

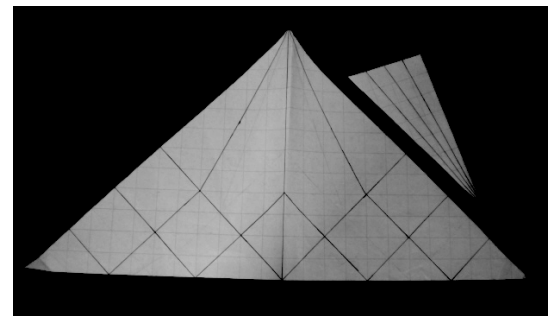
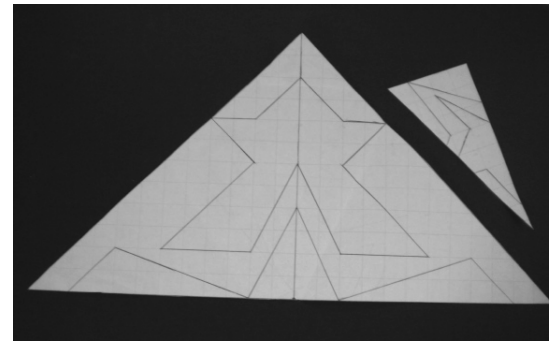
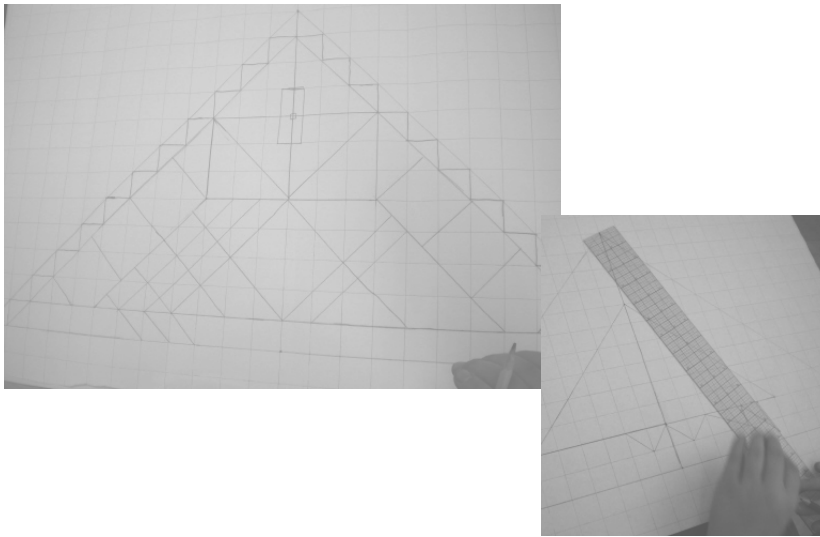
ARTS IMPACT—ARTS-INFUSED INSTITUTE LESSON PLAN (YR2-MAP)

SEVENTH GRADE—LESSON TWO: Kites: Patterns and Surface Decoration:

Enlarging Scale Part II

Artist-Mentor – Meredith Essex

Grade Level: 7th



Enduring Understanding

Application of knowledge of ratio, scale factor and proportion can be used to accurately enlarge the scale of shapes used in design and construction.

Art and Math

Target: Enlarges design for surface.

Criteria: Multiplies design shapes by scale factor and plots the vertices of proportional similar figures on one-inch grid paper (kite sail and keel pattern).

Art and Math

Target: Uses craftsmanship in drawing pattern and surface design.

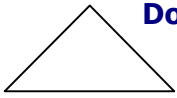
Criteria: Draws clean lines with straightedge and/or compass (optional) aligned with grid lines and vertices on one-inch grid paper.

Materials

Small and large rulers, pencils, erasers, scissors, My Kite Journal (MKJ), 2-gallon zipper (ex: Ziploc) bags

Learning Targets

- Enlarges design for surface.
- Uses craftsmanship in drawing pattern and surface design.

**Do Now**

Draw a triangle or rectangle. Enlarge it (draw a similar figure). Name scale factor.

