

**UNIT PLAN #1:
Simply Shapes**

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UNIT PLAN #1: Simply Shapes

Grade Level: 1

General Objective: Students will be able to develop the concept of geometry through cooperative learning. Students will use skills in problem solving, patterning, classifying, graphing, and comparing to gain an understanding of basic shapes in their everyday life.

Overview:

- Lesson 1: Background of Geometry and the Square
- Lesson 2: The Triangle
- Lesson 3: Symmetry
- Lesson 4: The Circle
- Lesson 5: Rectangles
- Lesson 6: Reviewing Rectangles and Circles
- Lesson 7: Congruency
- Cumulative Assessment/Evaluation

Resources: I found my idea for the lesson plan on www.coreknowledge.org.
I found my worksheets on math.about.com/library/shapebook.pdf.
I used an assessment from <http://teach-nology.com/worksheets/> on my unit plan.

Rationale

This unit plan was designed to introduce students into the basic forms of geometry. The students will participate in a variety of hands-on activities within the 7 lessons taught. These lessons will develop the concept of geometry in a very interesting manner for these young children. They will work within groups and also amongst themselves in order to get a good blend of the essential knowledge of these basic geometrical shapes. This unit will also have the students compare and contrast these basic shapes, allowing the students to look outside of the box as they form knowledge of geometry.

Lesson 1: Background of Geometry and the Square

NCTM Standard:

Standard 9: Geometry and Spatial Sense

- describe, model, draw, and classify shapes
- investigate and predict the results of combining, subdividing, and changing shapes
- develop spatial sense
- recognize and appreciate geometry in their world

Pennsylvania Content Standards Grade Level Benchmarks:

- 2.9 Geometry A. Identify and label two-dimensional shapes
- 2.9 Geometry B. Construct and reproduce a two-dimensional shape
- 2.9 Geometry C. Draw two-dimensional geometric shapes
- 2.9 Geometry D. Name and describe two-dimensional geometric figures in real life

Objective(s): Prior to the completion of this lesson:

- Students will be able to identify, recognize, and create a square.
- Students will gain background knowledge of the history of geometry and be able to name at least one key fact they have learned from this history.

Materials:

- Variety of different square sizes for group use
- Yarn
- Large square for measuring
- Journal to keep work in
- Popsicle sticks
- Charts labeled "squares"
- Magazines

Anticipatory Set/Introduction:

1. At the beginning of lesson, teacher must assume that students have no background knowledge of the subject.
2. Explain the history of Geometry to the students. Explain to them that geometry is the part of mathematics that includes points, lines, surfaces, and solids. The word comes from the Greek words for earth and measure. It is divided into two categories: plane and solid geometry. Plane geometry is two dimensional shapes in one plane while solid geometry is three dimensional shapes.

Instructional Procedures:

1. After discussing the history of geometry in your introduction, begin displaying various sized squares throughout the classroom.
2. Ask the students what they know about these shapes around the classroom while recording their answers on a chart. Expected responses should be that they have four sides, they have four corners, and the sides are all the same.
3. Display a large square in front of the classroom for all students to view together. Use the yarn to measure each side of the angle to prove that the square is a true square with equal sides.
4. Teacher and class will make a large square using cubes as guided practice.
5. Students will then create a square using a set of manipulatives, such as cubes, blocks, etc. They will create this square in cooperative groups and once they have finished, a member from each

group will share with the class the manipulative they used and how their square has been created.

6. Once group work has been completed, students will independently cut out a picture of a square from a magazine and paste it onto the chart about squares that was made earlier in the class.

Evaluation/Assessment:

1. Students will glue popsicle sticks into their journal to form a square. They will label their square appropriately and write out that a square is a plane figure having four equal sides and four right angles.
2. For homework, students will complete the squares handout provided for them after the lesson has been completed.
3. Evaluation will also consist of participation, following directions, and encouraging dialogue among groups

Lesson 2: The Triangle

NCTM Standard:

Standard 9: Geometry and Spatial Sense

- describe, model, draw, and classify shapes
- investigate and predict the results of combining, subdividing, and changing shapes
- develop spatial sense
- recognize and appreciate geometry in their world

Pennsylvania Content Standards Grade Level Benchmarks:

- 2.9 Geometry A. Identify and label two-dimensional shapes
- 2.9 Geometry B. Construct and reproduce a two-dimensional shape
- 2.9 Geometry C. Draw two-dimensional geometric shapes
- 2.9 Geometry D. Name and describe two-dimensional geometric figures in real life

Objective(s): Prior to the completion of this lesson:

- Students will be able to identify, recognize, and create a triangle.
- Students will be able to compare and contrast two differences between triangles and squares.
- Students will be able to extend a given pattern.

