

**Ray Holt**  
**EDSE 652**  
**Common Core Lesson Plan**  
**Mathematics – Geometry**  
**Lafayette High School, Oxford, MS, Mrs Smith, Room 20, 10:49am -11:40am.**

This is a Geometry class which consists of 19 students, 8 in 9<sup>th</sup> grade students, 2 in 10<sup>th</sup> grade, and 9 in 11<sup>th</sup> grade. The class consists of 13 boys and 6 girls. Two students are enrolled in a Resource Class for extra help. In general, the class is weak in basic math. I will be forming Learning Groups during this lesson; four groups of four and one group of three. There are very few strong students in this class so I will let each group select a Group Captain that will represent the group. This lesson is intended to give the students a needed practical review of area and perimeter of various geometric shapes by treating the shapes separate as well as combined into a more complex shape.

This lesson will be on calculating the area and perimeter of complex geometry figures. Figures will be formed from previously made cutouts made from heavy gauge poster paper. A previous lesson will teach/review area and perimeter of a square, rectangle, triangle and circle. This lesson will combine these shapes into one shape. The student will be taught to treat the complex shape as individual shapes that combine to become a whole.

**Content Standards:**

Common Core

Grade 7. (3) Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three dimensional objects.

Geometry 7.G Draw, construct, and describe geometrical figures and describe the relationships between them including computing actual lengths and areas from a scale drawing. Solve practical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

Mathematical Practices

1. Make sound reasoning and sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Apply geometric concepts in modeling mathematics.
4. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.

**Establishing Inclusion:**

The Learning Groups of four will include all students in the learning process. I will assign specific duties to all students. In each group one will be the Group Captain, one the Shape Captain, one the Formula Captain, and one the Calculator Captain. These will be the duties of the Captains:

Group Captain: To oversee and to report to the class their conclusions.

Shape Captain: To form the required shape using the cutouts.

Formula Captain: To determine which formulas to apply to solve the problem.

Calculator Captain: To perform the calculations necessary to get the answers.

The Captains are encouraged to seek help from within their group but will be responsible for the final decision concerning their responsibility.

### **Developing Attitude:**

During my lesson introduction I will include several shapes of various sizes. These individual shapes will be combined by the Groups to form the solution to a written problem. I will emphasize in the problems matching different sides of shapes to form a greater complex shape.

### **Enhancing Meaning:**

I will be interacting with the students at several places in the lesson. After introducing the written problem I will give the groups a few minutes to form their complex shape. Then the Group Captain will explain to the entire class their chosen shape. Next the Formula Captains will be given a few minutes to determine the appropriate formulas necessary to solve the problems. The groups will then be given about 10 minutes to come up with the solutions. Solutions will include area and perimeters of the complex shapes. The Group Captains will then be given the opportunity to make a final report. All problems will be based around real-world situations.

### **Engendering Competence:**

During the in-class exercises I will be able to walk the room and see how the students are doing on the various problems. Students know to work within their Learning Groups and for each member to help each other. If all Learning Center members are confused and need help then they raise their hands. During the group time the students will be formulating a solution to the written problem using squares, rectangles, triangles, and circles. During this time I will be able to measure their competence to the material and to reinforce any confusion.

### **Learning Objectives:**

Students should be able to recognize various basic geometrical shapes (square, rectangle, triangles, and circles).

Students should be able to recognize the different parameters of a square, rectangle, triangle, and circle; such as, radius, diameter, circumference, side, height, width, and base.

Students should know how to calculate area and perimeters of square, rectangle, triangles, and circles.

Students should be able to connect simple geometrical shapes to form more complex shapes.

### **Assessment Strategy:**

There will be several places during the lesson where I will be able to assess the students. During the bell ringer exercise I will be able to observe the student work. During my example problems on the board I will be asking questions. During the in-class exercises I will be observing and asking questions. Students will also be asking questions to each other in their groups. If an entire group can't help each other then they can ask a group question. All of these places in the lesson I will be able to assess if the students are learning the basic geometric shapes, parameters, formulas, and calculations. If I sense they are weak on one aspect of the lesson I will be able to reinforce the lesson at that time.

