Transformation Shuffle

Presented by

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Assessed Curriculum

Reporting Category Geometry and Spatial Reasoning

Readiness Standard Grade 4

4.9B use translations, reflections, and rotations to verify that two shapes are congruent
Assessed Curriculum

Reporting Category Geometry and Spatial Reasoning

Supporting Standard Grade 3
3.9A Identify congruent two-dimensional figures
3.9C Identify lines of symmetry in two-dimensional geometric figures

Supporting Standard Grade 5
5.8B Identify the transformations that generates one figure from the other when given two congruent figures on a Quadrant 1 coordinate grid
Processed Standards

14.D Use tools such as real objects, manipulatives, and technology to solve problems
16.A Make generalizations from patterns or set of examples and non-examples
16.B Justify why an answer is reasonable and explain the solution process
Translation

In a translation transformation all the points in the object are moved in a straight line in the same direction. The size, the shape and the orientation of the image are the same as that of the original object. Same orientation means that the object and image are facing the same direction.
Reflection

A **transformation** in which a **geometric figure** is **reflected** across a **line**, creating a mirror image.
Rotation

A **rotation** is a transformation that **turns a figure** about a **fixed point**.
Identify transformations displayed
Rotational Symmetry

A figure has **rotational symmetry** when it can be rotated around a central point, or point of rotation less than 360 and still be identical to the original figure.

A picture has **rotational symmetry if you can turn it and it looks the same**. (It doesn't count if you turn it in a complete circle - everything looks the same then!)
Let’s test for rotational symmetry
Activity 1

Different logos and designs

- Whole group with a box
- Small group "Turn It Around"
- Extension-students find company logos with rotational symmetry
Polyominoes are shapes formed by connecting equal-sized squares, each joined together with at least one other square along an edge.

The shape of a polyomino can grow quite complex when there are many squares.

A domino has two squares.

Then come trominoes (3 squares)
- tetrominoes (4)
- pentominoes (5)
- hexominoes (6)
- heptominoes (7)
Advantages of Using Polyominoes

Polyominoes develops an environment that includes:

- intriguing puzzles,
- interesting patterns
- exciting games
- applications for using transformations
- applications of area and perimeter
- exercises in critical thinking and spatial reasoning
- nurture a non-anxious and positive attitude toward math
- promote an atmosphere of cooperation
Tetrominoes (4 squares using color tiles) pieces the same as the video game Tetris invented by Alexey Pajitnov from the Soviet Union, June 6, 1984

Make all possible tetrominoes using color tiles
Tetrominoes

Make all possible tetrominoes using color tiles
Activity 2
Tetromino Cover Up
Pentominoes are thought to have been “invented” by Solomon W. Golomb in 1953, during a talk he gave to the Harvard Mathematics Club. He is credited with coining the name pentominoes, but they have been around since a much earlier time.
Henry Ernest Dudeney, a great English inventor of puzzles, created the first pentomino problem, which was published in the Canterbury Puzzles in 1907.
Activity 3

- Display the correct way to connect 5 squares to make a pentomino
- Use color tiles to make all possible pentominoes
- Using commercial pentominoes
- Find the pentomino that has the least perimeter, a line of symmetry, and rotational symmetry
Each pentomino consists of 5 square blocks joined together with at least one common side. There are 12 different pentominoes named after the letters of the alphabet.
Activity 4

Pentomino Squeeze
Literature Selection

Chasing Vermeer by Blue Balliett
Illustrated by Brett Helquist
Activity 5

*Chasing Vermeer* by Blue Balliett

Break the Calder’s Pentomino Code

- It is odd but even
- What animal is in each picture? How many of each?
- View pictures from some of the chapters
Calder’s Code

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Activity 6

Pentomino Activities, Simple to Complex