONUS: Draw a familiar figure. Label it with points and then identify rays, lines, line segments, and angles as applicable.

```
\[ \overrightarrow{OD} \text{ (ray)} \]
\[ \overrightarrow{MN} \text{ (line segment)} \]
\[ \angle \text{NOL (angle)} \]
```

engageNY

Lesson 1: Identify and draw points, lines, line segments, rays and angles and recognize them in various contexts and familiar figures.

Date: 9/6/13

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equal to

less than

greater than

greater than

greater than

Use right angles to determine whether angles are equal to, greater than, or less than right angles. Draw right, obtuse, and acute angles.
1. Use the right angle template that you made in class to determine if each of the following angles is greater than, less than, or equal to a right angle. Label each as greater than, less than, or equal to, and then connect each angle to the correct label of acute, right, or obtuse. The first one has been completed for you.
2. Use your right angle template to identify acute, obtuse, and right angles within Picasso's painting *Factory, Horta de Ebro*. Trace at least two of each, label with points, and then name them in the table below the painting.


<table>
<thead>
<tr>
<th>Angle Type</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute angle</td>
<td>∠GHI</td>
<td>∠JKL</td>
</tr>
<tr>
<td>Obtuse angle</td>
<td>∠ABC</td>
<td>∠DEF</td>
</tr>
<tr>
<td>Right angle</td>
<td>∠MKN</td>
<td>∠PQR</td>
</tr>
</tbody>
</table>
3. Construct each of the following using a straightedge and/or the right angle template that you created. Explain the characteristics of each by comparing the angle to a right angle. Use the words greater than, less than, or equal to in your explanations.

a. acute angle

This is an acute angle. It is less than a right angle.

b. right angle

This angle is equal to a right angle.

c. obtuse angle

This obtuse angle is greater than a right angle.
1. On each object, trace at least one pair of lines that appear to be perpendicular.

2. How do you know if two lines are perpendicular?

   When two lines are perpendicular they make a right angle.

3. In the square and triangular grids below, use the given segments in each grid to draw a line that is perpendicular using a straightedge.
4. Use the right angle template that you created in class to determine which of the following have a right angle. Mark each right angle with a small square. For each right angle you find, name the corresponding pair of perpendicular lines. (See 4(a) for one example of this.)

a. 

$$\overline{AB} \perp \overline{BD}$$

b. 

No right angles

c. 

$$\overline{GE} \perp \overline{EF}$$

d. 

No right angles

e. 

$$\overline{FW} \perp \overline{WA}$$

f. 

No right angles

g. 

No right angles

h. 

$$\overline{YX} \perp \overline{WX}$$
5. Mark each right angle in the following figure with a small square. (Note that a right angle does not have to be inside the figure.) How many pairs of perpendicular sides does this figure have?

There are 12 right angles.

6. True or false? Shapes that have at least one right angle also have at least one pair of perpendicular sides. Explain your thinking.

It is true. Right angles are created by lines that are perpendicular so if a figure has a right angle it must have perpendicular lines.
Name: Jack  Date: 

1. On each object, trace at least one pair of lines that appear to be parallel.

2. How do you know if two lines are parallel?
   
   These lines are parallel because they will never intersect.

3. In the square and triangular grids below, use the given segments in each grid to draw a line that is parallel using a straightedge and your right angle template.

4. Determine which of the following
figures have lines that are parallel by using a straightedge and the right angle template that you created. Circle the letter of the shapes that have at least one pair of parallel lines. Mark each pair of parallel lines with arrows and then identify the parallel lines with a statement modeled after the one in 4a.

\[ \overline{AB} \parallel \overline{CD} \]

\[ \overline{HI} \parallel \overline{JK} \]

\[ \overline{ZA} \parallel \overline{FW} \]

\[ \overline{TO} \parallel \overline{RQ} \]

\[ yX \parallel \overline{VW} \]
5. True or false? A triangle cannot have sides that are parallel. Explain your thinking.

True. A triangle only has 3 sides so it can never have one side that won't ever touch one of the other ones.

6. Explain why $\overline{AB}$ and $\overline{CD}$ are parallel but $\overline{EF}$ and $\overline{GH}$ are not.

$\overline{AB}$ and $\overline{CD}$ are parallel because they will never intersect. $\overline{EF}$ and $\overline{GH}$ will intersect so they are not parallel.

