Mathematics: The Language of STEM

Perimeter
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CONTENT AND TASK DECISIONS

Grade Level(s): 3rd

Description of the Task: You are creating a playground for your dog. You need to put a fence around the dog playground. Your backyard is large enough to have a playground that has a perimeter no larger than 54 feet and not smaller than 32 feet.

Indiana Mathematics Content Standards: 3.M.7: Find perimeters of polygons given the side lengths or by finding an unknown side length.

Indiana Mathematics Process Standards: PS.2: Reason abstractly and quantitatively

Mathematics Content Goals: Perimeter

Language Objectives: Students will record possible perimeters for the puppy playground on a graph page with their partner. Then illustrate the puppy playground they want to build. They will then share their struggle, strategies, and solutions with the class.

Materials:

graph paper or plain paper
pencil
crayons or markers

THE LESSON

Before:

- **Activate prior knowledge:** Let's talk about perimeter! What do you know about perimeter? Turn and talk with your neighbor about what you know. What do we know about playgrounds? What type of equipment do you think a puppy might want on their playground? Would the equipment effect the shape of the perimeter?
    - **Sentence frames:** To find perimeter you would _____.
      I would put _____ in a puppy playground because _____.

- **Be sure the problem is understood:** Your family has a new dog and you want to make a special place for it to play when it goes outside. Your mom said you can create a fun play area for your new dog. You need to decide the shape that would be best for your playground based on the equipment you want your dog to have. Remember, due to the size of your backyard, the perimeter of the playground must be no larger than 54 feet and can't be smaller than 32 feet.

- **Establish clear expectations:**
    1. Work together to decide what equipment you want in equipment you want in the playground.
    2. Based on the equipment, create the shape and size for the perimeter of the playground.
    3. Record the playground and equipment on your paper.

During:

- **Let go:** Students will start trying different perimeters that fall within the criteria. When they decide on the shape of the playground they will then label where the equipment would go to make sure it all fits. Then they will make a poster display with the playground perimeter labeled and the equipment placed within the fence.

- **Listen actively:** As the students work, the teacher will listen for the partners to discuss the different possibilities for different shaped perimeters. Listen for them to talk about getting as different play equipment in the fence.

- **Provide appropriate support:**
  How did you decide which shape will be best for your dog?
  How many different perimeters have tried?
  How did decide what equipment your dog would like to have in the playground?
  What have you done so far?

- **Provide worthwhile extensions:**
  If you

After

- **Promote a mathematical community of learners**
  Partners will share their puppy playground in math congress. They will share the perimeter they have for their playground and the equipment they thought their dog would like in the playground. Tell the class the struggles you had to find the shape for the perimeter of your playground.

- **Listen actively without evaluation**
  How did you work together to decide what shape you would want for the perimeter of your playground?
  What was the most challenging part of creating the perimeter of your playground?
  How did you use teamwork to complete the project?

- **Make connections**
  What prior knowledge helped you create different perimeters that met the criteria?
  What tools or strategies did you use to keep track of the different shapes you created for the perimeter?
  How did addition and multiplication help you find different shapes within the criteria for the feet

available?
Where else in the "real" world would you need to know about perimeter? Give examples.

- **Summarize main ideas**
  Today you were able to use perimeter to help design the shape of your new dog's playground. You also had the opportunity to decide what type of equipment your dog might enjoy in the playground.

ASSESSMENT:

Observe:

Look for evidence that students see the connections between 2 x L + 2 x W.
Look at the evidence each group produced for their perimeter. Does it fall within the original criteria presented?

Ask:

How does addition and multiplication relate to finding the perimeter?