



Standard Benchmarks and Values

Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software.

8.G.1: Verify experimentally the properties of rotations, reflections, and translations:

- a. Lines are taken to lines, and line segments to line segments of the same length.
- b. Angles are taken to angles of the same measure.
- c. Parallel lines are taken to parallel lines.

8.G.2: Understand that a two dimensional figure is congruent to another if the second

can be obtained from the first by a sequence of rotations, reflections, and translations, given two congruent figures, describe a sequence that exhibits the congruence between them.

8. G.3: Describe the effect of dilations, translations, rotations and reflections on two dimensional figures using coordinates.

8.G.4: Understand that a two dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them.

TRIBAL TATTOO TRANSFORMATIONS

Laura Farris

8th Grade (Adapted for Special Education Students)
1 Week (Three 90 minute periods)

Why is it important to learn more about the world around you?

- How could knowing about measuring tools and techniques help people to learn about cultural diversity?
- Are there ways that understanding tribal tattooing might help us learn and appreciate more about the world around us?
- Are there ways that understanding tribal tattooing might help students become more introspective about their own heritage and culture?

Enduring Understandings

Tribal tattoo designs represent deep cultural and religious meaning from around the globe. The designs are often drawn in black and involve certain symbols and characters from different continents. Most tribal

tattoo designs have represented tribal affiliations with specific meanings and beliefs. An excellent website explaining the significance of Hawaiian Tribal Tattoos is <http://www.mythichawaii.com/tribal-tattoos.htm>.

Critical Skills and Concepts

- Flipping a figure into a mirror image creates a reflection.
- Sliding a figure without turning or flipping creates a translation.
- Turning a figure a certain number of degrees creates a rotation.
- Enlarging or shrinking a figure creates dilation.

Authentic Performance Task

Create a personalized tribal tattoo using Hawaiian or Polynesian symbols. The student must be able to show and explain reflection, rotation, translation, symmetry and/or dilation in his/her pattern.

Authentic Audience

School community including other students, parents, teachers, and administration.

Other Evidence

Precursor skills: Arithmetic

Student must be able to:

- be able to identify basic two-dimensional regular and irregular shapes
- have knowledge about the Cartesian coordinate system
- have instruction on transformation movement (slides, turns, flips, and enlarging and reducing)

Learning Plan

Background:

For centuries, various arts of tattooing have graced the bodies and satisfied the souls of the aboriginal peoples of Oceania. The vast majority of what we know today about these ancient arts has been passed down through legends, songs, and ritual ceremonies. The roles, techniques and motifs of the arts of tatau, moko, and uhi have continued to exist for over 2,000 years. The oldest of these traditions is in Samoa, and the youngest is in Aotearoa/Te Waipounamu. Hawaiian tattoos are colorful and vibrant, yet they are symbolic and full of meaning. Some design elements that were common throughout Polynesia were linear geometric motifs, petroglyphs, and very basic pictographic representations of men, animals, birds or other man-made objects. Each of the geometric designs, including lines; triangles; circles and other polygonal

symbols had multiple meanings based on placement on the body, incorporation with other designs, and the person being tattooed. It was usually up to the master to determine what was appropriate for each person and to then explain the story to that person. In the olden days, you had to deserve tattoos of Hawaiian tradition on your body. While they were sported by most male warriors, some women were given the privilege of possessing Hawaiian tattoos because of their pivotal roles in the community. Apart from tribal designs, environmental and natural styles became synonymous with Hawaiian tattoos. Examples of colorful tattoos of Hawaiian imageries include depictions of exotic flowers, turtles, arrows, sharks, lizards and dolphins.

(As referenced by numerous authors at www.pbs.org/skinstories/culture/)

Preparation

1. Introduce Tribal Tattoo culture with <http://www.mythichawaii.com/tribal-tattoos.htm> or the above aforementioned website. (There are other good websites also). Have student discussion concerning the information and importance of symbols in their own culture.
2. Have students reflect and fill out “**Tribal Tattoos Survey: How Would I Represent Myself?**” worksheet.