7. Draw a line using your straightedge. Now use your right angle template and straightedge to construct a line parallel to the first line you drew.
Name: Jack Date: 

1. Make a list of the measures of the benchmark angles you drew starting with Set A. Round each angle measure to the nearest 5 degrees. Both sets are started for you.

   a. Set A: 45 degrees, 90 degrees, 135 degrees, 180 degrees, 225 degrees, 270 degrees, 315 degrees, 360 degrees
   b. Set B: 30 degrees, 60 degrees, 90 degrees, 120 degrees, 150 degrees, 180 degrees, 210 degrees, 240 degrees, 270 degrees, 300 degrees, 330 degrees, 360 degrees

2. Circle any angle measures that appear on both lists. What do you notice about them?

   They are all quarter turns and right angles.

3. List the angle measures from Problem 1 that are acute. Trace each angle with your finger as you say its measurement.

   30 degrees, 45 degrees, 60 degrees

4. List the angle measures from Problem 1 that are obtuse. Trace each angle with your finger as you say its measurement.

   120 degrees, 135 degrees, 150 degrees
5. We found out today that 1 degree is \( \frac{1}{360} \) of a whole turn. It is 1 out of 360 degrees. That means a 2 degree angle is \( \frac{2}{360} \) of a whole turn. What fraction of a whole turn is each of the benchmark angles you listed in Problem 1?

\[
\begin{align*}
30 & \quad 45 & \quad 60 & \quad 90 & \quad 120 & \quad 135 & \quad 150 & \quad 180 \\
\frac{30}{360} & \quad \frac{45}{360} & \quad \frac{60}{360} & \quad \frac{90}{360} & \quad \frac{120}{360} & \quad \frac{135}{360} & \quad \frac{150}{360} & \quad \frac{180}{360} \\
\frac{210}{360} & \quad \frac{225}{360} & \quad \frac{240}{360} & \quad \frac{270}{360} & \quad \frac{300}{360} & \quad \frac{315}{360} & \quad \frac{330}{360} & \quad \frac{360}{360}
\end{align*}
\]

6. How many 45 degree angles does it take to make a full turn?

It takes 8 45 degree angles to make a full turn.

7. How many 30 degree angles does it take to make a full turn?

It takes 12 30 degree angles to make a full turn.

8. If you didn't have a protractor, how could you reconstruct the quarter of it from 0 degrees to 90 degrees?

You could use two 45 degree angles or three 30 degree angles put together.
1. Use a protractor to measure the angles and then record the measurements in degrees.
   a. 
   b. 

   ![Diagram with angles 32°, 36°, 90°, 90°]
Use various protractors to distinguish angle measures from length measurements.
2. a. Use three different sized protractors to measure the angle. Extend the lines as needed using a straightedge.

Protractor #1: 27°
Protractor #2: 27°
Protractor #3: 27°

b. What do you notice about the measurement of the above angle using each of the protractors?

The angle always measured 27° whether I used a smaller or larger protractor.

3. Use a protractor to measure each angle. Extend the length of the lines if you need to. When you extend the lines, does the angle measure stay the same? Explain how you know.

a.

Angle measure stays the same because you are not changing anything at the point where the sides meet.
1. Construct angles that measure the given number of degrees. For a-d, use the ray shown as one of the rays of the angle with its endpoint as the vertex of the angle. Draw an arc to indicate the angle that was measured.

   a. 30°

   b. 45°

   c. 60°

   d. 90°
e. $135^\circ$

f. $180^\circ$

g. $225^\circ$

h. $270^\circ$

i. $315^\circ$

j. $360^\circ$
Lesson 7: Measure and draw angles. Sketch given angle measures and verify with a protractor.

Date: 10/16/13

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1. Joe, Steve, and Bob stood in the middle of the yard and faced the house. Joe turned 90° to the right. Steve turned 180° to the right. Bob turned 270° to the right. To what was each boy now facing?

   Joe ______ fence
   Steve ______ tree
   Bob ______ barn

2. Monique looked at the clock at the beginning of class and at the end of class. How many degrees did the minute hand turn from the beginning of class until the end?

   Beginning ______
   End ______

   The minute hand moved 270 degrees.

3. The skater jumped into the air and did a ‘360’. What does that mean?

   It means that he turned all the way around in a complete circle and he is facing the way he started.

4. Mr. Martin drove away from his house without his wallet. He ‘did a 180’. Where was he heading now?

   He is heading back to his house.

