

Nets

Summary

Students will design and create patterns from grid paper to make boxes or cubes.

Main Core Tie

Mathematics Grade 2

[Strand: GEOMETRY \(2.G\) Standard 2.G.1](#)

Materials

- Tiles or squares from pattern blocks
- [Dot Grid](#) (pdf)
- 1" cube
- [1" Grid](#) (pdf)
- Scissors
- Tape

Background for Teachers

Geometry Definitions

Cube--a space figure that has six squares and no other faces

Edge--a segment where two faces are joined together

Face--one of the plane figures making up a space figure

Vertex (Pl: vertices)--the common point where three or more edges meet

Intended Learning Outcomes

1. Demonstrate a positive learning attitude toward mathematics
2. Become mathematical problems solvers.
3. Reason mathematically.
4. Communicate mathematically.

Instructional Procedures

Invitation to Learn

Today you are going to be mechanical engineers designing boxes to fit the cube exactly. You will work with a partner, your task is to find as many ways as possible to make patterns for boxes. The team that finds the most patterns wins the contract (prize).

Instructional Procedures

Task 1

Pass out tiles and *Dot Grid* and discover the various patterns for omينو, domino, triomino, tetraomino, pentomino, and hexomino shapes. Discuss repeats of slides, turns, or flips do not count as different shapes. Each segment must touch a complete segment of an adjoining square.

Task 2

Find patterns for boxes that will fit one cube. Each pattern must follow three rules:

It must be made from a single piece of paper

It can be folded only along the edges of the squares

No sides can overlap

Hint: If your pattern doesn't work, how can you change it to make it work?

When you find one that works, draw it on *1" Grid* and cut it out in one piece.

Allow students to discuss the strategies they used to devise their patterns.

Have the students show their patterns on an overhead or on the chalkboard.

For each pattern posted, ask if the class agrees that it works. When there is disagreement, students should justify their beliefs.

Sometimes students will post duplicate patterns. Discuss which patterns are flips or turns.

Extensions

Repeat the activity for creating nets to build a triangular prism or boxes to fit two cubes.

Family Connections

Find a box at home. Draw a net that you think will fit the box exactly. Cut it out and try it. Did it work? If not, what could you change to make it work? Try it.

If possible, cut the box on the edges so that it opens flat to create a net. Is it different than the net you created?

Assessment Plan

Were the students able to create at least one net?

Provide examples and non-examples of nets for cubes. Can the students identify the correct choices?

Use Family Connections as an assignment.

Authors

[Utah LessonPlans](#)