Materials:

- Chart labeled squares from previous lesson
- Triangle cut out of cardboard
- Shopping bags
- Various sized triangles
- Journal to keep work in
- Chart labeled "triangles"
- Q-tips
- Magazines

Anticipatory Set/Introduction:

1. Place a triangle cut from cardboard into a large shopping bag. Have students feel the triangle without actually getting to see it.
2. Ask the students what they felt in the bag before displaying the triangle to the students.

Instructional Procedures:

1. Discuss with the students what a triangle is and record their answers on a chart, similar to the chart on squares.
2. Show the students different sized triangles, ones with all sides equal and others with sides of all different sizes. Refer back to the square chart to compare and contrast the two shapes.
3. Place students in cooperative groups, giving each group patterns of triangles to trace and discuss. Make some triangles of equal sides and other triangles of varying sizes.
4. Once students complete their cooperative work, have them go back into magazines and cut out a picture of a triangle to be glued on the triangle chart. Ask students why their shapes are triangles as they paste them on the chart to ensure their understanding.
5. To conclude the lesson, hand out 4 triangles to each student and have them create squares out of the triangles. This will help them to be able to compare and contrast squares and triangles in their minds.

6. Ask the students for some differences of the two shapes after they have finished creating these squares from the triangles

Evaluation/Assessment:

1. Give students q-tips and have them paste triangles into their journals.
2. These triangles will be made out of the q-tips and under one of the triangles they have made they will give the definition of a triangle; a plane figure having three angles and three sides.
3. For homework, students will complete the triangles handout provided for them after the lesson has been completed.
4. Evaluation will also consist of participation, following directions, and encouraging dialogue among groups.

Lesson 3: Symmetry

NCTM Standard:

Standard 9: Geometry and Spatial Sense

- describe, model, draw, and classify shapes
- investigate and predict the results of combining, subdividing, and changing shapes
- develop spatial sense
- recognize and appreciate geometry in their world

Pennsylvania Content Standards Grade Level Benchmarks:

- 2.9 Geometry A. Identify and label two-dimensional shapes
- 2.9 Geometry B. Construct and reproduce a two-dimensional shape
- 2.9 Geometry C. Draw two-dimensional geometric shapes

Objective(s): Prior to the completion of this lesson:

- Students will be able to identify and create at least one symmetrical shape.
- Students will be able to find symmetry within real life objects.

Materials:

- Squares chart and Triangles chart from previous lessons
- Butterfly pattern
- Various symmetrical and non symmetrical shapes.
- Various small designs for decoration of butterfly.

Anticipatory Set/Introduction:

1. Pass out triangles with at least one symmetrical side.
2. Pass out triangles with no sides being symmetrical.
3. Ask the students what are different between the two sides until someone comes up with the answer that one triangle has no equal sides while the other has at least a pair of equal sides.

Instructional Procedures:

1. Review the charts on squares and triangles from the first two lessons.
2. Place students into groups of 3-4 students and pass out multiple shapes to each set of students.
3. Ask the group to fold their shapes in half and place it into the center of the group so everyone can see it.
4. Teacher will ask leading questions about shapes in order to get their students to place their shapes into two piles, one pile being symmetrical and the other pile being non-symmetrical. An example of a question would be which shapes would look exactly the same if there were an imaginary line down the center
5. Introduce and explain the definition of the words symmetrical and line of symmetry. The definition of symmetry will be similarity of form or arrangement on either side of a dividing line. The definition of line of symmetry will be a straight line on which a figure can be folded so that the two parts fit exactly.
6. Have students bring up their pile of symmetrical shapes and demonstrate by cutting on the line of symmetry that the shapes are indeed symmetrical.
7. Have the students brainstorm objects in the classroom that are also symmetrical.

Evaluation/Assessment:

1. In partners, students will create their own symmetrical butterfly. Each group will be provided with a pattern and pieces necessary to decorate the wings of their butterfly. The students will work together to glue the pieces onto one wing and then also the same piece on the other wing in the same location.
2. Evaluation will also consist of participation, following directions, and the overall completion of the final butterfly project.

Lesson 4: The Circle

NCTM Standard:

Standard 9: Geometry and Spatial Sense

- describe, model, draw, and classify shapes
- investigate and predict the results of combining, subdividing, and changing shapes
- develop spatial sense
- recognize and appreciate geometry in their world

Pennsylvania Content Standards Grade Level Benchmarks:

- 2.9 Geometry A. Identify and label two-dimensional shapes
- 2.9 Geometry B. Construct and reproduce a two-dimensional shape
- 2.9 Geometry C. Draw two-dimensional geometric shapes
- 2.9 Geometry D. Name and describe two-dimensional geometric figures in real life
- 2.1 Numbers, Number Systems and Number Relationships
E. Add various coins together whose values are below one dollar.

