

LESSON PLAN (Linda Bolin)

Lesson Title: Lines of Symmetry and Transformations	
Course: Math 7	Date: February Lesson 2
Utah State Core Content and Process Standards: 3.3a, b	
Lesson Objective(s): Identify lines of symmetry in plane figures and translate figures using reflections, translations and rotations.	
Enduring Understanding (Big Ideas): Symmetry and transformations	Essential Questions: <ul style="list-style-type: none">• Where are lines of symmetry found in the real-world? How many lines of symmetry does a shape have?• How does a shape compare to its translation? To its reflection? To its rotation?• What is the difference between a translation, a reflection and a rotation?
Skill Focus: Find lines of symmetry. Transform figures and identify the type of transformation	Vocabulary Focus: symmetry, line of symmetry, translation, rotation, reflection
Materials: one "Lines of Symmetry in Plane Figures" paper for each group of four, scissors for each student, Lines of Symmetry With Pattern Blocks worksheet, Pattern Blocks, a piece of spaghetti or a mirror for each student, colored pencils or crayons, Journal page: Transformations	
Assessment (Traditional/Authentic): observation, performance task, journal page	
Ways to Gain/Maintain Attention (Primacy): manipulatives, cooperative teams, music and movement, folding, sketching and coloring,	
Written Assignment: Symmetry With Pattern Blocks, Transformations With Pattern Blocks, Transformations journal page	

Content Chunks

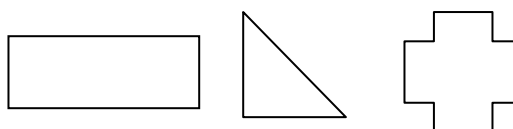
Post vocabulary on Word Wall and refer to the vocabulary throughout the lesson.

Starter:

1. Order from least to greatest $\frac{1}{2}$, $\frac{1}{3}$, .08, 75%

2. Solve this proportion. $\frac{3}{18} = \frac{2}{b}$

3. Give the most specific name for each shape.



Lesson Segment 1: Where are lines of symmetry found in the real-world? How many lines of symmetry does a shape have?

Have students on a team each cut out a shape from the attached Symmetry in Plane Figures page. Ask them to fold each so that half the shape is identical to the other half. Encourage the students to fold the shapes to find as many lines as possible. Have them sketch a dotted line on the fold whenever they find a way to fold the shape so that half the shape matches the other half when folded.

Once each student has completed his/her folding, students should show their team. Team members are to carefully look for any additional lines of symmetry that have not been identified by the team member. Corrections should be made.

Four Corners: Numbering students on a team 1-4, send all #1's to a corner, the #2's to another corner, the 3's to another corner, and the #4's to the remaining corner of the room. In the corner they are to quickly circle up and tell how many lines of symmetry they have discovered for their shape. When the circle agrees, the students return to their teams.

Show students the correct number of lines of symmetry for each shape.

Students can practice lines of symmetry using pattern blocks and the attached assignment paper.

Lesson Segment 2: How does a shape compare to its translation? To its reflection? To its rotation? What is the difference between a translation, a reflection and a rotation?

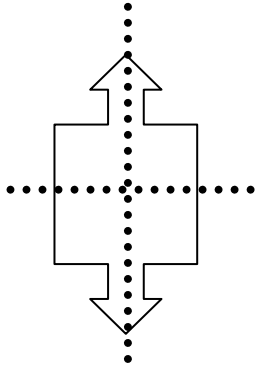
Ask a student to come up to model some vocabulary. Use your body and the student to model a translation (just take a few steps left or right and forward or back), a reflection (pose and ask the student to reflect that pose), and a rotation (you be the pivot point and holding the student's hand rotate them around you, or use your right foot at the pivot as you would in basketball). Help students recognize a 90° turn, a 180° turn, a 270° turn, and a 360° turn as you do this. Once you have modeled these, ask the students to call out which you are performing as you and the student do translations, reflections and rotations.

