

Jamesburg Public School

Grace W. Breckwedel Middle School

MATH and ART INTEGRATION

Lesson 1

Teacher: Ellen Blashkovsky

OBJECTIVE:

Student will: 1) increase understanding of transformations; 2) learn about the artist M.C. Escher; 3) utilize mechanical and creative skills to make a tessellation

Common Core State Standards:

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

CCSS. Math. Content.8.G.A.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.

MATERIALS:

Various works by M.C. Escher
3" x 3" squares from card stock
Plain white paper
Scissors/tape/markers

PROCEDURE:

Prior lessons on transformations, specifically translations, can conclude with this extension activity.

1. Show students various works of Escher's which contain tessellations and discuss the transformation (i.e. translations) that occur in his work
2. Discuss tessellations in detail (attached example)
3. Have students create their own tessellation as per attached instruction sheet

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Lesson 2

Teacher: Ellen Blashkovsky

OBJECTIVE:

Student will: 1) increase their understanding of a ratio; 2) learn about the Golden Ratio and its connection to both math and art; 3) improve their measuring skills

Common Core State Standards:

CCSS. Math. Content.6.RP.A.3b Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

CCSS. Math.Content.6. RP.A.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

MATERIALS:

Worksheets as per attached Rulers
Various works of art displaying the Golden Rectangle

PROCEDURE:

Prior lessons on ratios can conclude with this extension activity.

1. Discuss what the Golden Ratio is and how it is like Pi (π) in that it is an irrational number that is represented by a Greek letter, Phi (ϕ), and equals approximately 1.618
2. Have students fill out worksheets (see attached) which involve the measurement of length to width in both faces as in the Mona Lisa and in various rectangles. Discuss how this ratio is pleasing to the human eye and what this means in terms of beauty in people, art, architecture, etc.
3. Relate the Fibonacci sequence to the Golden Ratio (i.e. as you move along the sequence and take the ratio of consecutive numbers in the sequence, the result gets closer to 1.618). That this sequence occurs in nature (i.e. how certain plants grow such as pinecones and pineapples) makes it even more interesting and mysterious.