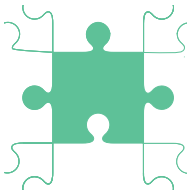


Shape and space: Transformation – Suggestions for teaching

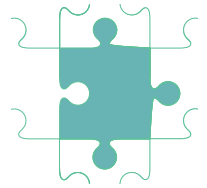


FOSTERING PRODUCTIVE DISPOSITION

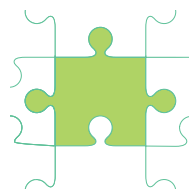
- Encourage children to engage in practical transformation activities with their peers, e.g., *manipulating 2-D and 3-D shapes to create artwork, enlarging images using photocopiers.*
- Highlight 'real-world' uses of transformation, e.g., *in crafting, construction, architecture, and interior design.*
- Provide opportunities for children to explore transformations and tessellations in art and architecture around the world, and draw/complete images of these using grids, e.g., *tessellation in the art of M.C. Escher, symmetry and rotational symmetry in famous landmarks such as the Eiffel Tower, Taj Mahal, etc.*

ENCOURAGING PLAYFULNESS WITH MATHEMATICS

- Encourage the children to develop their understanding of transformations through games and puzzles, e.g., *tangrams, jigsaw puzzles, Tetris and online games such as Minecraft.*
- Highlight and provide opportunities for children to explore and experiment with transformations through their own areas of interest, e.g., *movements in dance and other sports, symmetry and tessellation in clothing, symmetry in nature.*
- Challenge the children to complete transformations collaboratively, using a range of materials and digital tools, e.g., *2-D and 3-D shapes, geoboards, mirrors, grids, virtual manipulatives.*



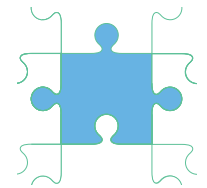
USING COGNITIVELY CHALLENGING TASKS



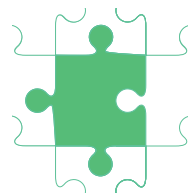
- Provide opportunities for children to investigate and engage in open-ended tasks involving transformation, e.g., *design a theme park ride that features rotational symmetry, create a board game that features translation of game pieces.*
- Vary tasks to provide appropriate levels of challenge, e.g., *vary number of steps in a translation, the complexity of geometric shapes for tessellation, the number of co-ordinates in an image to be reflected or translated on a grid.*
- Encourage children to collaboratively design patterns using tessellating polygons for enjoyment, and for specific purposes, e.g., *creating seasonal artwork, interior design tasks online or in models of buildings.*

EMPHASISING MATHEMATICAL MODELING

- Ensure that children have opportunities to explore transformations with a selection of resources, e.g., *2-D and 3-D shapes, art materials, geoboards, grids, digital tools and graphs.*
- Encourage children to choose suitable ways to represent their ideas for reflection, rotation and tessellation, e.g., *photographs, drawings, concrete representations, graphs, tables, using co-ordinate grids.*
- Facilitate the children in applying their models for investigating transformation to new and meaningful contexts, e.g., *explore symmetry in photographs of famous or local architecture.*



PROMOTING MATHS TALK



- Model the use of language of transformation in everyday experiences and in other areas of the curriculum, e.g., *symmetry in artwork, enlarging objects by 'zooming in' with a camera, rotating hands, feet, hips, etc. in stretches for sports.*
- Provide opportunities for the children to engage in mathematical discussion about transformations through open-ended and higher-order questioning, e.g., *tell me about the ways that this shape can be changed or transformed? Describe the features of a shape that support tessellation? Explain how many unique nets of a cube/cuboid are possible?*
- Encourage the children to represent and share their knowledge and understanding of transformations through movement and gestures as well as discussion.