

Attributes & Nets of a Cube

Summary

Students will use their knowledge of attributes of cubes, work together in groups and find as many as possible to make a cube.

Main Core Tie

Mathematics Grade 6

[Strand: GEOMETRY \(6.G\) Standard 6.G.4](#)

Materials

- Math journals & pencils
- Three dimensional cubes
- [Attributes of a Cube](#)
- *An Important Book*
- [Important Writing Stationary](#)
- [2" Grid paper](#)
- Important Booklet Instructions
- 9"x12" sheet of construction paper
- 2" squares of colored paper
- Nets of a cube
- Scotch tape
- Nets of a cube (plastic canvas)
- An Important Book Instructions:*
 1. Fold a 12"x18" piece of manila construction paper in half horizontally and then open it up and lay it flat again.
 2. Next, fold it again vertically 2 times (fold in half and in half again)
 3. Unfold once. Cut on the fold to the middle fold line, and open up paper.
 4. Now fold the paper horizontally.
 5. Squeeze the ends toward the center, fold and crease.
 6. Small booklet makes 8 pages.
 - a. 1 page -- cover
 - b. 1 page -- back
 - c. 6 inside pages

Ways to use the book: Most important thing about: 3rd grade, a new friend I met, fractions, geometric shapes, etc. (Great idea when using attributes.)

Additional Resources

Books

- *An Important Book*

by Margaret Wise Brown ISBN: 0064432270

Background for Teachers

A cube consists of six square faces, twelve edges, and eight vertices. When the square faces of a cube are separated at the edges and laid out flat they make a two dimensional figure called a net.

There are eleven different nets for a cube.

Net -- a two-dimensional shape that can be folded into a three-dimensional figure is a net of that figure.

Face -- a plane figure that serves as one side of a solid figure. The faces of a cube are squares.

Vertex (vertices) -- the point at which two line segments, lines, or rays meet to form an angle.

Edge -- the line segment where two faces of a solid figure meet.

Today students will use their knowledge of attributes of cubes, work together in groups and find as many ways as possible to make a cube. A two-dimensional pattern for a three-dimensional shape is called a "net."

Students will work together in small groups and each group will be a different color. They will use tape to piece together shapes that fold into a cube.

Intended Learning Outcomes

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

Instructional Procedures

Invitation to Learn

Bring students to the floor. Ask, "who can say what an attribute is? An attribute describes something about an object or person. Call on a student to stand in front of the class and state an attribute of the child (the color of their hair, eyes, shoes, etc.). Today we are going to learn about attributes of a cube. Read the book *An Important Book* by Margaret Wise Brown.

Tell the students that, as detectives, they will be describing the attributes of a cube.

Instructional Procedures

As a class choose a two- or three-dimensional object in the classroom (for example: the globe or the flag). Have the students come up with attributes while the teacher lists the attributes on the board.

Hold up a cube and discuss with the students the different attributes of a cube making sure they call the "sides" faces. Ask students to write the attributes in their math journals.

Ask students to look around the room and name items that are shaped like a cube. Check before hand and make sure you have at least one or two cube shaped objects in the room! If it hasn't been brought up, ask students what two-dimensional shapes makes up the cube.

Next go over the attributes of a cube. List them on the board. Have the students write them in their journals.

Next have the students come up with why they think the cube shape is important. Have them come up with an item in real life that is shaped like a cube and list the attributes. Have students complete "An important thing" worksheet. After completing the sheet, students may make a booklet of their attributes.

Next, students work together in groups of four, using the two-inch squares, to come up with as many different nets for a cube as possible. Give each group two sets of 6 so that everyone in

the group has a chance to try out their ideas. Once they think they have a net, have them prove that it works by copying the net onto the 2" grid paper, cutting it out and folding it into a cube. You may want to show the whole class the first few working nets that are discovered. You can make it into a competition to keep students focused. The group with the most different nets for a cube is the winner.

Closure

In math journals, have students come to the floor and write down the attributes of the nets.

Each net has six squares that when folded properly form the six faces of a cube

For each net, six faces are connected by five edges Have students share and write what they learned about a cube.

Cubes have twelve edges

eight vertices

six faces

Assessment

Students can use graph paper to draw the different ways they found to make a net.

Student Important book about a cube.

Journal entries.

Students create a booklet that will demonstrate the knowledge of attributes of a cube.

Extensions

Curriculum Extensions/Adaptations/ Integration

Great for integrating Language Arts and writing into mathematics

Family Connections

Students go on a scavenger hunt for "cube" shapes at home.

Assessment Plan

Concentration game with attributes of a cube

- [*I Have: Who Has?*](#)
game

Bibliography

Research Basis

Beattie, V., Collins, B., & McInnes, B. (1997). Deep and surface learning: A simple or simplistic dichotomy? *Accounting Education*, 6(1), 1-12.

Deep learning verses surface or rote learning is essential for students to gain an understanding for learning. Student learning processes for deep learning include using different learning styles to enhance student's personality.

Hartshorn, R., & Boren, S. (1990 June). *Experiential learning of mathematics: Using manipulatives*. Washington, DC: ERIC Clearinghouse on Rural Education and Small Schools, ERIC Digest. (ERIC Document Reproduction Service No. ED321967)

Active involvement with different learning styles will enhance student learning. Because mathematics is so abstract it becomes difficult for students to understand. Therefore, the use of manipulatives is essential for learning.

Authors

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