Geometry Unit

(Focus on Plane Figure)

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Second Grade Math

Unit Outcomes

Sub Unit 1-Shape Attributes

* Students will be able to recognize and identify the shapes by name and identify the number of sides each shape has. (Comprehension)
* Students will identify two-dimensional shapes as plane figures (Comprehension)

Sub Unit 2-Identifing Shape Attributes Correctly

* Students will recognize two-dimensional figures as plane figures and identify correctly by name (Knowledge)
* Students will create two-dimensional figures and label correctly (Application)

Sub Unit 3-Tangram Use

* Students will display knowledge of shapes by placing two shapes together to create a new shape (Knowledge, Comprehension, Application)
* Students will trace a pattern (new shape) and have a partner recreate with their tangram set (Knowledge, Application)
* Students will create new shapes and patterns by moving tangrams around on pattern cards and then without the use of pattern boards (Application)
* Students will correctly identify shapes (Knowledge)

Sub Unit 4-Symmetry

* Students will correctly categorize shapes as symmetrical or non-symmetrical (Analysis, Synthesis)
* Students will recognize that a shape can be folded in half to determine it’s symmetry (Comprehension)

Sub Unit 5-Symmetry Quilt

* Students will work as individual creating their own square for the classroom quilt (Application, Evaluation)
* Students will correctly locate the line of symmetry of each square (Knowledge, Application, Comprehnesion)
* Students will create their own pattern for their quilt square (Application)

Sub Unit 6-Congruency

* Students will understand that shapes can be congruent because they are he same size and shape (Comprehension)
* Student will identify if a shape is congruent or similar (Comprehension)

Pre- Assessment

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Identify the shape name

Identify how many sides each shape has

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What two shapes make this figure?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Are these shapes congruent? Congruent means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Are these shapes congruent?

Are these shapes symmetrical? Symmetry means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Lesson 1

Duration: 50 minutes (connect to Lesson 2)

Description:

* Students will listen to the story The Greedy Triangle and use geoboards to recreate the shapes from the story.

Goals:

* Students will be able to recognize and identify the shapes by name and identify the number of sides each shape has.
* Students will identify two-dimensional shapes as plane figures

Objectives:

* Students will be able to recognize the following shapes: circle, rectangle, square, triangle, parallelogram and rhombus
* Students will locate an object in the room that represents each shape: circle, rectangle, square, triangle, parallelogram and rhombus
* Students will recreate the circle, rectangle, square, triangle, parallelogram and rhombus on the geoboard

Materials:

* The Greedy Triangle by Marilyn Burns
* Geoboards for each student
* Rubber bands (colored)
* Pictures of shapes
* Clear geoboard for the overhead
* Overhead

Vocabulary:

* Plane figure
* Circle
* Square
* Triangle
* Parallelogram
* Rhombus

Procedure:

Discuss (by asking them to contribute the information) with students shapes names and how many sides each shape has. Hold up pictures of shapes to be identified in both categories of name and number of sides. Read The Greedy Triangle. Ask them to listen to shape names mentioned in the story. Review shape names again after the story (they provide) and explain that these are called “plane figures”. Ask for knowledge of plane figures. Chart responses. Clarify any misunderstandings if needed.

Students pick up goeboards and rubber bands then return to their desks. Model how to create each shape on the board. After all shapes have been created on the board allow 5-10 experimental play time with the boards.

Closing: Flash the pictures of the shapes and in chorus have the students name the shape and the number of sides.

Assessment:

* During the geoboard use, observe if students are following directions
* Do the shapes look the way they are supposed to
* Can the students identify the name and sides of the shapes (informally)

http://www.amazon.com/Greedy-Triangle-Brainy-Day-Books/dp/0590489917# Top of Form

Bottom of Form

Lesson 2

Duration: 45 minutes (connected with Lesson 1)

Description:

* Students will retell the story of The Greedy Triangle from yesterday, describe shape names and sides, and then create each shape out of construction paper. The shapes will be labeled (word bank on chalk board for correct spelling) with the name and number of side and glued to green stems in order to create our “PLANE Garden” bulletin board.

Goals:

* Students will recognize two-dimensional figures as plane figures and identify correctly by name

Objectives:

* Students will create two-dimensional figures and label correctly

Materials:

* The Greedy Triangle
* Pictures of shapes
* Construction paper
* Pre-cut stems (green construction paper)
* Word bank of shape names on the board (after the students provide the name)

Vocabulary:

* Plane figures
* Two-dimensional

Procedure: Students will retell story from yesterday and then identify shapes from the book. These names will then be written on the board for correct spelling. Each student will draw and cut out all six shapes, label with correct name and identify, in writing, the number of sides of each shape. The shapes will then be glues to the green stem and later placed on the bulletin board for the class “PLANE Garden”.

Closing: Students will be able to share and view each others shapes.

Assessment:

* Record if the shapes are the correct form
* Identified correctly (proper spelling is a must)
* Are the sides identified correctly

Lesson 3

Duration: 45 minutes

Description:

* Students will manipulate tangrams creating new shapes and producing recognizable figures with the shapes from the tangram set

Goals:

* Students will display knowledge of shapes by placing two shapes together to create a new shape
* Students will trace a pattern (new shape) and have a partner recreate with their tangram set

Objectives:

* Students will create new shapes and patterns by moving tangrams around on pattern cards and then without the use of pattern boards
* Students will correctly identify shapes

Materials:

* Tangram sets for each child
* Pattern cards
* Pencil/Paper
* Overhead

Vocabulary:

* Tangrams

Procedure: Each child will be given a set of tangrams and allowed free exploration time prior to the beginning of the lesson. Students will be asked to give facts about what they have. Information will be categorized on the chalkboard accordingly (color, shape, sides…). The “tangram” sets will be introduced with a pattern card on the overhead. Students will be asked to hold up each shape as the teacher calls the name of the shape. The teacher will then display how some shapes will need to be turned or flipped in order to fit the pattern correctly. Students will then be given time to recreate several pattern cards. Students will then be asked to form their own new shapes (pattern) with the tangrams. Again, several examples are to be done. They will then be asked to trace one of these new patters or shapes onto paper and ask a partner to recreate it using their tangram set.

