

Michelle Dale  
7<sup>th</sup>/8<sup>th</sup> Grade Math  
Area Lesson – Geometer’s Sketchpad

**Mathematical Concept:**

- Students will use the *Geometer’s Sketchpad* program to plot points on a graph and compute the area of an irregular shape.

**Standard 3 - Mathematics:**

- Key Idea 1: Mathematical Reasoning
- Key Idea 3: Operations
- Key Idea 4: Modeling/Multiple Representation

**Materials:**

- Area Worksheet (attached)
- Computers (with *Geometer’s Sketchpad* program)

**Objectives:**

Using *Geometer’s Sketchpad* the students will:

- Plot the given points.
- Connect line segments between the points to make an irregular shape (house).
- Break the irregular shape (house) into smaller shapes that have known area formulas (triangle and rectangle).
- Calculate the area by hand using known area formulas (triangle and rectangle) then check their work.
- Apply their knowledge of area and add together the areas of the smaller shapes (triangle and rectangle) to find the total area of the irregular shape (house).
- Describe in their own words the process of finding the area of an irregular shape and when this process might be used in everyday life.

**Vision:**

- **Teacher’s Role**  
After the students have learned how to find the area of triangles and rectangles and how to use *Geometer’s Sketchpad*, they will use this knowledge to find the area of an irregular shape. In this case, it is a simple shape, a house. After an introduction to the use of *Geometer’s Sketchpad*, the teacher will lead the students through steps 1-6 on the area worksheet by modeling on a screen. As they move through the steps, the teacher will ask students questions and assist students as necessary. After completing steps 1-6, the teacher will instruct the students to complete steps 7 and 8 on their own or by quietly discussing with a person seated next to them. The students will be asked to share answers and print out a copy of their completed house to hand in.

- Student's Role

The students will use and expand upon their knowledge of area throughout this lesson. The students will follow along with the area worksheet as well as the teacher's instructions. The students will be expected to participate in a class discussion as the teacher and students come to an understanding together. Each student will plot the points, create the segments, create interiors of a triangle and rectangle, and calculate the area of each shape by hand using the formulas. They will then use *Geometer's Sketchpad* to check the areas that they calculated. The students will then use their knowledge of area to add together the two areas to find the area of the irregular shape (the house). They will print out a copy of their completed house to hand in. They will then finish steps 7 and 8 independently or with assistance from someone seated next to them. The class will then share and discuss answers.

Name \_\_\_\_\_

Date \_\_\_\_\_

## *Finding the Area of an Irregular Shape*

**Follow the directions to create and find the area of a shape using Geometer's Sketchpad.**

1. Plot the following points:

A (-5, -4)

B (5, -4)

C (5, 1)

D (0, 6)

E (-5, 1)

2. Construct four line segments:

$\overline{AB}$ ,  $\overline{BC}$ ,  $\overline{CD}$ , and  $\overline{DE}$

3. You have now made the outline of a house. Can you find the area of this house? Why or why not?

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4. Do you see any other shapes inside the house that we can find the area of? List them. What happens when we construct a segment from point C to point E?

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5. Using the area formula's we already know, find the area of triangle CDE and rectangle ABCE.

Area of triangle CDE \_\_\_\_\_

Area of rectangle ABCE \_\_\_\_\_

6. Now let's check your work. Create interiors for triangle CDE and rectangle ABCE. Change the color of each shape that you construct.
7. Find the area of each interior that you created. Check these with the areas that you calculated. Drag the area into each shape.

Area of triangle CDE \_\_\_\_\_

Area of rectangle ABCE \_\_\_\_\_

8. What can we do with the areas that we found? Are we able to find the area of the house now?

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9. In your own words describe the process we used to find the area of an irregular shape (the house). When might we use this concept in everyday life?

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\*Be sure to print out a copy of your completed house to hand in\*

<b>SCORE</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Participation in Activity</b>	-Student actively and cooperatively participates in activity	-Student passively participates in activity	-Student needs to be reminded to stay on task during activity	-Student does not participate in activity
<b>Finding of Area</b>	-Student successfully finds the area of each smaller shape and the irregular shape	-Student finds the area of the irregular shape with minor errors	-Student has many errors in the finding of area	-Student does not find the area
<b>Completion of Worksheet</b>	-Worksheet is entirely complete -All answers are correct	-Worksheet is entirely complete -One answer is incorrect	-Worksheet is only partially complete -A few answers are incorrect	-Worksheet is incomplete -Most of the answers are incorrect