

**GED 2002 Teachers' Handbook of Lesson Plans**

<p><b>Content Area</b> Mathematics</p>	<p><b>Lesson Topic/Theme</b> Geometry Using Manipulatives and Games</p>	<p><b>Correlation to Math Framework</b> 05.05/05.16</p>	<p><b>Lesson Number - 44</b></p>
<p><b>Title: Marshmallow Geometry</b> <b>Objectives/Learner Outcomes</b></p> <p>At the end of this lesson, the learner will be able to:</p> <ul style="list-style-type: none"> <li>• Identify the two-dimensional geometric shapes: rectangles, squares, triangles, parallelograms, and trapezoids</li> <li>• Draw or create a two-dimensional rectangle, square, triangle, parallelogram, and trapezoid</li> <li>• Define the following words: rectangle, square, triangle, parallelogram, trapezoid, angle, and side</li> <li>• Compare and contrast geometric shapes</li> <li>• Design a structure using geometric shapes</li> <li>• Relate geometric shapes to everyday life</li> <li>• Relate the information to the GED Mathematics Test</li> </ul>		<p><b>Materials/Resources/Internet Sites/Handouts/Worksheets</b></p> <ul style="list-style-type: none"> <li>• Small marshmallows</li> <li>• Large marshmallows</li> <li>• Wooden skewers</li> <li>• Straws</li> <li>• Paper plates</li> <li>• Newspaper</li> <li>• Handout #1 - <b>Geometry Match Activity</b></li> <li>• <b>Handout #2 - Geometry Match Answer Key</b></li> <li>• Board and chalk or paper and markers</li> </ul>	
<p><b>Pre-Requisite Knowledge</b></p> <p>The learner should be able to:</p> <ul style="list-style-type: none"> <li>• Read and pronounce the words: rectangle, square, triangle, parallelogram, trapezoid, angle, and side</li> <li>• Explain how geometry is used in everyday life</li> </ul>		<p><b>Key Words</b></p> <ul style="list-style-type: none"> <li>• Rectangle</li> <li>• Square</li> <li>• Triangle</li> <li>• Parallelogram</li> <li>• Trapezoid</li> <li>• Angle</li> <li>• Side</li> </ul>	
<p><b>Anticipatory Set/Introduction</b></p> <p><b>Say:</b> Today's lesson is called <b>Marshmallow Math</b>. What do you think marshmallows have to do with geometry?  <b>Ask:</b> Where do you see a rectangle in this room? A square? A triangle?  <b>Ask:</b> Do you see a parallelogram? A trapezoid?  <b>Ask:</b> Why would you need to know about geometric shapes?  <b>Discuss:</b> The GED Mathematics Test requires knowledge, comprehension, application, and analysis of geometric shapes. Builders, engineers, and landscapers need this type of knowledge. In your everyday life, you also need this type of knowledge when buying things such as carpet or tile or just in following directions.</p>			

### Preview Questions for Lesson

**Say:** I need a volunteer to draw a square on the board.

**Ask:** What makes this a square?

**Say:** In this lesson, you will learn to identify, define, and draw a rectangle, square, triangle, parallelogram, and trapezoid. You will learn how the shapes are the same and how they are different. Also, we will talk about how we use geometric shapes every day.

### Instructional Outline

**Say:** Look at the board as I show you these geometric shapes. (See *Geometry Match! Answer Key* handout for more details.)

**Do:** Draw a square on the blackboard.

**Ask:** How many sides are there? Are all of the sides the same length?

**Say:** A square has four angles. An angle is composed of two lines that meet. These are the four angles.

**Do:** Draw two parallel lines on the board.

**Say:** These lines are parallel. No matter how long I make them, they will never meet or cross each other. Demonstrate that railroad tracks have parallel characteristics.

**Ask:** Which lines in a square are parallel?

**Say:** A square has two pairs of parallel lines.

**Ask:** Do you see another shape on your paper that has lines that are parallel?

**Say:** Yes, a rectangle has parallel lines. Does it have angles?

**Do:** Draw a rectangle on the board and discuss its characteristics.

**Ask:** How is the rectangle different from the square?

**Do:** Use this question/answer technique for each shape. Discuss the angles and parallel lines, comparing and contrasting each shape.

## Process/Activities

### Marshmallow Activity

*Objective:* Students demonstrate an understanding of the two-dimensional geometric shapes: rectangle, square, triangle, parallelogram, and trapezoid.

- Students can work in groups.
- Give each group a bag of small marshmallows and wooden skewers.
- Each group should make the five geometric shapes discussed during the lesson.
- Each shape should be presented on a piece of paper.
- On a piece of paper, write the definition and characteristics of the shape.
- Check the students' work for accuracy.
- Close with a class discussion about the characteristics of each shape. Have students compare and contrast the shapes.

### Geometry Match!

*Objective:* Provide individual assessment of a student's ability to identify and define a rectangle, square, triangle, parallelogram, and trapezoid.

