

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

LESSON TITLE: Transformations: Architectural Elevations

Visual Art and Math Lesson

Artist-Mentor – Meredith Essex

Grade Level: Fourth Grade



Enduring Understanding

Repetition of geometric shapes, lines, and transformations (reflections and translations) can be found in and used for elements in architectural design.

Geometry Search Journal

Target: Identifies geometric shapes, lines, and transformations in architecture.

Criteria: Draws, labels, and describes properties/attributes of polygons, parallel and perpendicular lines, congruence, reflections, and/or translations seen in buildings.

Target: Uses transformations of polygons in elevation collage.

Criteria: Locates multi-sided straight-sided shapes in reflection/flip and translation/slide in view of a building side.

Target: Represents architectural elements in collage.

Criteria: Includes windows, doors, railing/ porch, ornamentation, steps, lights, trim, and/or roof using layers of paper.

Target: Uses craftsmanship in collage.

Criteria: Cuts clean edges and attaches paper shapes smoothly, fully flat on background paper.

Teaching and Learning Strategies

Introduction to Arts-Infused Concepts through Classroom Activities:

Arts-Infused Concepts: Shape; Balance; Polygons; Parallel and Perpendicular Lines; Symmetry/ Reflections and Translations.

- Go on a school walk and notice the sides of buildings. What shapes/figures are used and how they are similar or different? Find a flip—find a slide.
- Find and record polygons in symmetry in the classroom environment and buildings.
- Practice drawing symmetrical buildings using only polygons.

1. **Introduces plans and photos from *Tacoma in Style* and Tacoma Art Museum, designed by Antoine Predock, as well as photos of regional buildings:** *Prompt: This is a lesson that is a*

visual art lesson and a math lesson at the same time. Architects are artists who design buildings. Geometric shapes, lines and transformations are used in design of architecture.

Student: Views resources.

2. Facilitates identification of geometric shapes, lines, and transformations

(reflections/flips and translations/slides) in buildings. *Prompts: Remember when we designed an entry for a building—now we are making a design for an elevation (side of a building). This time you have the option of making the whole elevation design symmetrical OR you can use symmetry in design of parts of the building--perhaps just the entry, garage, or windows are symmetrical. We are warming up with the same exercise we used before to help us find the geometry in architecture. Everyone needs to partner with the student next to them and look closely at an image of a building (or one outside the window). Silently each of you needs to find, draw and label, in your Geometry Search Journal, polygons, congruent shapes, parallel and perpendicular lines, and examples of transformations: reflections/flips and translations/slides). This is a 5 minute exercise. When you have finished, share your findings with your partner and see if they are consistent.*

Student: Analyzes architecture and records findings in geometry search journal

Embedded Assessment: Criteria-based peer critique; criteria-based teacher checklist

3. Demonstrates conceptualizing and starting an elevation collage. *Prompts: When an architect designs a building it is a 2-D plan for a 3-D structure. An elevation is a 2-D representation of one side of a building. An architect's design shows a building from multiple points of view: elevations, from each compass direction (north, south, east, and west) as well as a bird's-eye view from above. . . We are going to create a design for a building elevation in collage. I imagine a fabulous building in my mind. . . .I am going to describe it to someone at my table or do a quick sketch of it. I am making a modern building with a steep angular roof and I am selecting paper and cutting building shapes which I think will work for this.*

Student: Observes demonstration.

4. Demonstrates arranging big collage shapes and layering additional shapes based on idea or sketch.

Prompts: With attention to filling the whole background paper, I am arranging my basic building shapes. Next, I am starting to cut out shapes from the small papers to represent architectural details. What will my building need? (windows, doors, railing, porch, ornamentation, roof, steps, lights, trim). I might even use lines or shapes in paper to suggest a surface pattern: boards, bricks, tiles, stones. Note that these small square and rectangular papers can easily be cut in half or quarters to create triangles or rectangles. Our math criteria include using slides and flips in our elevation. We will need congruent shapes to do this: what is the easiest way to create multiples: yes-- cut through layers of paper; fold, then cut, then cut along the fold....Also, when I cut geometric shapes from the paper provided, I always return a usable piece of scrap paper (also left in a geometric shape that is a square or rectangle) to the paper container. This extends the life of high quality papers. Notice how I am checking for polygons, reflections and translations as I layer shapes.

Student: Observes cutting and paper management techniques.

5. Demonstrates gluing techniques. *I have checked for translations and reflections of shapes in my elevation. Notice my use of craftsmanship in using precise gluing techniques by applying the glue stick along the edges of the reverse side of papers for smooth, flat adhesion. Do you see any edges that do not meet the background paper? Guides students in developing collage building elevation.*

Prompts: As you begin, what combination of shapes will you use for the basic form of your building? How would you describe the building we are occupying? How would you describe the buildings you see outside our windows? They might influence your design. Visualize and draw or describe your building to a peer. Cut out and arrange the basic shapes, filling the background paper. Cut out, and arrange

details of windows, doors, railing porch, ornamentation, steps, lights, trim. Check for reflections and translations. When you are ready to glue, raise your hand and show where a shape makes a translation/slides, a reflection/flips, and name some of the polygons you are using.

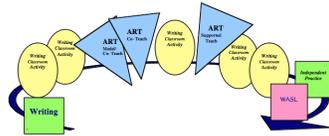
Student: Conceptualizes, cuts out, arranges, analyzes, assesses and glues collage of building.

