Grade 5 Math Enrichment - Unit 2 - Geometry and Art

Unit Focus

Throughout this unit, students will be exploring and analyzing how math and art work together. From creating balanced Calder mobiles to incorporating inspirational artwork when building their own platonic solid, students will see the significance between the mathematical connection to famous art.

Stage 1: Desired Results - Key Understandings

Standard(s)

Common Core

Mathematics: 5

- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. (CCSS.MATH.CONTENT.5.OA.A.1)
- Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation add 8 and 7, then multiply by 2 as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product. (CCSS.MATH.CONTENT.5.OA.A.2)
- Reason abstractly and quantitatively. (CCSS.MATH.MP.2)
- Attend to precision. (CCSS.MATH.MP.6)

Mathematics: 6

- Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. (CCSS.MATH.CONTENT.6.G.A.1)

Mathematics: 7

- Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. (CCSS.MATH.CONTENT.7.G.B.4)

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- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)

Transfer

Students will be able to independently use their learning to...

T1 Initiate a plan using a variety of methods/strategies appropriately, execute it, and evaluate the reasonableness and accuracy of the solution.
T2 Identify and generalize patterns and structure in numbers, expressions, data and objects.
T3 Understand shapes and spatial relationships.

Meaning

Understanding(s)

Students will understand that...

U1 Mathematicians apply transformations and/or use symmetry to analyze mathematical situations and solve problems.
U2 Mathematicians analyze characteristics and properties of geometric shapes to develop mathematical arguments about geometric relationships.
U3 Mathematicians use geometric models, and spatial sense to interpret and make sense of the physical environment.
U4 Mathematicians can describe patterns, relations, and/or functions to access strategies to solve problems.

Essential Question(s)

Students will keep considering...

Q1 How do math and art come together?
Q2 What do you see?

Acquisition of Knowledge and Skill

Knowledge

Students will know...

K1 Vocabulary: transformations, slide, reflection, rotation, tessellations, symmetry, area, circumference, radius, diameter, pi, fulcrum, vertex

Skill(s)

Students will be skilled at...

S1 Student will be able to find area of an irregular shape.
S2 Students will be able to calculate distances and weights to balance a seesaw.

Stage 1: Desired Results - Key Understandings		
• Design: Engaging in a process to refine a product for an intended audience and purpose. (POG.2.2)	**K2** Concept of area and/or formulas of different types of polygons **K3** Understanding the concept of equivalency of two expressions. **K4** Conceptual understanding of the distributive property as it relates to physical objects (seesaws).	**S3** Students will be able to perform two or more transformations (especially rotations and reflections) to create a tessellation.