Math

Plot-a-Lot

Grade Level
3-6

Length of Lesson
45 minutes

Objective
By the end of this lesson, students will be able to plot and calculate the area of geometric shapes based on a scale.

Materials Needed
- Rulers
- Copies of student worksheet
- Graph paper
- Calculators (optional)

Standards
Common Core Math
CC.3.OA.3; CC.3.MD.5-8; CC.5.MD.2-4; CC.6.G.1

Lesson Summary
This lesson is designed to help students strengthen their math skills by plotting shapes and calculating their perimeters and areas.

Suggested Sequence of Events:
1. Read *The Pig War* by Emma Bland Smith to capture student interest.
2. Read through our AITC Ag Mags that tie with this activity to learn more about those commodities.
3. Complete the activity following the procedures:
    - Review how to calculate area with your students. Make sure students label using the correct measurements.
    - Next, review how to calculate perimeter with your students. Again, make sure students are labeling with the correct measurements.
    - Keep the review up on the board as a guide for students as they complete their work.
    - Hand out the student worksheet and a piece of graph paper.
    - Read through the directions together and then give students time to work.
6. Whole class discussion and reflection of activity.

TEACHER RESOURCES

Background Information:
In the early days of America, land was divided in many different ways that caused a lot of arguments over what land belonged to which person. The Land Ordinance of 1785 created a standard way of plotting and dividing government land. Unsettled territory was divided into a 6-mile square, called a township. The township was further divided into 36 sections, each measuring 1 square mile, or 640 acres. At first, settlers had to buy an entire section if they wanted to own land!

Farmers both then and today must also decide how to divide their land to make the best use of it on their farms. Some land is best used to grow crops, and other land is best used to raise livestock. In some cases, farmers must build fences to contain their animals, keep them safe from predators, keep them close to food and water, and keep them from wandering into fields and eating the crops. Sometimes the needs of a farm changes and the land must be divided in a different way to make the farm more productive. This activity asks students to think like a farmer and plot-a-lot!

Extension Ideas:

- Farmers raise and harvest their commodities for profit. Have students calculate their farm's earnings based on the information below. Does this change how they would plot their farm? See if they can re-plot their farm to make the most money while still using the rules from their worksheet.
    - Corn: earn $2 for every 5 units^2
    - Soybeans: earn $1 for every 2 units^2
    - Cattle: earn $5 for every 10 units^2
    - Pigs: earn $3 for every 6 units^2
- Read through our Corn, Soybean, Beef, and Pork AG Mags to learn more about farming different commodities.
- Students could experiment with spacings of seeds and grouped seeds to calculate the ideal spacing by completing our "DIY Seed Tape" activity.
    - Ask your students if there are ways to use less space but still plant the same amount of seeds. Then introduce "Square Foot Gardening," a popular garden spacing method.
- Have students design a cattle and/or pig barn. What do these animals require to stay healthy?
- Use our "Play-Doh Core Sampling" activity to learn more about soil types. Why is it important to test the soil before plotting a commodity?
- Go to agintheclassroom.org to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!

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Student Worksheet

Think like a farmer and try to figure out the best use of space on your farm! Some land is best used to grow crops, and other land is best used to raise livestock. Other land must be used to build homes, sheds to store farm equipment, and many other uses. To create the most productive and efficient farm, you have to "plot-a-lot"!

Plotting Directions:

1. On your graph paper, 1 square = 1 unit. Draw a rectangle that is 20 units by 30 units. This space represents all the land you own.
   What is the total area of land you own? _____ units^2.
2. You need a house to live in. Somewhere on your land, draw a plot for your house that has is 3 units by 3 units. Label your house.
3. With the remaining space, plot and label the areas where you will raise cattle, raise pigs, grow corn, and grow soybeans. You can plot as much space as you like for each commodity as long as it fits on your land. You must plant all four commodities following the rules below:
   A. Commodity plots cannot overlap, or overlap with your house.
   B. All plots must use only use vertical and horizontal lines, no diagonal.
   C. Your cattle plot must have an area of **at least** 50 units^2.
   D. Your corn plot must have a **length** of at least 10 units.
   E. Your soybean plot must have **equal length and width**.
   F. Your pig plot must have a perimeter of **exactly** 32 units.
4. Complete the chart below with the measurements of each commodity plot:

Commodity	Length (units)	Width (units)	Perimeter (units)	Area (units^2)
Corn				
Soybeans				
Cattle				
Pigs				