

MATHEMATICAL MONKEY MAT

Basic Description:

This whimsical mat that is the setting for the Polyhedral Puzzle Plaza provides a large-scale view of symmetry and tessellation.

Objectives:

At this exhibit, students can identify the points of symmetry in the mat and learn about different types of symmetry.

Links to Websites:

<http://mathmidway.org/Training/monkey.php>

<http://www.learner.org/courses/mathilluminated/interactives/index.php#symm>

<http://www.teachersnetwork.org/dcs/math/symmetry/>

<http://www.tessellations.org/diy-basic1.htm>

Vocabulary:

Axis of symmetry

Hexagon

Point symmetry

Rhombus

Rotational symmetry

Tessellation

Transformation

Dilation

Line symmetry

Reflection

Rotation

Six-fold symmetry

Three-fold symmetry

Two-fold symmetry

Before:

- ⊙ (Level 1, 2, 3) Visit the Math Midway's training video for the Mathematical Monkey Mat: <http://mathmidway.org/Training/monkey.php>

- ⊙ (Level 1, 2, 3) Learn or review the different types of symmetry by linking to: <http://www.learner.org/courses/mathilluminated/interactives/index.php#symm> and <http://www.teachersnetwork.org/dcs/math/symmetry/>

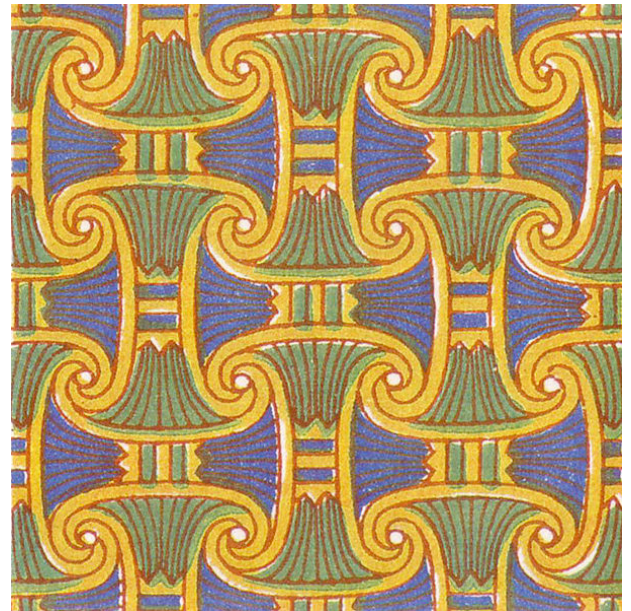
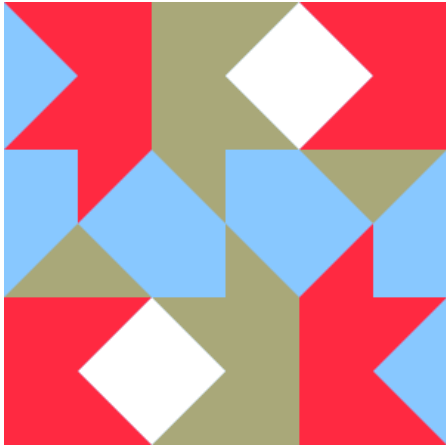
- ⊙ (Levels 2, 3) Study other images to identify points of symmetry. Search the room or the internet.

What type of symmetry do these objects have?

If it (they) exist, can you draw the line(s) of symmetry?

