Math 8
Unit 1 Transformations, Congruence & Similarity

References

Glencoe/McGraw-Hill Text Connection: Chapter 1 Lessons 1-7 & Chapter 2 Lessons 1-6

Glencoe/McGraw-Hill Text Online: connectED.mcgraw-hill.com

Apps available using mheonline.com/apps

Links:

http://www.shodor.org/interactivate/activities/TransmographerTwo/

http://mathbitsnotebook.com/Geometry/Transformations/TRRigidTransformations.html

http://www.xpmath.com/forums/arcade.php?do=play&gameid=115

http://www.sciencekids.co.nz/gamesactivities/math/transformation.html

https://www.mathgames.com/skill/8.17-identify-reflections-rotations-and-translations

https://www.mathgames.com/skill/8.46-

Dear Parents

Welcome to the new school year! We are eager to work with you and your students as we learn new mathematical concepts. In the classroom, students will frequently work on tasks and activities to discover and apply mathematical thinking. Students will be expected to explain or justify their answers and to write clearly and properly. Mathematical content will be organized into units following the Georgia grade 8 curriculum map.

Concepts Students will Use and Understand:

• Develop the concept of transformations and the effects that each type of transformation has on an object;
• Explore the relationship between the original figure and its image in regards to their corresponding parts being moved an equal distance which leads to concept of congruence of figures;
• Learn to describe transformations with both words and numbers;
• Relate rigid motions to the concept of symmetry and to use them to prove congruence or similarity of two figures;
• Physically manipulate figures to discover properties of similar and congruent figures; and
• Focus on the sum of the angles of a triangle and use it to find the measures of angles formed by transversals (especially with parallel lines), find the measures of exterior angles of triangles, and to informally prove congruence.

Vocabulary

Alternate Exterior Angles: Alternate exterior angles are pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on opposite sides of the transversal and are outside the other two lines. When the two other lines are parallel, the alternate exterior angles are equal.

Alternate Interior Angles: Alternate interior angles are pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on opposite sides of the transversal and are in between the other two lines. When the two other lines are parallel, the alternate interior angles are equal.

Angle of Rotation: The amount of rotation about a fixed point.

Congruent Figures: Figures that have the same size and shape

Corresponding Sides: Sides that have the same relative positions in geometric figures

Corresponding Angles: Angles that have the same relative positions in geometric figures

Dilation: Transformation that changes the size of a figure, but not the shape

Linear Pair: Adjacent, supplementary angles. Excluding their common side, a linear pair forms a straight line.

Reflection: A transformation that "flips" a figure over a line of reflection

Reflection Line: A line that is the perpendicular bisector of the segment with endpoints at a pre-image point and the image of that point after a reflection.

Rotation: A transformation that turns a figure about a fixed point through a given angle and a given direction

Same-Side Interior Angles: Pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on the same side of the transversal and are between the

other two lines. When the two other lines are parallel, same-side interior angles are supplementary.

Same-Side Exterior Angles: Pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on the same side of the transversal and are outside the other two lines. When the two other lines are parallel, same-side exterior angles are supplementary.

Scale Factor: The ratio of any two corresponding lengths of the sides of two similar figures

Similar Figures: Figures that have the same shape but not necessarily the same size

Transformation: The mapping, or movement, of all the points of a figure in a plane according to a common operation

Translation: A transformation that "slides" each point of a figure the same distance in the same direction

Transversal: A line that crosses two or more lines

Additional Vocabulary Help:

http://intermath.coe.uga.edu/

Examples:

1. Define and describe two types of dilations.
2. What would be the new coordinates of (2,4), (3,5), (4,3) and (3,2) if you graphed them on a coordinate plane and rotated them 90° about the origin? What quadrant is the new figure in?
3. What is the value of y in the figure below? What is measure of the angle $4y + 16$?
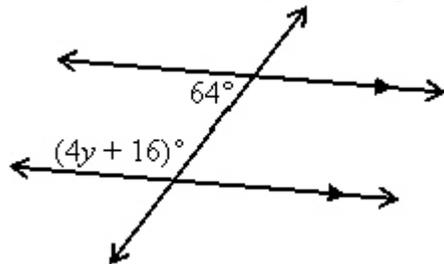
Key:

1. A dilation changes the size of a figure, but not the shape. A dilation could be an enlargement or reduction of a figure.
2. The new coordinates would be: (-3,4), (-5,3), (-4,2), (-2,3) in quadrant II.
3. $4y + 16 + 64 = 180$; $4y + 80 = 180$; $4y = 100$; $y = 25$; measure of the angle is 116.