Objective(s): Prior to the completion of this lesson:

- Students will be able to identify, recognize, and construct a circle.
- Students will be able to sort coins into similar groups.

Materials:

- Plastic containers
- Sand
- Different sized coins
- Various items - some that can be shaped into a circle and some that can't
- Journal to keep work in
- Circle Chart
- Coffee filters

Anticipatory Set/Introduction:

1. Prior to the lesson, bury a variety of coins into a pile of sand that will be placed into large sand containers.
2. Students will find the coins by digging through the sand containers. Once the students have located all the coins, have them separate the coins by different sizes and send them back to their seats.

Instructional Procedures:

1. Lead the students into discussion of circles by telling them the definition of a circle; a round figure bound by a single curved line where each point is equally distant from the center of the circle.
2. Ask the students which object they believe a coin to be. Ask questions such as what are the objects you found called? Tell me more about these shapes. What geometric shape do we call these objects?
3. Once the students understand that coins are circles, continue to ask them about the coins. Find out their understanding of coins, why they are sized differently, and why they are different looking.
4. Place the students into small groups and hand them several different objects. Some that are shaped into a circle and some that are not shaped into a circle.

5. Provide the groups with a large chart to complete the activity. The chart will be labeled on two different sides. One side being "these objects make a circle" and the other side being "these objects do not make a circle."
6. Students will look at each individual object and paste them onto their particular side of the chart. If the item is thought of as being circular the students will place it on the circular side. If the item does not make a circle it will go on the opposite side of the chart.
7. Groups will share their charts with the class once all groups have completed their charts.

Evaluation/Assessment:

1. Students will complete a lesson in their journals by gluing a coffee filter onto their page and writing the definition of the word circle underneath the coffee filter.
2. For homework, students will complete the circles handout provided for them after the lesson has been completed.
3. Evaluation will also consist of participation, following directions and completion of chart with their groups.

Lesson 5: Rectangles

NCTM Standard:

Standard 9: Geometry and Spatial Sense

- describe, model, draw, and classify shapes
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- develop spatial sense
- recognize and appreciate geometry in their world

Pennsylvania Content Standards Grade Level Benchmarks:

- 2.9 Geometry A. Identify and label two-dimensional shapes
- 2.9 Geometry B. Construct and reproduce a two-dimensional shape
- 2.9 Geometry C. Draw two-dimensional geometric shapes
- 2.9 Geometry D. Name and describe two-dimensional geometric figures in real life

Objective(s): Prior to the completion of this lesson:

- Students will be able to identify, recognize, and create a rectangular shape.
- Students will be able to correctly form the American flag out of a variety of materials provided for them and will also be able to name one historical fact about America.

Materials:

- Journal to keep work in
- 6 ½" by 11" white rectangle
- 4" by 5" blue rectangle
- 1/2" by 11" red rectangular strips
- Small Star Stickers
- Glue
- Toothpicks
- Charts on squares, triangles, and circles
- Magazines

Anticipatory Set/Introduction:

1. Have the students recite the Pledge of Allegiance once again, just like they do every morning before class starts.
2. Ask the students the significance of this pledge and tell them that this is our way we can promise to be true to our great country
3. Ask them what shape the American flag is, hoping they think it is square as well as the correct answer, a rectangle.

Instructional Procedures:

1. Review the previous lessons on the square, triangle, and circle before going into the rectangle.
2. Provide two square patterns for each student in your classroom.
3. Ask the students about the shapes they have just received, telling them to put them together and asking them what they see once they do that before telling them that this shape is a rectangle.

4. Ask the students to look around the classroom to find other objects that are shaped like rectangles.
5. Once a student finally states that the American flag is shaped like that (from the Anticipatory Set), start discussing the history of the American flag to the students.
6. Have students create a flag using red, white, and blue paper that will be provided to them around the classroom. They will create their flags in small cooperative groups, and place the stars on the flags with the stickers that you will have provided for them as well.
7. Have students present their flags to the classroom and giving one fact about the history of America from the discussion we held earlier.
8. Place students back to their tables to cut out pictures from magazines and place them on a "rectangles" chart, similar to the charts of the other objects in previous lessons.

Evaluation/Assessment:

1. Students will create a rectangular object in their journal out of toothpicks. Underneath their rectangular creation, they will write the definition of the word rectangle; a four-sided plane figure with four right angles.
2. For homework, students will complete the rectangles handout provided for them after the lesson has been completed.
3. Evaluation will also consist upon participation, following directions, and successful completion of the American flag with their group members.

Lesson 6: Reviewing Rectangles and Circles

NCTM Standard:

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Pennsylvania Content Standards Grade Level Benchmarks:

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Objective(s): Prior to the completion of this lesson:

- Students will be able to identify and create a rectangle and a circle.
- Students will be able to use terms of direction and relative positions.

