

Grade Level: Childhood (grades 4)

Standard: SR.C.7 Understand concepts of Geometric measurement: involving perimeter, area, and volume.

Performance Expectation: 4.MD.A.3: Apply the area and perimeter formulas for rectangles in the real world and mathematical problems.

Conceptual Understanding: Mathematical thinking involves analyzing relationships, systems, and structures.

Learning Intention: Understanding the relationship between area and perimeter.

Success criteria:

- **Knowledge:** I can calculate the area and perimeter for a variety of rectangles.
- **Process:** I can look for and make use of the structure of the given mathematical relationship to make connections between the different representations.
- **Process:** I can construct viable arguments and critique the reasoning of others based on the given mathematical relationship and connections that are made.

Task:

Participants/students work in small groups, on large wall chart paper to draw the rectangles described and answer the following questions: Note: participants/students may wonder/question if two rectangles are considered the same, for example a 3 x 8 and an 8 x 3. This is a great conversation that can connect to the real world, for example do you want a 3 x 8 window or an 8 x 3 window? Brings to bear the orientation of a shape can matter.

- How many different rectangles can you make with an area of 24 square units?
 - 1 x 24
 - 2 x 12
 - 3 x 8
 - 4 x 6
 - 6 x 4
 - 8 x 3
 - 12 x 2
 - 24 x 1
- What do you notice about the different rectangles?
 - They are not all the same
- What is the perimeter of each of the rectangles you have made?
 - Do they have the same perimeter?
 - 50 units

- 28 units
 - 22 units
 - 20 units
 - 20 units
 - 22 units
 - 28 units
 - 50 units
- How many different rectangles can you make with a perimeter of 24 units?
 - 1 x 11
 - 2 x 10
 - 3 x 9
 - 4 x 8
 - 5 x 7
 - 6 x 6
 - 7 x 5
 - 8 x 4
 - 9 x 3
 - 10 x 2
 - 11 x 1
- What do you notice about all the rectangles?
 - They are not all the same
- What is the area of each of the rectangles you have made?
 - Do they have the same area?
 - 11 square units
 - 20 square units
 - 27 square units
 - 32 square units
 - 35 square units
 - 36 square units
 - 35 square units
 - 32 square units
 - 27 square units
 - 20 square units
 - 11 square units
- What can you determine about the relationship between perimeter and area?
 - Area and perimeter are not fixed; you can have the same area with different perimeters and vice versus