Embedded Assessment: Criteria-based teacher checklist

6. Facilitates criteria-based reflection. Collages are displayed on the board. *Prompts: Point out and name polygons that you see in a peer's art. Find an example of a translation/slide or a reflection/flip in a peer's art. Note the artist and describe where you see it in your Geometry Search Journal. Describe a technique that you used to cut precise congruent shapes. What were some of the challenges of collage craftsmanship that you encountered?*

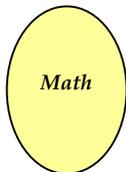
Student: Participates in critique.

Embedded Assessment: Criteria-based class critique

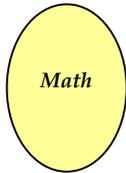


After VISUAL ART lesson and before INDEPENDENT PRACTICE:

Math Centers



1. Arranges blocks into a building and draws from multiple points of view noting translations/slides and reflections/flips in each elevation.



2. Makes a rough draft elevation design for a fort, tree house, or home for a pet using a ruler and protractor.

Independent Practice: Slide to make a Translation! Flip to make a Reflection!

Vocabulary	Materials and Community Resource	WA Essential Learnings & Frameworks
<p><u>Arts-Infused:</u> geometric shape symmetry 2-D 3-D</p> <p><u>Visual Art:</u> architecture collage elevation</p> <p><u>Math:</u> congruent flip parallel perpendicular polygon reflection slide transformation translation</p>	<p>Museum Artworks: Tacoma Art Museum building plans: Andre’ Predock <i>Tacoma in Style</i>: published by the City of Tacoma</p> <p>Art Materials: Geometry Search Journal</p> <p>2x2, 3x4, 4x6, 6x8 rectangles and squares of neutral cardstock for large building shapes</p> <p>small strips, squares and rectangles of neutral, patterned/ textured papers for details scissors</p> <p>8 1/2x 11 neutral colors of cardstock for background</p> <p>glue sticks scratch paper/glue books</p>	<p><i>AEL 1.1 concepts</i>: line, shape; 2-D, 3-D <i>AEL1.1.2 principles of organization</i>: balance <i>AEL 1.2 skills and techniques</i>: collage <i>AEL 4.2 connections between arts and other content areas</i>: geometry: translations; reflections</p> <p><i>MEL 1.3.4 geometric sense</i>: understands and applies single transformations using a translation (slide) or reflection (flip)</p> <p>Math State Frameworks <i>Grade 3</i>: describes and compares congruent 2D figures; draws a shape that is congruent to a given 2D shape <i>Grade 4</i>: solves problems involving congruence (creates a design made out of congruent shapes, simulates translations and reflections using objects; records results of a translation (slide) or reflection (flip), creates designs using translations (slides) or reflections (flips) <i>Grade 5</i>: draws congruent figures and shapes in multiple orientations using a transformation</p>

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

LESSON TITLE: Transformations: Architectural Elevations

ASSESSMENT WORKSHEET

Students	VISUAL ART/MATH Shape/ Line/ Symmetry	VISUAL ART/MATH Shape/Symmetry/Repetition		ART Architecture	ART Craftsmanship		Total 6
	Draws, labels, and describes properties/attributes of polygons, parallel and perpendicular lines, congruence, reflection, and/or translation seen in buildings	Locates multi-sided shapes/figures in <u>reflection</u> in view of a building side	Locates multi-sided shapes/figures in <u>translation</u> in view of a building side	Includes windows, doors, railing/ porch, ornamentation, steps, lights, trim, and/or roof	Cuts clean edges	Attaches paper shapes firmly and smoothly to background paper	
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							
17.							
18.							
19.							
20.							
21.							
22.							
23.							
24.							
25.							
26.							
27.							
28.							
Total							
Percentage							

Criteria-based Reflection Questions: (Note examples of student reflections.)

Self-Reflection: Describe a technique that you used to cut precise congruent shapes. What were some of the challenges of collage craftsmanship that you encountered?

Peer to Peer: Point out and name polygons that you see in a peer's art. Find an example of a translation/slide or a reflection/flip in a peer's art. Note the artist and describe where you see it in your Geometry Search Journal. Visualize and draw or describe your building to a peer.

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: _____

ARTS IMPACT—ARTS-INFUSED LEARNING FAMILY LETTER

VISUAL ART AND MATH LESSON – Transformations—Architectural Elevations

Dear Family:

Your child participated in a **visual art and math** lesson.

- We looked at regional **architecture** and identified examples of math concepts (**reflections**/flips and **translations**/slides) in the buildings we saw. We found **parallel** and **perpendicular lines, symmetry,** and **polygons** (straight-sided shapes).
- We came up with an idea for a **building elevation** (a side of a building) through drawing or talking with a peer.
- We created a building elevation **collage**. We selected and cut out shapes to represent our basic building form and then cut out additional paper shapes to create architectural elements: doors, windows, trim, steps, lights, railing.
- We included **geometric transformations** in our collage elevations: shapes that flip (reflections) and slide (translations) in location.
- We used **craftsmanship** in collage through precise cutting and gluing shapes smoothly to paper.

At home you could analyze the architecture of your home. You could look for different ways that lines and shapes are combined in other buildings in your neighborhood.

Enduring Understanding

Repetition of geometric shapes, lines, and transformations (reflections and translations) can be found in and used for elements in architectural design.