**Standard 4: Concepts and Principles of Geometry**

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| --- | --- | --- | --- | --- | --- |
| Goals: | Objective 1 | Objective 2 | Objective 3 | Objective 4 | Objective 5 |
| **Goal 4.1: Apply concepts of size, shape, and spatial relationships.** | 4.M.4.1.1 Identify, compare, and analyze attributes of two- and three- dimensional shapes, including parallel, intersecting, and perpendicular lines, and develop vocabulary to describe the attributes. (301.01.a)  CL: B, C, D  Calc: NO  Content Limit: Identify and compare only. Two-dimensional shapes limited to triangles, quadrilaterals (rectangle, square, rhombus, and trapezoid), and hexagons. Three-dimensional shapes limited to cubes, cylinders, cones, spheres, pyramids, and rectangular prisms.  ‘Analyze attributes … and develop vocabulary to describe the attributes’ to be assessed in the classroom, not on the ISAT. | 4.M.4.1.2 Predict the results of sliding and flipping two-dimensional shapes. (301.01.d)  CL: D  Calc: NO  Content Limit: Use diagrams showing non-regular polygons on a grid. Include items where student is given a description and there is a graphic shown for each answer option. | 4.M.4.1.3 Identify multiple lines of symmetry in two-dimensional shapes.  CL: B, C  Calc: NO  Content Limit: Shapes limited to parallelogram, hexagon, and octagon. | 4.M.4.1.4 Discuss perimeters of polygons, and areas and perimeters of rectangles and squares, using concrete objects. (301.01.c)  CL:  Calc:  Content Limit: Assessed in the classroom, not on the ISAT. | 4.M.4.1.5 Use appropriate vocabulary. (301.01.e)  CL:  Calc:  Content Limit: Assessed in the classroom, not on the ISAT. |
| **Goal 4.3: Apply graphing in two dimensions.** | 4.M.4.3.1 Use ordered pairs to identify the position of a point in the first quadrant on a coordinate grid.  CL: C  Calc: NO  Content Limit: Coordinates are whole numbers. Point may not be on *x*-axis or *y*-axis. |  |  |  |  |

**Geometry**

Big Ideas: 2-D and 3-D shape and attribute identification. Angle measures and identification. Geometric vocabulary

**Resources:** Navigations “Navigating through Geometry”

Scott Foresman volume 3 pg. 438-459

**Day 1**: **Give the pre test/ DMT task**

**Objectives:**

CO: We will show our prior knowledge of geometry and complete a common math task.

LO: We will complete our geometry pre test and a common math task to the best of our abilities.

Materials: Tests, tasks, geometry crosswords

Standards: NA

**Day 2: Perimeter - Quadrilaterals**

CO: We will understand perimeter

LO: We will use a ruler to measure the length and width of our desk to find the perimeter. We will move around the room measuring quadrilaterals.

Materials: Rulers, math notebooks

Standards: 4.M.4.1.4

**Day 3: Perimeter - Polygons**

CO: We will review concepts of perimeter.

LO: We will measure several polygons to find their perimeter and complete a Drops in a Bucket math review.

Materials: SuperTeachers Worksheet, Drops in a Bucket math review

Standards: 4.M.4.1.4

**Day 4: Shape Up with Activity Packet**

CO: We will review polygons and angles

LO: We will investigate examples of angles and polygons using the book Shape Up, cheese, and pretzels. We will listen and create various polygons as Shape Up is read.

Materials: Shape Up, Student materials: 2 slices of cheese, 2 paper plates, toothpicks, pretzel sticks, rulers, graph paper, pencil, plastic knife, slice of bread, packet, gallon baggie (per student)

Standards: 4.M.4.1.1



**Day 5: Triangles and Geo Paper**

Thinking About Triangles *Navigations* pg. 15

Refer to pg. 444-445 *Scott Foresman*

**Objectives:**

CO: I will show my knowledge of geometry.

LO: I will use geoboards to investigate properties of a triangles.

I will transcribe geoboards design onto geodot paper.

I will make conjectures about triangles

I will show sliding with triangles

Materials: Geo boards, geo dot paper

Complete the activity from *Navigations*. Then refer to pg. 444 *SF* for the different types of triangles. Have students complete a table in their math journals with the different triangles.

Standards: 4.M.4.1.1, 4.M.4.1.2

|  |  |  |
| --- | --- | --- |
| Drawing | Name | Attributes |
|  | Equilateral | All sides same length |
|  | Isosceles | At least two sides same length |
|  | Scalene | No sides same length |
|  | Right | One right angle |
|  | Acute | All three angles acute |
|  | Obtuse | One obtuse angle |

Then have students create these triangles on geo board and draw on dot paper. Have them slide their triangle at least 2 times.

**Day 6: Sorting 2- Dimensional Shapes**

CO: I will show my knowledge of geometry by classifying polygons.

LO: I will classify and categorize polygons according to their attributes.

I will identify the attributes of plane shapes: angles, sides and vertices

I will graph squares and rectangles on graph paper given coordinates.