Closing: The teacher is to bring to groups attention back to the overhead and create a design and have the children recreate this new shape at their desk without a pattern card. These materials will then be available in the math center.

Assessment:

* Observe to see if the student can recreate one shape from the pattern card
* Observe to see if the student can make their own shape and trace it accurately
* Observe to see if the student can make a new shape with no pattern to follow
* Observe to see if the student can correctly identify each shape and it’s attributes

 This pattern can be used to create student sets of tangrams

 http://www.enchantedlearning.com/crafts/chinesenewyear/tangram/template.shtml

Lesson 4

Duration: 50 minutes

Description:

* With the use of flash card shapes, construction paper cut outs of shapes and capital letters the students will identify if the items are symmetrical or non-symmetrical.

Goals:

* Students will correctly categorize shapes as symmetrical or non-symmetrical

Objectives:

* Students will recognize that a shape can be folded in half to determine it’s symmetry

Materials:

* Pre-cut shapes (circle, square, rectangle, diamond, heart, oval… ) as well as two cut-outs of non-symmetrical shapes, and pre-cut capital letters for each child
* Flash cards of shapes
* Chart paper labeled SYMMETRICAL NON-SYMMETRICAL

Vocabulary:

* Symmetry
* Symmetrical
* Non-symmetrical
* Line of Symmetry

Procedure: We will review the shapes that were in the tangram sets from the previous lesson and look for those shapes in our classroom. Explain that some shapes can be folded in half to make both sides look the same. These shapes are called symmetrical shapes. The line that splits to shapes into halves is called the line of symmetry. NOT all shapes have a line of symmetry. Some shapes will have more than one line of symmetry.

Students will then go through each (symmetrical) shape and find the line(s) of symmetry. Then they will be asked to try to find a line of symmetry on their “other” shapes. Continually ask throughout the lesson: how many lines of symmetry can be found, why is/is not there a line of symmetry?

Students will then each be given a letter of the alphabet and be asked to come up in order and place the letter on the chart paper in the correct category of SYMMETRICAL or NON-SYMMETRICAL

Closing: Teach a line to the geometry song. Based on the tune of “Skip to The Lou My Darling”.

Symmetry means matching parts, Symmetry means matching parts, Symmetry means matching parts,

 It matches when you fold it.

Assessment: Students are given activity page to identify symmetry and complete the symmetrical shapes.

 http://www.enchantedlearning.com/math/geometry/shapes/

Lesson 5

Duration: 35 minutes

Description:

* A classroom quilt will be created based upon symmetry of squares.

Goals:

* Students will work as individual creating their own square for the classroom quilt

Objectives:

* Students will correctly locate the line of symmetry of each square
* Students will create their own pattern for their quilt square

Materials:

* 16 one inch squares for each child
* crayons

Vocabulary:

* Symmetry

Procedure: We will review symmetry from yesterday (shapes and letters). Students will each be given 16 white squares. They will be asked to choose one color from their crayons and find the line of symmetry for each square. Half of the square will remain white where half of it will be colored. Once all 16 squares are made symmetrical and colored the students will arrange the square onto a larger page. Once they are satisfied with their pattern they are to glue the pieces down. All projects will then be connected together to make a large class quilt.

Closing: Students will share their work and place it on the wall.

Assessment:

* Students will need to correctly create lines of symmetry for each square

Examples:

<http://www.learner.org/teacherslab/math/geometry/shape/quilts/quilts_1.html>

Lesson 6

Duration: 45 minutes

Description:

* The concept of congruency will be introduced to the class through direct instruction and then followed up by an interactive activity.

Goals:

* Students will understand that shapes can be congruent because they are he same size and shape

Objectives:

* Student will identify if a shape is congruent or similar

Materials:

* 14 cut outs of congruent shapes (7 of each shape)
* 14 cut outs of similar shapes (7 of each shape and different from the above shapes)

Vocabulary:

* Congruent
* Similar

Procedure:

* A set of congruent shapes will be drawn on the board. The students will identify what they notice. Answers will be recorded. Probing for words such as similar, size and shape may be necessary. Connect those terms to the word congruent. Draw several more examples on the board following the same procedure.
* A set of similar shapes will be drawn on the board with the same procedure as stated previously.
* Students will then be given a pre-cut shape randomly. They will need to find their partner and *identify themselves as either congruent or similar to the class.*

Closing: Teach a line to the geometry song. Based on the tune of “ Skip to The Lou My Darling”.

Congruent means same size and shape, Congruent means same size and shape, Congruent means same size and shape,

Same size and shape

Assessment: Activity Sheet

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Are these congruent shapes? yes no

2. Are these congruent shapes? yes no

3. Are these congruent shapes? yes no

Post- Assessment

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Identify the shape name

Identify how many sides each shape has

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What two shapes make this figure? Create your own figure here.

 Use TWO (2) shapes.

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Are these shapes congruent? Congruent means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Are these shapes congruent?

Are these shapes symmetrical? Symmetry means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.