**Do:** Print the handout. Cut out the shapes and definitions and place them in an envelope. Provide one envelope per student.

**Say:** We are going to see how well you can match the definition to the shape. See if you can be the first student to complete **Geometry Match!** When you are finished, let us know by saying aloud - **Geometry Match!** Check for accuracy.

## Product/Evaluation/Summary

### Marshmallow Building

*Objective:* Working together as a group, build the tallest structure using as many of the five geometric shapes as possible.

*Materials:* Ten straws, twenty marshmallows, one paper plate, and a sheet of newspaper

*Directions:*

- Divide students into groups of three to five.
- Give each group the following materials: ten straws, twenty marshmallows, one paper plate, and a sheet of newspaper.
- **Say:** I have given you ten straws, twenty marshmallows, one paper plate, and a sheet of newspaper. It is your job to make the tallest structure that you can with these materials. Use as many of the geometric shapes as you can. You have ten minutes to meet the objective using only the materials provided.
- Each group presents their structure. The group tells about the shapes used to erect the structure, how many shapes they used, and which shapes they believed made their structure the tallest or not the tallest. The group can also say why they believe their structure is the best if it is not the tallest. Each student should have a speaking part.

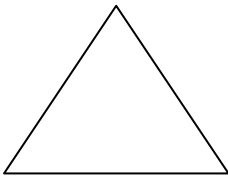
<b>Teaching to Different Types of Learners</b>			
	<b>Visual</b>	<b>Auditory</b>	<b>Kinesthetic/Tactile</b>
<b>Learning Activity</b>	Have students create shapes using M&Ms™. Each shape should be made using a specific or predetermined color.	Have students work in pairs to discuss the characteristics of each shape.	Have students create shapes using M&Ms™.
<b>Special Differentiation Strategies</b>	Use an overhead transparency to visually show all shapes when teaching the lesson. Color-code the shapes and definitions on the transparency and handout.	Check for understanding orally and by asking questions when giving directions or assignments, especially those that are in writing.	Cut large shapes out of felt. Stick the shapes on the board as you are instructing.
<b>Evaluation</b>	Allow students to show mastery by drawing geometric shapes while you write the names of them on the board. You can alternate the requirement of writing the names of the shapes and drawing the shapes.	Have students orally report what they have done.	Assessment of learning can be in written form or through games that use student-made manipulatives.
<b>The Family and Adult Literacy Connection</b>		<b>ESE/ESOL Accommodations</b>	
<p>If students have school-aged children, have the students bring the handout home. Children can color the shapes, cut out the shapes, and/or find examples of the shapes around their home (e.g., a book, a wall, a rug, or the TV remote).</p> <p>Students can associate shapes to their every day lives. Knowing the characteristics of these shapes will translate into learning perimeter, area, and volume for such activities as buying, groceries, rugs, picture frames, and fertilizer, or following a recipe or creating a garden.</p>		<ul style="list-style-type: none"> <li>• Take time to review the correct pronunciation of vocabulary words</li> <li>• Work in smaller groups</li> <li>• Allow extended time for discussion and completion of the activities</li> </ul>	

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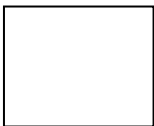
**Handout #1  
Geometry Match!**



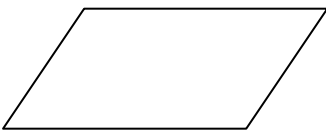
**Parallelogram:** a four-sided figure with two pairs of parallel sides. The opposite sides have equal length.



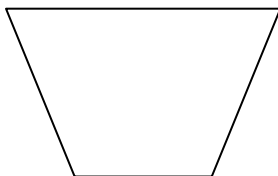
**Trapezoid:** a four-sided figure with one pair of parallel sides.



**Triangle:** a three-sided figure with three sides and three angles.



**Square:** a four-sided figure with two pairs of parallel sides and four right angles.



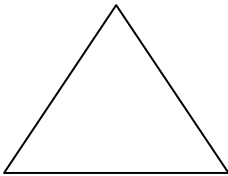
**Rectangle:** a four-sided figure with two pairs of parallel sides and four right angles

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**Handout #2  
Geometry Match! Answer Key**



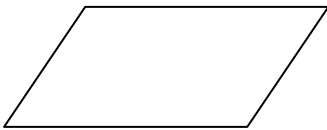
**Rectangle: a four-sided figure with two pairs of parallel sides and four right angles.**



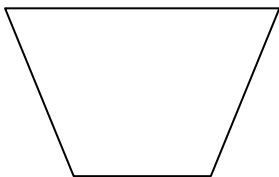
**Triangle: a three-sided figure with three sides and three angles.**



**Square: a four-sided figure with two pairs of parallel sides and four right angles.**



**Parallelogram: a four-sided figure with two pairs of parallel sides. The opposite sides have equal length.**



**Trapezoid: a four-sided figure with one pair of parallel sides.**