   House ______
   Store ______

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5. John turned the knob of the shower 270° to the right. Draw a picture showing the position of the knob after he turned it.

6. Barb used her scissors to cut out a coupon from the newspaper. How many quarter turns does she need to turn her scissors in order to stay on the lines? She needs to make four quarter-turns.

7. How many quarter turns does the picture need to be rotated in order for it to be upright? It needs to be rotated either one quarter-turn to the left or three quarter-turns to the right.

8. Meredith faced north. She turned 90° to the right and then 180°. In what direction was she now facing? She is now facing West.
1. Complete the table.

<table>
<thead>
<tr>
<th>Pattern Block</th>
<th>Total number that fit around 1 vertex</th>
<th>One interior angle measures...</th>
<th>Sum of the angles around a vertex</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>4</td>
<td>$360° \div 4 = 90°$</td>
<td>$90° + 90° + 90° + 90° = 360°$</td>
</tr>
<tr>
<td>b.</td>
<td>6</td>
<td>$360° \div 6 = 60°$</td>
<td>$60° + 60° + 60° + 60° + 60° + 60° = 360°$</td>
</tr>
<tr>
<td>c.</td>
<td>3</td>
<td>$360° \div 3 = 120°$</td>
<td>$120° + 120° + 120° = 360°$</td>
</tr>
<tr>
<td>d.</td>
<td>6</td>
<td>$360° \div 6 = 60°$</td>
<td>$60° + 60° + 60° + 60° + 60° + 60° = 360°$</td>
</tr>
<tr>
<td>e.</td>
<td>3</td>
<td>$360° \div 3 = 120°$</td>
<td>$120° + 120° + 120° = 360°$</td>
</tr>
<tr>
<td>f.</td>
<td>12</td>
<td>$360° \div 12 = 30°$</td>
<td>$30° + 30° + 30° + 30° + 30° + 30° = 360°$</td>
</tr>
</tbody>
</table>
2. Find the measurements of the angles indicated by the arcs.

<table>
<thead>
<tr>
<th>Pattern Blocks</th>
<th>Angle Measure</th>
<th>Addition Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Diagram A" /></td>
<td>150°</td>
<td>60° + 90° = 150°</td>
</tr>
<tr>
<td><img src="image2" alt="Diagram B" /></td>
<td>180°</td>
<td>60° + 120° = 180°</td>
</tr>
<tr>
<td><img src="image3" alt="Diagram C" /></td>
<td>210°</td>
<td>120° + 90° = 210°</td>
</tr>
</tbody>
</table>

3. Use two or more pattern blocks to figure out the measurements of the angles indicated by the arcs.

<table>
<thead>
<tr>
<th>Pattern Blocks</th>
<th>Angle Measure</th>
<th>Addition Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Diagram D" /></td>
<td>60°</td>
<td>30° + 30° = 60°</td>
</tr>
<tr>
<td><img src="image5" alt="Diagram E" /></td>
<td>210°</td>
<td>120° + 90° = 210°</td>
</tr>
<tr>
<td><img src="image6" alt="Diagram F" /></td>
<td>120°</td>
<td>90° + 30° = 120°</td>
</tr>
</tbody>
</table>
Write an equation and solve for the measure of $\angle x$. Verify the measurement using a protractor.

1. $\angle CBA$ is a right angle.
   
   $\angle CBA = \frac{45^\circ}{90^\circ}$
   
   $x^\circ = 45^\circ$

2. $\angle GFE$ is a right angle.
   
   $\angle GFE = \frac{20^\circ + 70^\circ}{90^\circ}
   
   $x^\circ = 70^\circ$

3. $\angle ljk$ is a straight angle.
   
   $110^\circ + 70^\circ = 180^\circ$
   
   $x^\circ = 110^\circ$

4. $\angle MNO$ is a straight angle.
   
   $83^\circ + 97^\circ = 180^\circ$
   
   $x^\circ = 97^\circ$
Directions: Solve for the unknown angle measurements. Write an equation to solve.

