



MATH +



ARCHITECTURE

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Culminating Task

This project incorporates concepts of visualization, mental rotation, and transformations from 2D shapes to 3D structure. The overall objective is for students to acquire the skills needed to construct and create their own 3D building.



Visualization and Mental Rotation

- Visualization uses the mind's eye to manipulate mental images
- Students will develop the ability to understand complex spatial patterns and imaginary movements
- Mental rotation is an extension of visualization which involves mentally rotating 2D and 3D shapes
- These are fundamental skills needed in order to transform 2D shapes into 3D objects.

Composing, Decomposing and Transforming 3D

- We live in a 3D geometric world, but often only teach students about 2D concepts
- It is important to teach students the complementary relationship between 2D and 3D geometry
- In particular, understanding transformations like flips, slides, turns, stretching, twisting and scaling and becoming flexible in this thinking
- With this knowledge, students can plan and design a 2D blueprint to be constructed into a 3D building

Extensions: Measurement

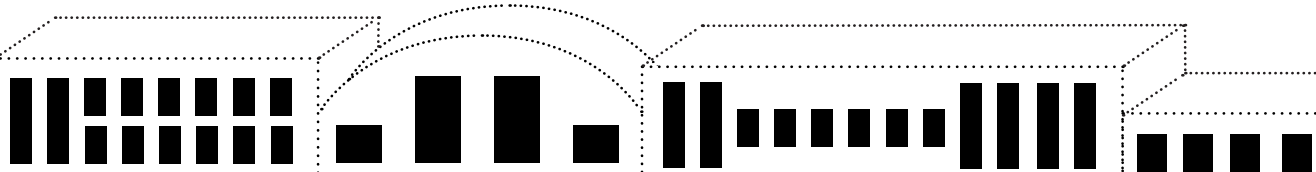
- Measurement serves as a context to help students understand other concepts such as fraction, decimals and multiplication
- Gives students the opportunity to learn about the relationship between perimeter and area in architecture
- To help students understand relationships in measurement, teachers should provide them opportunities to investigate using real-life problem settings



SEQUENCE OF ACTIVITIES

1 Visualization/Drawing Different Points of View

- Take a walk around the school
- Sketch the different sides
- Use pictures of the school as a tool to draw the front, side, and top if needed



2 Perspective Taking

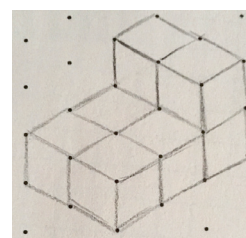
- View pictures of a variety of buildings
- Visualize and brainstorm ideas for their own building
- Build a snap cube structure
- Draw front, side, and top in 2D on graph paper



3 Culminating Task- Create a 3D Structure

- Collaborate and discuss with classmates on their building plans
- Use various materials to construct their 3D structure

4 Transferring 3D Designs onto Isometric Dot Paper



- Learn how to draw on isometric dot paper
- Draw completed 3D structure onto isometric dot paper