Plan

1. Students design, construct, share, and explain movements of their chosen tattoo (*uhi*) designs using the terms rotation, transformation, reflection and dilation.
2. Have students choose two or three Hawaiian or Polynesian designs to combine to make a tattoo design. Encourage students to find the meaning of the tattoo designs and relate it to their own life or experiences.
3. Give students overhead film sheets. Using black permanent markers have students explore how designs may be transformed with above actions and trace the symbols on the overhead projector sheet. As shapes are moved have students explain to partner or adult what type of move (rotation, transformation, reflection and dilation) has been performed. (Note: a copier could be used to create dilations).
4. When student are pleased with their tattoo creation put on the copier (with white paper behind) to make a permanent black/white product. Have students perform for others and explain design and movement of shapes to others.
5. Review rubrics for papers and presentations. Draft, revise and finalize to make more accurate.

Extension

After students have created their design have them superimpose the design on an X/Y coordinate graph and record rotation, transformation, reflection and dilation movements using approximate ordered pairs to track a certain point in the design as movements are made.

Examples: See the Power Point slides to reference 8th grade student illustrations.

Appendices A, B, and C show Tattoo Patterns, Assessment for Critical Skills and Concepts and Scoring Rubric.

Name: _____

Date: _____

Tribal Tattoos Survey: How Would I Represent Myself?

What are some important places for you? What symbols represent these places?

What are your favorite hobbies / activities? What symbols represent these activities?

What is an animal that represents you? Why?

What else is important to you and should be represented in your personal tattoo?

What color best represents you?

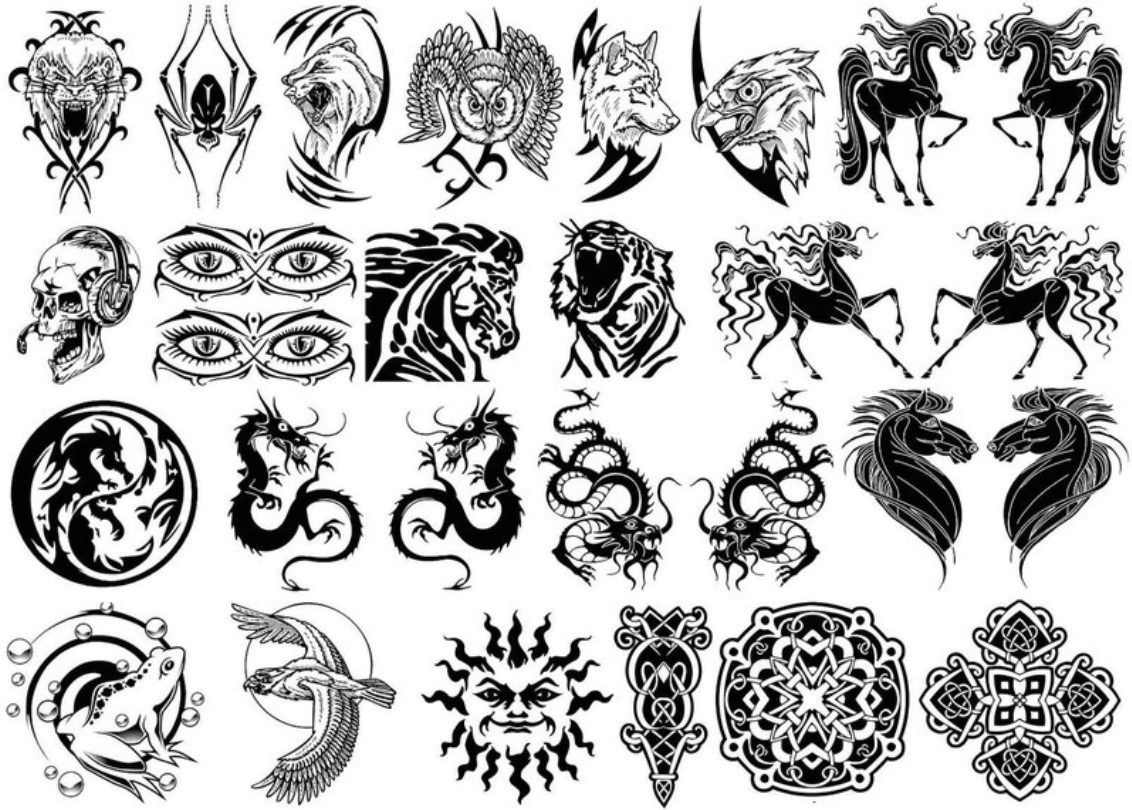
Ideas for a Personal Motto.