5. Solve for the measurement of \( \angle TRU \).
\( \angle QRS \) is a straight angle.
\[
90^\circ + 36^\circ + 54^\circ = 180^\circ \]
\( \angle TRU = 54^\circ \)

6. Solve for the measurement of \( \angle ZYV \).
\( \angle XYZ \) is a straight angle.
\[
108^\circ + 60^\circ + 12^\circ = 180^\circ \]
\( \angle ZYV = 12^\circ \)

7. In the following figure ACDE is a rectangle. Without using a protractor, determine the measurement of \( \angle DEB \). Write an equation that could be used to solve the problem.
\[
90^\circ - 27^\circ = 63^\circ \]
\( \angle DEB = 63^\circ \)

8. Complete the following directions in the space to the right.

   a. Draw 2 points \( M \) and \( N \). Using a straightedge, draw \( MN \).
   b. Plot a point \( O \) somewhere between points \( M \) and \( N \).
   c. Plot a point \( P \), which is not on \( MN \).
   d. Draw \( OP \).
   e. Find the measure of \( \angle MOP \) and \( \angle NOP \).
   f. Write an equation to show that the angles add to the measure of a straight-angle.

\[
\angle MOP = 125^\circ \quad \angle NOP = 55^\circ \]
\[
125^\circ + 55^\circ = 180^\circ \]
Write an equation and solve for the unknown angle measurements numerically.

1. \[340^\circ + 20^\circ = 360^\circ\]
   \[d^\circ = 340^\circ\]

2. \[270^\circ + 90^\circ = 360^\circ\]
   \[c^\circ = 270^\circ\]

3. \[74^\circ + 90^\circ + 196^\circ = 360^\circ\]
   \[e^\circ = 196^\circ\]

4. \[90^\circ + 160^\circ + 110^\circ = 360^\circ\]
   \[f^\circ = 110^\circ\]
Write an equation and solve for the unknown angles numerically.

5. \( O \) is the intersection of \( \overline{AB} \) and \( \overline{CD} \).
   \( DOA \) is 160° and \( AOC \) is 20°

\[
x° = 160° \quad y° = 20°
\]

\[
\angle x + 20° = 180° \quad \angle y = 180° - 160° \quad \angle y = 20°
\]

6. \( O \) is the intersection of \( \overline{RS} \) and \( \overline{TV} \).
   \( TOS \) is 125°.

\[
g° = \frac{55°}{h° = 125°} \quad i° = 55°
\]

\[
180° - 125° = g° \quad 180° - 55° = h°
\]

\[
55° = g° \quad 125° = h°
\]

\[
180° - 125° = i° \quad \quad 55° = i°
\]

7. \( O \) is the intersection of \( \overline{WX}, \overline{YZ}, \) and \( \overline{UO} \).
   \( XOZ \) is 36°.

\[
k° = 36° \quad m° = 54° \quad n° = 144°
\]

\[
180° - 36° = n° \quad \quad 144° = n°
\]

\[
180° - 36° - 90° = m° \quad \quad 54° = m°
\]

\[
k° = 180° - 144° \quad k° = 36°
\]
1. Circle the figures that have a correct line of symmetry drawn.

   a. [Diagram]
   b. [Diagram]
   c. [Diagram]
   d. [Diagram]

2. Find and draw all lines of symmetry for the following figures. Write the number of lines of symmetry that you found in the blank underneath the shape.

   a. [Diagram] 4
   b. [Diagram] 4
   c. [Diagram] 0
   d. [Diagram] 6
   e. [Diagram] 1
   f. [Diagram] 0
   g. [Diagram] 1
   h. [Diagram] 1
   i. [Diagram] 4
3. Half of each figure below has been drawn. Use the line of symmetry, represented by the dashed line, to complete each figure.

![Figure A]

![Figure B]

![Figure C]

![Figure D]

4. The figure below is a circle. How many lines of symmetry does the figure have? Explain.

It has too many to count! It has an infinite number. No matter where you fold it in half, it would work!
Figure 2

Figure 3

Lesson 12: Recognize lines of symmetry for given two-dimensional figures; identify line-symmetric figures and draw lines of symmetry.