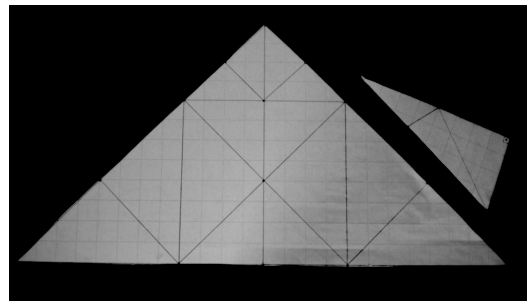
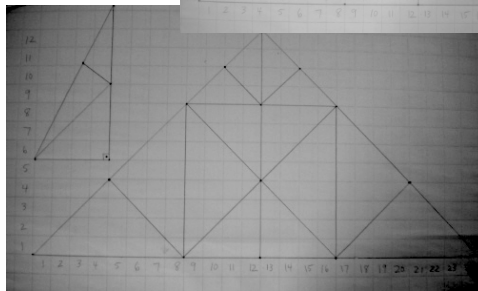
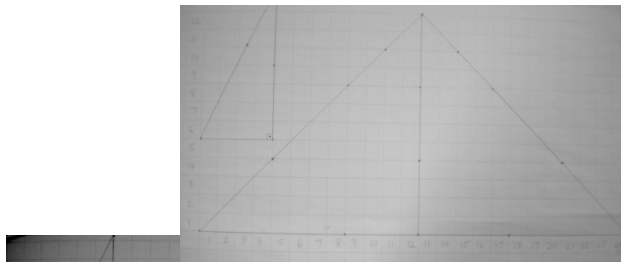
MKJ 8-6

Activities/Prompts

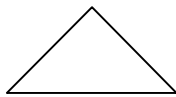
- What does craftsmanship mean? What role does math play in craftsmanship? We are going to be enlarging and transferring our symmetrical geometric designs for our kite.
- Look closely at your small scale artistic design for sail and keel. How many times will you be multiplying the sides of each figure in your design to make proportional similar figures? (scale factor is 4)
- Study your small scale design and dot the vertices of enlarged similar figures on your full size kite pattern.
- Draw lines in between vertices for the sides of the figures of your enlarged surface design; again, anchor and use your ruler for every line that you draw.
- Cut out your full size kite sail and keel pattern. Open scissors wide and cut smooth just outside the lines (so you can still see them). Fold your sail on the line of symmetry to confirm correct counting/measurement. Use craftsmanship! Be sure to write your name on both triangles.

Big Math and Art Ideas

Ratio and proportion, scalene right triangle, isosceles triangle, scale factor, symmetry, polygons, similar figures, balance, contrast, complementary colors.

**Closure /Self Assessment**

Students complete self- checklist and reflect: *Why does an artist, craftsman or designer make a small design first before enlarging it to its full size?*
MKJ 8-7



All drawings and MKJ are returned to zipper bag.

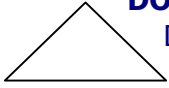
Assessment Criteria

- Multiplies design shapes by scale factor and plots the vertices of proportional similar figures on one-inch grid paper (kite sail and keel pattern).
- Draws clean lines with straightedge and/or compass (optional) aligned with grid lines and vertices on one-inch grid paper.

Next Steps/Follow up Needs Gather paper clips and ball point pens; cut graphite transfer paper and Tyvek rectangles diagonally to accommodate two full size kite patterns (sail and keel).

Teaching and Learning Strategies

DO NOW WARM-UP



Draw a triangle or rectangle

Enlarge it (draw a similar figure). Name scale factor. MKJ 8-6

1. Engages students in discussion focused on the role of math in craftsmanship. *Prompts: What does "craftsmanship" mean? What role does math play in craftsmanship? We are going to be enlarging and transferring our symmetrical geometric designs for our kite. Craftsmanship means accuracy, care, building things that don't fall apart: how do we use art and math skills to do that? Measuring accurately, drawing with a ruler, cutting precisely, etc.*

Student: Discusses craftsmanship.

2. Demonstrates accurately drawing surface decoration on kite sail and keel pattern. *Prompts: Look closely at your small scale artistic design for sail and keel. How many times will you be multiplying the sides of each figure in your design to make proportional similar figures? (scale factor is 4) Notice that I am plotting the vertices by drawing dots for vertices of each similar figure and then plotting the same figure in reflection on the other side of my line of symmetry.*

Student: Multiplies small scale design figures by scale factor and draws vertices for figures on one-inch grid for similar figures in reflection; checks measurements, counting, and location of vertices on grid with another student or teacher.

