

Building Mathematical Thinkers: Mini-Activities

Area Creatures

Objective: 4th grade Measurement – Area & Perimeter

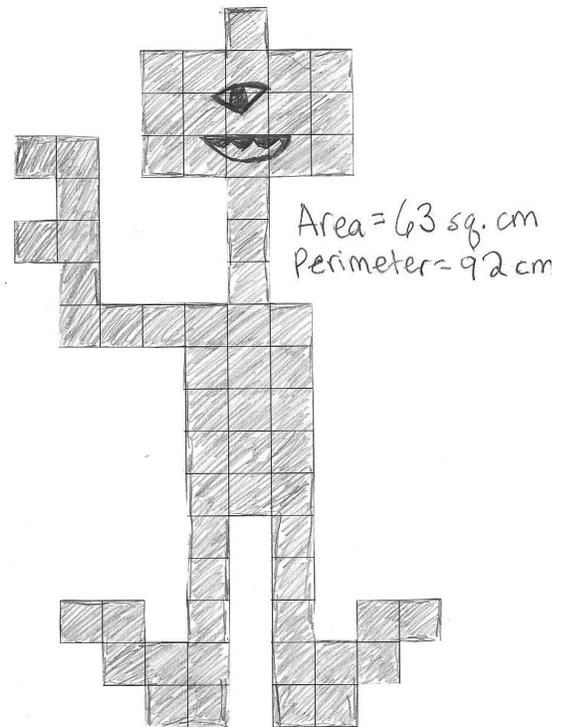
Theoretical Foundation: Students use problem solving to practice methods for finding area and perimeter on a grid. In this activity they draw an invented creature on grid paper that meets certain requirements and then record the area and perimeter of the creature. This activity provides an excellent opportunity to discuss difficulties they encounter, how they solve them, and ways that area and perimeter are related.

Estimated Time: 45-60 minutes

Materials: Centimeter grid paper (one sheet per student), light-colored construction paper for mounting, scissors, crayons or colored pencils

Description:

1. Tell students that they will be using area and perimeter to invent brand new creatures. This would be a great time to share an example that you have made.
2. Model how to create a new creature on the grid paper (you may want to use an overhead and grid paper on transparency for this). Point out that you are only using straight lines that follow the grid.
3. Show students that you have included at least one arm, one leg, and one head for your creature.
4. Invite students to guide you through finding the area of your example creature. Write this measurement near the example
Area= ____ square cm
5. Invite students to guide you through finding the perimeter of your example creature. Write this measurement near your example - Perimeter= ____ cm
6. Tell students that their task is to create a creature that meets all of these criteria (list on the board):
 - * At least one arm
 - * At least one leg
 - * At least one head
 - * All body parts must be at least one full centimeter wide
 - Area must equal exactly 63
7. Distribute grid paper and encourage students to start working on their creature.
8. When a student feels confident that their creature meets all of the criteria they should add details and color their creature, then cut it out and paste it on construction paper
9. Students should, then, write the area and perimeter of their creature somewhere on the construction paper: Area=63 square cm, Perimeter= ____ cm
10. After students have finished working, talk about their experience - *see probing questions*



Differentiation Suggestions:

- *Before the lesson* create an example to show the students. This often helps jump start their creativity and

provides a concrete way for them to see how area and perimeter relate to creating creature and will make the modeling aspect of the activity easier for the teacher.

- Most students would benefit from having the teacher check their creature to see if it really has an area of 63cm squared before they color and cut. The teacher should briefly meet with each student and have the student prove that the area is correct.
- For advanced students or those who finish early, challenge them to create a new creature with the same criteria except that instead of a set area there is a set perimeter of 125.

Probing Questions:

- What made this task difficult?
- What strategies did you use when you encountered a difficulty?
- Imagine that someone makes an arm that is 2 centimeter blocks wide, but they realize their area is too big so they want to shrink the creature's arm to one centimeter block wide. How will this affect the creature's perimeter? Which measurement is more affected by this change, the area or perimeter? Why is this the case?

Assessment:

- Listen as students explain how to find area and perimeter during the pre-activity and post-activity discussions. Are there any misconceptions or inconsistencies?
- Monitor and observe as students create their creature. Difficulties are expected, but are the students coming up with solutions on their own? How much guidance do they need?
- Use post-it notes to cover the area and perimeter of each creature. Ask students to find the area and perimeter of another student's work.

Centimeter Grid Paper for Area Creatures