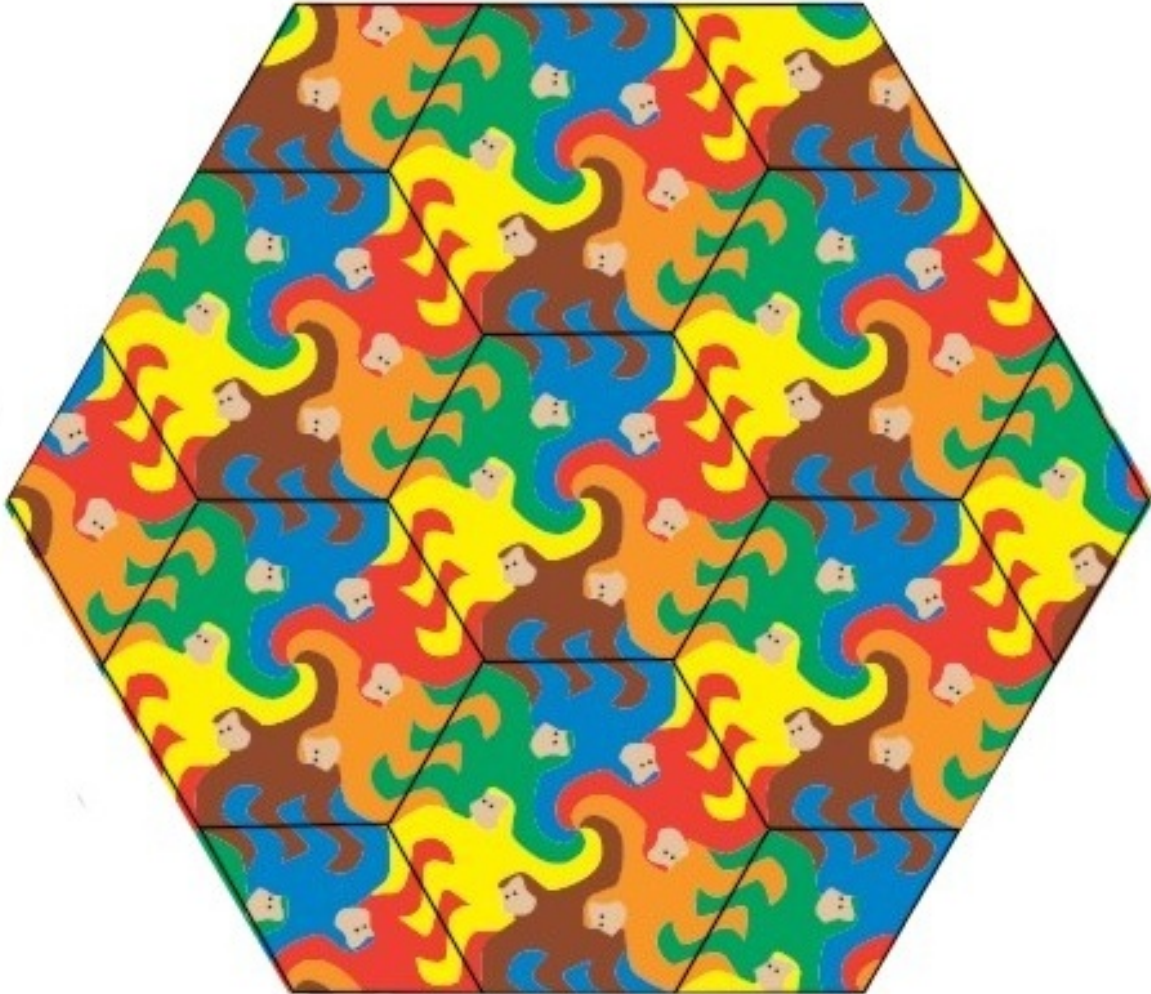
Locate the points of symmetry?

Determine the angle through which the object must be rotated in order to view the identical image?



During:

- ⊙ (Level 1, 2, 3) Look at the monkey mat and identify the points where the rotational symmetry is 2-fold, 3-fold, and 6-fold.



Answers:

2-fold symmetry point is where the ankles of the shorter legs touch,

3-fold symmetry point is where monkey elbows join,

6-fold symmetry point is where all the upturned arms meet

After:

- ⊙ (Level 1, 2, 3) Create your own tessellation pattern on paper. A great interactive online tutorial is available here: <http://www.tessellations.org/diy-basic1.htm>
- ⊙ (Level 2, 3) Use Geometer's Sketchpad to create your own tessellations.
- ⊙ (Level 2, 3) Investigations: examine MC Escher's work.