Tattoo Designs

APPENDIX A



APPENDIX A



Assessment for Critical Skills and Concepts

APPENDIX B

Standard Benchmarks	Skills	Concepts	Assessment
<p>8.G.1 Geometry -Verify experimentally the properties of rotations, reflections, and translations:</p> <p>a. Lines are taken to lines, and line segments to line segments of the same length.</p> <p>b. Angles are taken to angles of the same measure.</p> <p>c. Parallel lines are taken to parallel lines.</p>	<ul style="list-style-type: none"> • Determining reasonable accuracy • Understanding of translation, rotation, reflection, and dilation • Be able to explain 	<ul style="list-style-type: none"> • Attention to detail • Accuracy of calculations • Understanding of history and tattoo culture 	Formative feedback from peers and teachers during transformations
<p>8.G.2: Geometry - Understand that a two dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations, given two congruent figures, describe a sequence that exhibits the congruence between them.</p>	<ul style="list-style-type: none"> • Visual / spatial development • Appropriate use of technology • Fine motor skills 	<ul style="list-style-type: none"> • Attention to detail • Neatness 	<ul style="list-style-type: none"> • Formative feedback • Accuracy of drawing • Transformation drawing project rubric
<p>8.G.3 Geometry - Describe the effect of dilations, translations, rotations and reflections on two dimensional figures using coordinates.</p>	<ul style="list-style-type: none"> • Oral presentation • Listening to others • Understanding transformations • Generalizing results into sentences • Inferencing results and being able to compare to others' results 	<ul style="list-style-type: none"> • Understanding of geometric transformations • Collaborative discussion 	<ul style="list-style-type: none"> • Formative feedback during discussion of all projects • Communication skills
<p>8.G.4 Geometry - Understand that a two dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them.</p>	<ul style="list-style-type: none"> • Oral presentation • Listening to others • Understanding transformations • Generalizing results into sentences • Inferencing results and being able to compare to others' results • Revising to create quality products that accurately display information 	<ul style="list-style-type: none"> • Understanding of geometric transformations • Attention to detail • Neatness 	<ul style="list-style-type: none"> • Formative feedback during discussion of all projects • Accuracy of drawing • Transformation drawing project rubric • Communication skills

APPENDIX C

Rubric for Tattoo Transformations

4	3	2	1
Demonstrates a thorough understanding of translation, reflection, rotation, and dilation.	Demonstrates an understanding of translation, reflection, rotation, and dilation.	Demonstrates a partial understanding of translation, reflection, rotation, and dilation.	Demonstrates little understanding of translation, reflection, rotation, and dilation.
Well organized with authentic designs and there is acute attention to neatness.	Organized and most designs are authentic and there is attention to neatness.	Organization and neatness needs to improve and there are some authentic designs.	Very weak evidence of organization, authentic designs, and neatness.
Mathematical terms and symbols are used appropriately and are often elaborated upon.	Mathematical terms and symbols are used appropriately.	Some mathematical terms and symbols are used correctly.	Mathematical terms and symbol use are weak, not enough references to mathematical terms are used.
Thorough analysis and creativity of the problem with accurate solutions.	Analysis of the problem and creativity is evident, considerable accuracy.	Analyzes the problem with some success and creativity, accuracy needs to improve.	Very little evidence of analysis. Some educated guesses. Accuracy and creativity is weak.