Date: 10/16/13
<table>
<thead>
<tr>
<th>Sketch of Triangle</th>
<th>Attributes (Include side lengths, angle measures.)</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>[\overline{XZ}] 12.5 cm [\overline{XY}] 12.5 cm [\overline{YZ}] 12.5 cm [\angle X] 60° [\angle Y] 60° [\angle Z] 60°</td>
<td>Equilateral Acute</td>
</tr>
<tr>
<td>B</td>
<td>[\overline{UW}] 13.8 cm [\overline{UV}] 13.8 cm [\overline{WV}] 9.8 cm [\angle U] 40° [\angle V] 70° [\angle W] 70°</td>
<td>Isosceles Acute</td>
</tr>
<tr>
<td>C</td>
<td>[\overline{TR}] 8 cm [\overline{TS}] 12.5 cm [\overline{RS}] 18.7 cm [\angle R] 30° [\angle S] 19° [\angle T] 131°</td>
<td>Scalene Obtuse</td>
</tr>
<tr>
<td>D</td>
<td>[\overline{OP}] 14.3 cm [\overline{PQ}] 10.3 cm [\overline{OQ}] 17.7 cm [\angle O] 35° [\angle P] 55° [\angle Q] 90°</td>
<td>Scalene Right</td>
</tr>
<tr>
<td>E</td>
<td>[\overline{IN}] 14.3 cm [\overline{IM}] 20.2 cm [\overline{MN}] 14.3 cm [\angle I] 45° [\angle M] 45° [\angle N] 90°</td>
<td>Isosceles Right</td>
</tr>
<tr>
<td>F</td>
<td>[\overline{IK}] 18.8 cm [\overline{IJ}] 11.5 cm [\overline{JK}] 11.2 cm [\angle I] 35° [\angle J] 110° [\angle K] 35°</td>
<td>Scalene Obtuse</td>
</tr>
</tbody>
</table>
Lesson 13: Analyze and classify triangles based on side length, angle measure, or both.

Date: 10/16/13
1. Classify each triangle by its side lengths and angle measurements. Circle the correct names.

<table>
<thead>
<tr>
<th></th>
<th>Classify Using Side Lengths</th>
<th>Classify Using Angle Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>![Triangle Image]</td>
<td>Equilateral  Isosceles  Scalene</td>
</tr>
<tr>
<td>b.</td>
<td>![Triangle Image]</td>
<td>Equilateral  Isosceles  Scalene</td>
</tr>
<tr>
<td>c.</td>
<td>![Triangle Image]</td>
<td>Equilateral  Isosceles  Scalene</td>
</tr>
<tr>
<td>d.</td>
<td>![Triangle Image]</td>
<td>Equilateral  Isosceles  Scalene</td>
</tr>
</tbody>
</table>

2. \(ABC\) has one line of symmetry as shown. What does this tell you about the measures of \(\angle A\) and \(\angle C\)?

They must be the same! The sides of symmetrical shapes have to match when you fold it! That is what the line of symmetry means. The angles match.

3. \(DEF\) has three lines of symmetry as shown.
   a. How can the lines of symmetry help you figure out which angles are equal?
   No matter which line you fold it on, the opposite angles would be the same, so they all have to be the same.

   b. \(DEF\) has a perimeter of 30 cm. Label the side lengths.
   \[30\text{ cm} \div 3 = 10\text{ cm}\]
4. Use a ruler to connect points to form 2 other triangles. Use each point only once. None of the triangles may overlap. One or two points will be unused. Name and classify the 3 triangles below.

![Diagram showing points A, B, C, D, E, F, G, H, J, K]

<table>
<thead>
<tr>
<th>Name the Triangles Using Vertices</th>
<th>Classify by Side Length</th>
<th>Classify by Angle Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>FJK</td>
<td>scalene</td>
<td>obtuse</td>
</tr>
<tr>
<td>Δ ABC</td>
<td>scalene</td>
<td>obtuse</td>
</tr>
<tr>
<td>Δ EDH</td>
<td>isosceles</td>
<td>right</td>
</tr>
</tbody>
</table>

5.

a. List three points from the grid above that, when connected by segments, do not result in a triangle.
   - G, I, H

b. Why didn’t the three points you listed result in a triangle when connected by segments?
   - The wouldn’t make anything except a line! We can’t use them to make 3 sides and 3 angles.

c. Can a triangle have 2 right angles? Explain.
   - No! If we have 2 right angles, there wouldn’t be a way to connect 2 of the sides. We couldn’t make our third corner.

Lesson 13:
Analyze and classify triangles based on side length, angle measure, or both.
Date: 10/15/13
1. Draw triangles that fit the following classifications. Use a ruler and protractor. Label the side lengths and angles.

   a. right and isosceles
   
   ![Right Isosceles Triangle](image)

   b. obtuse and scalene
   
   ![Obtuse Scalene Triangle](image)

   c. acute and scalene
   
   ![Acute Scalene Triangle](image)

   d. acute and isosceles
   
   ![Acute Isosceles Triangle](image)

2. Draw all possible lines of symmetry in the triangles above. Explain why some of the triangles do not have lines of symmetry.