Have students all do the **Transformations Dance** where you turn on some music and call out the different transformations as students move their bodies to model what you are calling out.

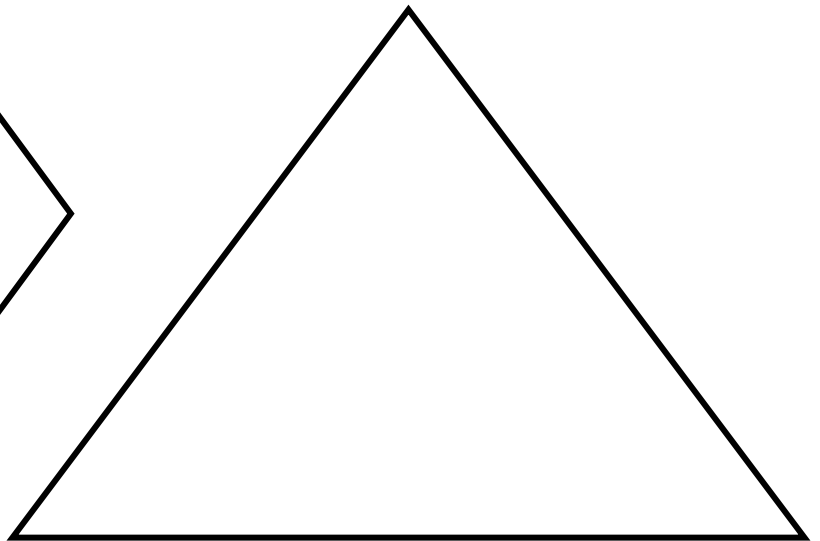
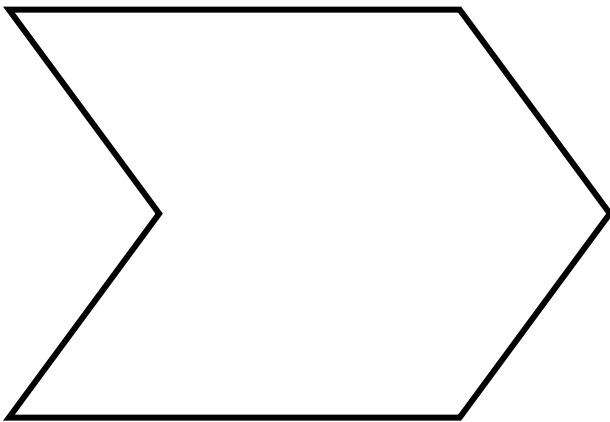
Give each student the Transformations With Pattern Blocks worksheet and the pattern blocks and colored pencils or crayons. Students will create designs using transformations.

Journal: Help students complete the attached Transformations Frayer Model for vocabulary.

Lines of Symmetry In Plane Figures



Cut out each shape below and fold it to find lines of symmetry. Make a dotted line on the fold each time you find a line of symmetry.



Lines of Symmetry With Pattern Blocks

Name _____

In the spaces below, trace each of the Pattern Block pieces. Use a piece of spaghetti or a mirror to find the lines of symmetry. Sketch all the lines of symmetry

1. Equilateral Triangle

There are ____ lines of _____ in this _____.

2. Square

There are ____ lines of _____ in this _____.

3. Trapezoid

There are ____ lines of _____ in this _____.

4. Blue Rhombus

There are ____ lines of _____ in this _____.

5. Tan Rhombus

There are ____ lines of _____ in this _____.

6. Regular Hexagon

There are ____ lines of _____ in this _____.

7. What patterns did you see in the number of lines of symmetry these shapes had?

Transformations

Name _____

Sketch examples		Sketch non examples
Translation		
Write facts, describe or explain		Write a definition

Sketch examples		Sketch non examples
Reflection		
Write facts, describe or explain		Write a definition

Sketch examples		Sketch non examples
Rotation		
Write facts, describe or explain		Write a definition