Materials:

- Three various sized rectangles for each child in the classroom
- A circle for each child in the classroom
- Paper
- Crayons
- Flash Cards with terms of direction and relative positions on them
- One cut-out rectangle figure for each child
- One cut-out circle figure for each child

Anticipatory Set/Introduction:

1. Have the students stand from their seats and come to the front of the classroom.
2. Tell the students that they will be teaming up with a partner to do a variety of movements.
3. Once they have all found a partner, ask them to do a variety of different movements
 - “Move On/Under/Below” your partner
 - “Move Between” another group of two
 - “Stand Next to/ Beside” another group of two
 - “Stand Far From” your partner
 - “Stand Near” your partner
 - “Stand Above/Sit Below” your partner
 - “Move to the Right/Move to the Right” of your partner
4. This will introduce the students to terms of direction and relative positions for what they will need to know for the activity at hand.

Instructional Procedures:

1. Review all the previous lessons, going into each one very briefly to refresh your students' memory.

2. Walk around and collect many rectangular and circular objects around the classroom. Place these items into a rectangular shoebox.
3. Stand in front of your class and take out your collected items one-by-one. Ask the students to place them into two piles, items that are rectangles and items that are circles.
4. Pass out cut-out rectangular and cut-out circular objects to your students.
5. Shuffle your flash cards with the directional words on them as the students all come up front to get one rectangular object and one circular object from the front of the classroom.
6. Start reading the flash cards one by one to your class, having them do what the card tells them to do with the objects and cut-outs they have received.
 - Examples include, place the circular object **above** the rectangular cut-out, place the rectangular object **to the left** of the circular cut-out, place the rectangle cut-out **over** the circular cut-out, and place the circular cut-out **between** the rectangular object and the rectangular cut-out.
 - There are numerous other things these flashcards can make your students do with the objects and cut-outs.
7. Have students go back to their seats, picking up 3 different sized rectangles, one circle, a piece of paper, and glue from the front of the classroom.
8. Tell students to get out their crayons and a pencil and wait for further instruction.
9. Pass out two different flash cards to each student in your class and have them create what is written on their cards with the shapes in front of them.
10. Walk around to make sure your students understand what they are doing before they share their work for the classroom, reading the flash cards they have received once it is their turn to share.

Evaluation/Assessment:

1. Students will be given their final homework assignment for this unit, completing a drawing with all the shapes in them. They will draw these shapes onto their handout themselves and then have their parents find the shapes after they have finished their drawings.
2. Students will be informally evaluated on their participation, following directions, discussion, and completion of flash card assignment.

Lesson 7: Congruency

NCTM Standard:

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- 2.9 Geometry C. Draw two-dimensional geometric shapes

Objective(s): Prior to the completion of this lesson:

- Students will be able to identify shapes that are congruent with each other.
- Students will be able to construct a graph.

Materials:

- A Butterfly Pattern from the Symmetry lesson
- Numbered Grid
- Example of an already completed grid with colors
- Crayons
- Construction Paper

Anticipatory Set/Introduction:

1. Get out a Butterfly Pattern from the previous lesson and fold it in half.
2. Ask the students to locate the line of symmetry for them and cut along it to prove that they were correct.
3. Ask the students if these two shapes are the same. Once they proceed to agree they are the same, explain to them that they are the same because they are congruent.

Instructional Procedures:

1. Prepare several different shapes made from construction paper. Cut them out for your students before the lesson begins.
2. Tape these shapes on the chalkboard, with some of the shapes being the same size and the same shape, while others not being the same size and shape.
3. Have students come up in small groups to locate which shapes are indeed the same size and the same shape. Once all groups have one congruent shape, send them back to their seats and write down the word congruent on the chalkboard, explain its definition; two figures that have the same size and same shape.
4. Review the definition that you just given your students by asking them what makes their shapes congruent in which they have taken off the chalkboard. Once they have answered that their shapes have the same size and the same shape, you know they have understood the definition.
5. Pass out blank grids to all of your students and then display a blank grid on the chalkboard for your own use.

6. Place colors on your grid while calling out where those colors are placed on your own grid. For example, if you place a color on the number 3, tell your students that they should place the same color on the number 3.
7. Discuss why the student's pictures are congruent to their neighbor's pictures, and then discuss as a whole why everyone's pictures are congruent to the teacher's.

Evaluation/Assessment:

1. Students will be evaluated on their participation in the lesson, following directions, and completing the graph properly.
2. Students will be notified on their test on shapes and told to study for this test for the following day.

Unit Assessment

Name _____

Directions:

Color all of the triangles in the picture **green**. Color all of the squares in the picture **red**. Color all of the rectangles in the picture **blue**. Color all of the circles in the picture **purple**.

