Mosaics & Symmetry

Summary

This lesson introduces students to the symmetries of Reflection, Rotation, Translation, and Glide through mosaics. It is a good precursor to tessellations.

Time Frame

2 class periods of 45 minutes each

Group Size

Pairs

Life Skills

Aesthetics, Thinking & Reasoning, Communication

Materials

Here is a link to a video pattern lesson that illustrates the use of pattern in art and nature. http://www.linkslearning.org/Kids/1_Math/2_Illustrated_Lessons/5_Patterns/index.html 2cm graph paper scissors colored paper or tessarae like pieces of plastic, tile, candy, etc. glue stick

Background for Teachers

Describe and show examples of Symmetry in Art, Nature, and Math. Show examples of Mosaics Define Reflection Symmetry: An image is reflected as through a "mirror line". Rotation Symmetry: an image is repeated as it rotates around a center point. 4 times is a 90 degree rotation and 8 times is a 45 degree rotation. Translation Symmetry: Repetition of a design along a line. Glide Symmetry: a combination of reflection and the line symmetry. Note how that if there is a glide there is a translation but not the other way around.

Student Prior Knowledge

simple Fractions simple percentages patterns degrees and rotation

Intended Learning Outcomes

Prior to learning about Tessellations, student should be able to recognize these four symmetries and attempt to use them in mosaics.

Instructional Procedures

After showing examples from the internet, students should attempt to glue to a graph paper colored squares that demonstrate the use of the various symmetries in series of 4x4 patterned squares. Note: that all symmetries work best if the the original 4x4 pattern is asymmetrical. After completing at least 16 identical asymmetrical patterns squares, the students should be able to align them into the basic symmetries. Additionally, students can use 100 of the 2cm graph squares to create a design using various colored pieces. After counting the number of pieces of each color used, student can project percentages of color used.

Strategies for Diverse Learners

Struggling students can be given a pre colored 4x4 to lay the pieces over and glue down. Working with fewer possible color combinations will help to simplify the process.

Extensions

see tessellations.

Assessment Plan

Have students share their patterns with a partner and try to identify the core pattern. For example: in the translations symmetry a student can use an ABBCCDE core and repeat it three times to be identified by his/her partner.

Bibliography

100 piece Mosaic: Internet Symmetry: Internet

Authors

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