Embedded Assessment: Criteria-based check for accuracy with peer or teacher

3. Demonstrates accurately drawing lines vertex to vertex for figures in reflection for surface design. *Prompts: Remember that your eyes, as well as your measuring tools, can identify accurate enlargement. Study your small scale design and draw the sides for the figures of your enlarged surface design; again, anchor and use your straightedge for every line that you draw.*

Student: Draws sides by connecting vertices and arcs for similar figures in reflection using craftsmanship.

Embedded Assessment: Criteria-based teacher checklist

4. Demonstrates craftsmanship in cutting out sail and keel pattern shapes. *Prompts: Cut just outside the line so you can still see it. Open the scissors all the way and make long, smooth cuts. Write your name on both triangles.*

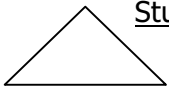
Student: Cuts out both triangle pattern pieces.

Embedded Assessment: Criteria-based teacher checklist

5. Guides Student self assessment and reflection. *Prompts: Why does an artist, craftsman or designer make a small design first before enlarging it to its full size?*

Student: Completes self assessment checklist and reflects. MKJ 8-7

Embedded Assessment: Criteria-based teacher checklist



Vocabulary	Materials and Community Resources	WA Essential Learnings & Frameworks
<p><u>Arts Infused:</u> Enlarge Geometric shape Pattern Proportion Scale Symmetry Triangle</p> <p><u>Math:</u> Angle Base Height Isosceles triangle Ratio Reflection Scale factor Scalene triangle Side Similar figures Vertex Vertices</p> <p><u>Arts</u> Abstract Balance Complementary Colors Contrast</p> <p><u>Kite</u> Base Keel Sail</p>	<p>Museum Artworks Tacoma Art Museum Collections: Scott Fife, <i>LeRoy the Big Pup</i>, 2004</p> <p>Additional Resources: <i>The Making of Japanese Kites: Tradition, Beauty and Creation</i> by Masaaki Modegi, Japan Publications Trading Co., 2007 www.drachen.org</p> <p><i>Kites for Everyone: How to Make and Fly Them</i> by Margaret Gregor, Dover Books, 2000</p> <p>Delta Kite Design Formula by Tony Cyphert</p> <p>Art Materials: My Kite Journal Pencils Vinyl erasers Scissors Small and large rulers</p> <p>Optional: Protractor Compass</p>	<p>Arts State Grade Level Expectations</p> <p>AEL 1.1 concepts <i>Geometric shape</i> <i>Scale</i></p> <p>AEL 1.1.2 composition <i>Proportion,</i> <i>Symmetry/balance</i></p> <p>AEL 1.2 skills and techniques <i>Measuring</i> <i>Drawing</i> <i>Enlarging</i></p> <p>AEL 4.2 connections between the arts and other content areas <i>Explains relationships between the arts and other content areas</i></p> <p>Math State Grade Level Expectations</p> <p>7.2.B proportionality and similarity <i>Solves single- and multi-step problems involving proportional relationships and verifies the solutions</i></p> <p>7.2.C proportionality and similarity <i>Describes proportional relationships in similar figures and solve problems involving similar figures</i></p> <p>7.2.D proportionality and similarity <i>Makes scale drawings and solves problems related to scale</i></p> <p>7.2.H proportionality and similarity <i>Determines whether or not a relationship is proportional and explains reasoning</i></p> <p>7.2.I proportionality and similarity <i>Solves single- and multi-step problems involving conversions within or between measurement systems and verifies the solutions</i></p>

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SEVENTH GRADE—LESSON TWO: Kites: Patterns and Surface Decoration:
Enlarging Scale Part II
ASSESSMENT WORKSHEET

Disciplines	ART AND MATH				Total 4 Points
	Ratio: Proportion		2-D Shapes and Patterns		
Concept					
Students	Multiplies design shapes by scale factor	Plots the vertices of proportional similar figures	Draws clean lines with straightedge and/or compass	Aligns with grid lines and vertices	
1.					
2.					
3.					
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28.					
Total					
Percentage					

Criteria-based Reflection Questions: (Note examples of student reflections on back.)
Why does an artist, craftsman or designer make a small design first before enlarging it to its full size?

Thoughts about Learning:
Which prompts best communicated concepts? Which lesson dynamics helped or hindered learning?

Lesson Logistics:
Which classroom management techniques supported learning?

Teacher: _____ Date: _____