Materials: Category labels, paper cut out shapes, rings, butcher paper for each group to make taxonomy of polygons

Standards: 4.M.4.1.1, 4.M.4.3.1

Refer to pg. 438 *SF.* Give students the cut out shapes; they sort however they want to. Then give them the task cards and they need to sort in those parameters. After each task students explain their thinking in words in math journal.

Students are going to sort their shapes according to the taxonomy of polygons. They need to show this on butcher paper with heading and drawn shapes and shape names.

Example:

Polygons

Quadrilaterals

When shapes are categorized, students will graph them onto graph paper given coordinates.

Day 6:

Sorting 2-D and 3-D shapes

**Objectives:**

CO: I will show my knowledge of geometry by categorizing polygons and solids.

LO: I will classify and categorize polygons and solids according to their attributes.

I will create the following solids: rectangular prism, cube, sphere, cylinder, cone, and pyramid.

I will identify and record the attributes of solids: faces, edges, and vertices (apex).

Materials:

2-D shapes, 3-D solids, notebook paper to record attributes and name, play dough.

Standards: 4.M.4.1.1

1. Give students polygons from yesterday plus solids to sort. They can choose how to sort no more than 3 categories and they need to justify. Discuss as a class.

Refer to pg. 434*SF* after you have the students sort the shapes. Discuss the attributes that 3-D has compared to 2-D.

1. Students are now going to create a solid in play dough. Solids: sphere, cone, cylinder, square pyramid, rectangular prism, cube.
2. Gallery walk: students will be looking at the solids and recording the information about the attributes in their math journals

Example:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Drawing | Vertices | Faces | Polygon Face | Edges |
| Cube |  | 8 | 6 | Square | 12 |
| Sphere |  | 0 | 0 | 0 | 0 |
| Cone |  | Apex | 1 | Circle | 0 |
| Rectangular Prism |  | 8 | 6 | Rectangle | 12 |
| Cylinder |  |  |  |  |  |
| Square pyramid |  |  |  |  |  |

Day 7:

Circle Construction/Area of Squares

**Objectives:**

CO: I will show my knowledge of geometry.

LO: I will draw and label a circle. I will begin calculating area of squares.

Materials:

Math text 448 *SF,* compass, paper, area worksheet

1. Draw a circle using compass
2. Label: chord, center, diameter, radius
3. Complete page 448- 449

Standards: 4.M.4.1.4

Chord

Diameter

Center

Radius

Students will discuss area and fill out a basic area worksheet.

**Day 9: Pirate Geometry Bingo**

CO: We will review geometry with a geometry bingo game.

LO: We will play geometry bingo, reviewing our concepts of angles, lines, and polygons.

Materials: Geometry Bingo Boards, Bingo Call Cards, Marking Pieces

Standards: 4.M.4.1.1

**Day 10: Attribute Construction/Area of Polygons**

CO: I will show my knowledge of geometry.

LO: I will create polygons from a list of attributes.

I will show my knowledge of flipping and sliding with geodot paper.

Materials:

Attribute cards, paper, shape cards

1. Give each student a set of attributes they must create the polygon that fits.
2. Partner up kids, they are to describe a shape to partner by using attributes, partner needs to draw the shape.

Standards: 4.M.4.1.1, 4.M.4.1.2, 4.M.4.1.4

|  |  |
| --- | --- |
| A four sided polygon having exactly one pair of parallel sides | 1. This shape has 3 sides  2. No sides are the same length |
| A polygon whose sides are all congruent and angles are congruent. |  |
|  |  |

Show flipping and sliding with the shapes with geodot paper. We will continue looking at area by drawing quadrilaterals on graph paper and counting the number of squares.

**Day 11: Wax Paper Compasses**

CO: I will show my knowledge of geometry.

LO: I will create a compass out of wax paper.

I will use the compass to measure angles and figure out the angle measurement.

I will identify the degrees and name of specific angles.

Materials: Wax paper for each student, pg. 440- 443 *SF*. Popsicle sticks, construction paper

1. Record the geometric terms in books
   1. Point, line, line segment, ray, angle, parallel lines, perpendicular lines, and intersecting lines
   2. Complete pages 440-441
2. Create the wax paper compass
3. Use the compass to measure the 4 different angles
   1. Create the 4 different angles using popsicle sticks and construction paper
   2. Complete pg. 442-443

Standards: 4.M.4.1.1

**Day 12: Geometry Riddle/Flex Day**

CO: We will show our knowledge of geometry by writing riddles for our classmates.

LO: We will create riddles from geometric attributes and have our partner draw the polygon.

Materials: Geometry Riddles Handout

Standards: 4.M.4.1.1

**Day 13: Geometry Jeopardy Review**

CO: We will review our knowledge about geometry.

LO: We will review geometry with Geometry Jeopardy as teams.

Materials: Geometry Jeopardy PowerPoint, Paper

Standards: 4.M.4.1.1

**Day 14: Post Test**

C.O. I will show my knowledge of geometry.

L.O. I will complete the post test for geometry.

Materials: Post Test

Standards: NA

**Common Core Standards:**

**Geometric measurement: understand concepts of angle and measure angles.**

5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.

b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

**Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**

1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

\*Covered by Current Unit