Transformations

Reporting Category   Geometry

Topic   Applying transformations

Primary SOL   8.8   The student will
                                             a) apply transformations to plane figures; and
                                             b) identify applications of transformations.

Materials
- Table-Top Transformations Recording Sheet (attached)
- Chart-paper-size graph paper
- Markers
- Shapes for Table-Top Transformations handout (attached)
- Scissors

Vocabulary

flip, turn, slide (earlier grades)

transformation, rotation, reflection, translation, dilation, clockwise, counterclockwise (8.8)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Distribute copies of the Table-Top Transformations Recording Sheet. Display a large coordinate plane with cutouts of a rectangle, parallelogram, and right triangle placed on it. (Note: Locate the shapes in accordance with their future transformations shown on the recording sheet!) Have students record on their recording sheets the original position of each shape by listing the ordered pair for each vertex.

2. Distribute copies of the Shapes for Table-Top Transformations handout and scissors. Have students cut out each shape and label each vertex of each shape with the ordered pair for its original position.

3. Divide the class into small groups, and give each group a chart-paper-size sheet of graph paper and a marker. Have students in each group work together to create a coordinate plane on the graph paper and then lay each shape in its original position on the coordinate plane. Then, direct groups to complete each transformation described on their recording sheets and record the new position of each shape. Provide assistance while students work, as needed.

4. When students are finished, discuss the different types of transformations. Have selected students present the transformations they completed.

5. At the end of class, have a student come up and complete a "secret" transformation on large graph paper. Have the other students identify the secret transformation.

Assessment
- **Questions**
  - What is the difference between a counterclockwise 180° rotation and a clockwise 180° rotation? How do you know?

- **Journal/Writing Prompts**
  - Describe examples of transformations encountered in real life.

Extensions and Connections (for all students)
- Have each student draw a figure on graph paper and complete five different transformations of the figure. Then, have students write out the directions for these five transformations and exchange them with other students, who will follow them in order to create the same transformations.
- Have students create tessellations.
- Label each corner of the room with a different type of transformation. Give students sample transformation cards, and have them go to the transformation corners that their samples represent.
- Create a dance routine in which students perform movements based on rotations, reflections, and translations, and label the movements as such.
- Use online resources to model transformations.

Strategies for Differentiation
- Start with all figures in quadrant 1 for the first few examples.
- Have students complete more than one transformation of the same figure.
- Have students use patty paper or tracing paper to complete transformations.
- Have students find examples of transformations within the classroom or on their clothing.
- Provide original figures already drawn so that students only have to draw the transformed figure.
- Use color coding.
- Draw a clock face and arrows, using different colors, to help students distinguish clockwise and counterclockwise.

Table-Top Transformations Recording Sheet

Name _____ **Date** _____

Shape	Original Position	Transformation	New Position
Rectangle	A (　　　　) B (　　　　) C (　　　　) D (　　　　)	Translate 5 units to the left and 3 units up.	A (　　　　) B (　　　　) C (　　　　) D (　　　　)
Parallelogram	W (　　　　) X (　　　　) Y (　　　　) Z (　　　　)	Reflect across the *x*-axis.	W (　　　　) X (　　　　) Y (　　　　) Z (　　　　)
Right Triangle	R (　　　　) S (　　　　) T (　　　　)	Rotate 180° counterclockwise about the origin.	R (　　　　) S (　　　　) T (　　　　)
Rectangle	A (　　　　) B (　　　　) C (　　　　) D (　　　　)	Rotate 90° counterclockwise about the origin.	A (　　　　) B (　　　　) C (　　　　) D (　　　　)
Parallelogram	W (　　　　) X (　　　　) Y (　　　　) Z (　　　　)	Reflect across the *y*-axis.	W (　　　　) X (　　　　) Y (　　　　) Z (　　　　)
Right Triangle	R (　　　　) S (　　　　) T (　　　　)	Translate 2 units to the right and 2 units up.	R (　　　　) S (　　　　) T (　　　　)

Shapes for Table-Top Transformations

Cut out each shape, and label each vertex with the ordered pair for the original position.

A   B

D   C

W   X

Z   Y

R

T   S