ROTATIONAL & REFLECTIVE STRIP PATTERNS

BY SHANNON KEALOHA KAIA

Describe the properties of translations, reflections, rotations and dilations and their effects on the figures.

MIDDLE SCHOOL EIGHTH GRADE

TIMEFRAME TWO - THREE DAYS

STANDARD BENCHMARKS AND VALUES

CCSS.Math.Content.8.G.A.1 -
Verify experimentally the properties of rotations, reflections, and translations:

CCSS.Math.Content.8.G.A.1.a -
Lines are taken to lines, and line segments to line segments of the same length.

CCSS.Math.Content.8.G.A.1.b -
Angles are taken to angles of the same measure.

CCSS.Math.Content.8.G.A.1.c -
Parallel lines are taken to parallel lines.

CCSS.Math.Content.8.G.A.3 -
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

CCSS.MATH.PRACTICE.MP1 -
Make sense of problems and persevere in solving them.

CCSS.MATH.PRACTICE.MP4 -
Model with mathematics.

CCSS.MATH.PRACTICE.MP6 -
Attend to precision.

ENDURING UNDERSTANDING

Patterns are found all around us in nature and man made designs.

CRITICAL SKILLS AND CONCEPTS

- Translate, rotate, reflect and dilate shapes on a coordinate plane.
- Describe the effect of translations, rotations, reflections and dilations.
- Understand that two figures are congruent when translating, rotating and reflecting figures.

AUTHENTIC PERFORMANCE TASK:

- Collaborate in groups to find out how to calculate their carbon Students will create their own strip pattern on a coordinate plane. Their strip pattern will demonstrate all four transformations – translations, rotations, reflections and dilations.
- Students will represent all four transformations algebraically.
- Students will describe the effects of all four transformations.
- This will be a culminating activity after students have gone through Modules 9 and 10 in their GoMath! Text book. This will also be used as a summative assessment.

AUTHENTIC AUDIENCE:

Students, educators, administrators, and the community.

LEARNING PLAN

1. Vocabulary: transformation, translation, reflection, rotation, dilation, congruent, point of rotation, center of dilation, scale factor
2. Opening Hook: Show students examples of strip patterns starting with one from the Maori culture, then sharing from my culture: Hawaiian quilt pattern, Tapa cloth, Irish quilts, Korean apron.
3. Students first assignment is to bring in strip patterns that represent their culture.
4. Module 9-10 in Go Math! Textbook.
5. Culminating Activity/Summative Assessment is the Strip Pattern Project. Students are to create there own strip pattern on a grid paper. The design must have all 4 transformations represented and be in color. They will also have to show the transformations Algebraically and describe how the shapes change.

NAME _____ PERIOD _____ DATE _____

STRIP PATTERN
ALGEBRAIC REPRESENTATION

1. Write the coordinates of your pre-image.
2. Write the rule that is used for the transformation.
3. Write the coordinates of the image.
4. Written description of each transformation, using complete sentences.

TRANSLATION

VERTICES OF PRE-IMAGE	RULE	VERTICES OF IMAGE

DESCRIBE THE PROPERTIES OF THE TRANSLATION:

_____

_____

_____

REFLECTION

VERTICES OF PRE-IMAGE	RULE	VERTICES OF IMAGE

DESCRIBE THE PROPERTIES OF THE REFLECTION:

_____

_____

ROTATION (CHOOSE ONE POINT)

VERTICES OF PRE-IMAGE	RULE	VERTICES OF IMAGE
	90	
	180	
	270 / 90 cc	

DESCRIBE THE PROPERTIES OF THE ROTATION:

DILATION

VERTICES OF PRE-IMAGE	RULE	VERTICES OF IMAGE

DESCRIBE THE PROPERTIES OF THE DILATION:

STRIP PATTERN PERFORMANCE TASK DUE DATE: _____

1. Use the entire coordinate plane to make your own strip pattern.
2. Use at least 3 different shapes and all 4 transformations: translation, rotation, reflection, dilation.
3. Make sure to use a ruler or straight edge to make your shapes.
4. Label the pre-image and the image for each transformation using different sets of letters.
5. Neatly color your Strip pattern using several different colors. Make it look awesome!
6. Attach pictures of 3 different artifacts showing strip patterns from your own culture along with a written explanation of what it is and what culture it is from.

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STRIP PATTERN RUBRIC

	EXCEEDS (4)	PROFICIENT (3)	ALMOST PROFICIENT (2)	WELL BELOW (1)
STRIP PATTERN	• Accurately shows all four transformations. • Uses entire coordinate plane. • All labels clearly marked.	• Shows all four transformations. • Covers entire coordinate plane. • All labels marked. • May have 1-2 mistakes.	• Shows 3 transformations. • Covers most of the coordinate plane. • Most labels marked. • May have 2-3 mistakes.	• Shows 2 transformations, • Covers part of the coordinate plane. • Some labels marked. • Many mistakes.
DESIGN	• All lines/shapes are neatly drawn using a straight edge. • Neatly colored using more than 3 colors. • Uses more than 3 different shapes.	• Almost all lines/ shapes are neatly drawn using a straight edge. • Neatly colored using 3 colors. • Uses more than 3 different shapes.	• Most lines/shapes are drawn using a straight edge. • Colored using 2 colors. • Uses 2 different shapes.	• Uses only one/ no color. • Many shapes are made without a straight edge. • Uses only 1 shape.
DESCRIPTION	• Every transformation has a clear written description of what happens when figures are transformed and uses complete sentences. • Accurate algebraic representations of all 4 transformations.	• Every transformation has a written description of what happens when figures are transformed. • Algebraic representations of all 4 transformations.	• Transformations have a written description of what happens when figures are transformed. • Algebraic representations of at least 2-3 transformations.	• Some transformations have a written description of what happens when figures are transformed. • Algebraic representations of 1 transformation.
ETHNIC ARTIFACT	• Accurately shows all four transformations. • Uses entire coordinate plane. • All labels clearly marked.	• Accurately shows all four transformations. • Uses entire coordinate plane. • All labels clearly marked.	• Accurately shows all four transformations. • Uses entire coordinate plane. • All labels clearly marked.	• Accurately shows all four transformations. • Uses entire coordinate plane. • All labels clearly marked.
			TOTAL SCORE ___ / 16 YOUR SCORE ___ / 16	GRADE: _____ GRADE: _____

GRADING SCALE: 16 - 15 = A 14 - 13 = B 12 - 11 = C 10 = D 9 or less = F