   In scalene triangles, there aren't any sides of the same length so you wouldn't be able to fold it in a way so the sides match exactly.
Are the following statements true or false? Explain using pictures or words.

3. If \( \triangle ABC \) is an equilateral triangle, \( BC \) must be 2 cm. True or False?
   
   False. "Equilateral" means all the sides are the same, so \( BC \) has to be 1 cm.

4. A triangle cannot have one obtuse angle and one right angle. True or False?
   
   True! If you have a right angle and an obtuse angle, there is no way the sides could connect to make the third corner.

5. \( \triangle EFG \) can be described as a right triangle and an isosceles triangle. True or False?
   
   It is both! It has a right angle and two sides with the same length.

6. An equilateral triangle is isosceles. True or False?
   
   True. Isosceles means it has at least 2 sides that are the same length. Equilateral triangles have 3 sides that are the same length!

Extension: In \( \triangle HJI \), \( a = b \). True or False?

True! We can use a line of symmetry to show the angles have to match.
Construct the figures with given attributes. Name the shape you created. Be as specific as possible. Use extra blank paper as needed.

1. Construct quadrilaterals with at least one set of parallel sides.

   ABCD is a trapezoid. It has 4 sides and 1 set of parallel lines.

2. Construct a quadrilateral with two sets of parallel sides.

   EFGH is a parallelogram and a trapezoid, too. It has 4 sides and 2 sets of parallel lines.

3. Construct a parallelogram with four right angles.

   PQRS is a parallelogram with 4 right angles. The sides are not all the same, so it is a rectangle.

4. Construct a rectangle with all sides the same length.

   LMNO is a shape with 4 equal sides and 4 right angles. It is a square.
5. Use the word bank to name each shape, being as specific as possible.

<table>
<thead>
<tr>
<th>parallelogram</th>
<th>trapezoid</th>
<th>rectangle</th>
<th>square</th>
</tr>
</thead>
</table>

a. trapezoid
b. parallelogram
c. square
d. rectangle

6. Explain the attribute that makes a square a special rectangle.

In a square, all of the sides are the same length. It still has 4 right angles like a rectangle.

7. Explain the attribute that makes a rectangle a special parallelogram.

A rectangle has 4 right angles.

8. Explain the attribute that makes a parallelogram a special trapezoid.

A parallelogram needs 2 sets of parallel lines, but a trapezoid could have just one set.

COMMON CORE LESSON 15: Classify quadrilaterals based on parallel and perpendicular lines and the presence or absence of angles of a specified size.

Date: 10/16/13
1. On the grid paper, draw at least one quadrilateral to fit the description. Use the given segment as one segment of the quadrilateral. Name the figure you drew using one of the terms below.

<table>
<thead>
<tr>
<th>parallelogram</th>
<th>trapezoid</th>
<th>rectangle</th>
</tr>
</thead>
<tbody>
<tr>
<td>square</td>
<td></td>
<td>rhombus</td>
</tr>
</tbody>
</table>

a. A quadrilateral that has at least one pair of parallel sides.

b. A quadrilateral that has four right angles.

c. A quadrilateral that has two pairs of parallel sides.

d. A quadrilateral that has at least one pair of perpendicular sides and at least one pair of parallel sides.
2. On the grid paper, draw at least one quadrilateral to fit the description. Use the given segment as one segment of the quadrilateral. Name the figure you drew using one of the terms below.

<table>
<thead>
<tr>
<th>parallelogram</th>
<th>trapezoid</th>
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</tr>
</thead>
<tbody>
<tr>
<td>square</td>
<td></td>
<td>rhombus</td>
</tr>
</tbody>
</table>

a. A quadrilateral that has two sets of parallel sides.

b. A quadrilateral that has four right angles.

3. Explain the attributes that makes a rhombus different from a rectangle.

   A rhombus has 4 sides that are the same length.
   A rhombus has opposite angles that are the same, but a rectangle has to have 4 right angles.

4. Explain the attribute that makes a square different from a rhombus.

   A square has sides of equal length and 4 right angles.
   A rhombus doesn't need to have right angles. It still has 4 sides of equal length, though.