### **Description of Lesson Flow:**

When the students enter the room they will be asked to form groups by rearranging their chairs. They will be allowed to form a group of four with any other three students. Each group will be handed a review exercise as an assessment. There will be questions on identifying shapes and formulas. Questions will be multiple choice or identification. This is expected to take five minutes after the bell rings. Next I will demonstrate connecting several shapes to form a new complex shape. I will ask questions on area and perimeter. I will perform the calculations of area and perimeter of a complex shape. This should take ten minutes.

Next each student group will be given a handout with a word problem exercise. This word problem will ask them to use the cutout shapes and to form a complex shape. The exercise will be in three steps. a) form the requested shape, b) determine the formulas necessary to answer the problem, c) calculate the requested answers. At the completion of a), b), and c) the group captains will be asked to explain to the class their findings. This should take 20 minutes. Next I will give the class opportunity to ask questions and if necessary to show any shapes and formulas that might not be understood.

A second exercise will be handed out. This will be given to each student but they will be asked to work in their groups and to help each other. This exercise will be a type of maze in which the students will be asked to determine various area and perimeter calculations. If they do not complete it in class or time runs out they will be allowed to take it home and complete.

### **Materials:**

Objects: Poster board paper cutouts of various squares, rectangles, triangles, and circles.

Measuring Devices: Ruler (one per group)

Masking Tape

Handouts:

- a) Bell ringer review exercises.
- b) Written word problem exercises with questions to answer (to be handed in during class)
- c) Written 'maze' problem type for in-class and homework.

<b>Time</b>	<b>Activity</b>	<b>Anticipated Student Responses</b>	<b>Teacher Response</b>	<b>Justification</b>
10 min	Bell Ringer: Students will rearrange in groups of four and will work on a pre-assessment exercise covering area and perimeter of shapes.	I expect some students to be confused with the grouping. I do expect questions on the pre-assessment. I will encourage questions within the groups.	I will ask each group to try to answer any questions and if all students in a group do not know the answer I will work with the group towards the answer.	Students expect to have some activity when they enter the room. This helps them to get organized quickly and to be quiet.
10 min	Demonstrate combining shapes and calculating the area and formula.	Most students will understand and a few will ask questions.	Where necessary I will explain concepts, show formulas and calculations.	Concepts and formulas are the foundation of complex shapes.
20 min	Each group will be given a different written exercise. Each exercise will ask the group to form a shape, calculate the area and perimeter of the shape. Each group captain will be asked to explain their solutions.	I expect about 50% of the students to fully understand all concepts and 10% to not understand at all. The rest will know some answers. Learning Center teams will work together with stronger students helping weaker students.	I expect to explain some concepts and formulas to each group.	My purpose of this exercise to teach the students to reason a word problem and to make sense in forming a geometry shape from the word problem and to teach how to calculate area and perimeter of these shapes.
10 min	Each group will be given a 2 <sup>nd</sup> exercise. This exercise will be a maze of various shapes. The students will be asked to calculate the area and perimeter of the maze shape.	A few students to be confused with radius and diameter and the diagonal, however, I expect most will have not problems. Some will still be confused on area and perimeter.	If necessary I will show the formulas for the area and perimeter for the various shapes, however, I will first make sure the group cannot answer these questions.	Working examples will help the students understand the relationships between the various groups formulas.
2 min	Homework: Students are given a set of review problems for homework. These problems will review their knowledge in calculating area and perimeter of basic shapes. A few problems will combine shapes into complex shapes.	Most students will be able to do this exercise and will bring it back completed or tried. Some will ignore doing the homework and 2 or 3 will have lost it and never tried.	Those that have not completed the assignment will be assigned to the class tutor or help or will try it again as homework.	Students learn the application of various geometric shapes, their areas and perimeters.