

MA.4.GR.2.2

Overarching Standard: MA.4.GR.2 *Solve problems involving the perimeter and area of rectangles.*

Benchmark of Focus

MA.4.GR.2.2 Solve problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters.

Examples Possible dimensions of a rectangle with an area of 24 square feet include 6 feet by 4 feet or 8 feet by 3 feet. This can be found by cutting a rectangle into unit squares and rearranging them.

Benchmark Clarifications

Clarification 1: Instruction focuses on the conceptual understanding of the relationship between perimeter and area.

Clarification 2: Within this benchmark, rectangles are limited to having whole-number side lengths.

Clarification 3: Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit.

Clarification 4: Responses include the appropriate units in word form.

Related Benchmark/Horizontal Alignment

- MA.4.NSO.2.2/2.3/2.4/2.5
- MA.MA.4.AR.1.1

Vertical Alignment

Previous Benchmarks Next Benchmarks

MA.3.GR.2.3

MA.5.GR.2.1

Terms from the K-12 Glossary

- Perimeter

Purpose and Instructional Strategies

The purpose of this benchmark is for students to understand the relationship between perimeter and area. Students will explore situations where multiple

shapes have the same area and different perimeters and same perimeters and different areas. This benchmark supports the perimeter and area work in MA.4.GR.2.1.

- Instruction will help students begin to generalize that when working with rectangles with the same area, squares will have the smallest perimeter and the longer one side is, the greater the perimeter is going to be.

Common Misconceptions or Errors

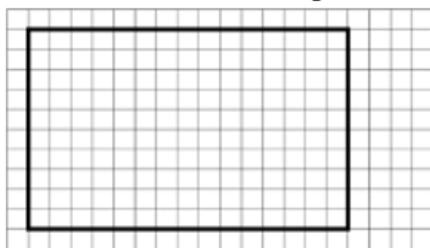
- Students may believe that a rectangle with a large perimeter must also have a large area.

Strategies to Support Tiered Instruction

- Instruction includes comparing figures with the same perimeter but different areas and the same area but different perimeters.
 - For example, students find the area and perimeter for figures created using grid paper making the connection that not all figures with a large perimeter have a large area.

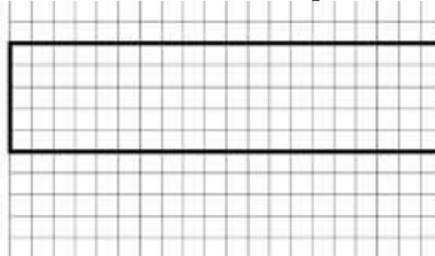
$$\text{Perimeter} = 15 + 15 + 10 + 10 = 50$$

$$\text{Area} = 15 \times 10 = 150 \text{ square units}$$



$$\text{Perimeter} = 20 + 20 + 5 + 5 = 50$$

$$\text{Area} = 20 \times 5 = 100 \text{ square units}$$



- Instruction includes providing several square tiles that can be arranged to make rectangular figures in many ways. Students build figures with the same area and calculate the perimeter.
 - For example, students use 36 tiles to make a figure that is 2 tiles by 18 tiles. They would calculate $\text{Area} = 2 \times 18 = 36$ square units, and then calculate $\text{Perimeter} = 2 + 2 + 18 + 18 = 40$ units. Students would then rearrange the tiles to create a rectangle that is 6 tiles by 6 tiles. They would calculate the $\text{Area} = 6 \times 6 = 36$ square units, and $\text{Perimeter} = 6 + 6 + 6 + 6 = 24$ units. Students compare the area and perimeter of both figures and make the connection that the area of a figure does not determine the perimeter.

Questions to ask students:

- Ask students: If I have a rectangle with an area of ___ what might be the different perimeters that rectangle could have?
 - Sample answer that indicates understanding: *The student will be able to label all 4 sides of the rectangle to match the given area and provide more than one example of an accurate perimeter for the rectangle.*
- As a follow up to the above question, what dimensions (Length and width) would create the greatest/least perimeter?
 - Sample answer that indicates understanding: *The student will provide an accurate length and width for the greatest and least perimeter of the given area.*

Instructional Tasks*Instructional Task 1*

Steve has 600 feet of fencing. He is trying to figure out how to build his fence so that he has a rectangle with the greatest square footage inside the fence.

Part A. What are the dimensions of the fence he can build with the greatest area inside? Part B. What is the area inside his fence?

Instructional Items*Instructional Item 1*

Skylar built a rectangular table for her doll house. The area of the table is 105 square inches and the side lengths are whole-number inches. What are some possible perimeters of the table?

- a. 26 inches
- b. 44 inches
- c. 52 inches
- d. 76 inches
- e. 210 inches

Achievement Level Descriptors

| Benchmark | Context | Assessment Limits |
|--|---------|-------------------|
| MA.4.GR.2.2 Solve problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters. Example: Possible dimensions of a rectangle with an area of 24 square feet include 6 feet by 4 feet or 8 feet by 3 feet. This can be found by cutting a | Both | N/A |

| | | | |
|--|--|--|--|
| rectangle into unit squares and rearranging them. Clarification 1: Instruction focuses on the conceptual understanding of the relationship between perimeter and area. Clarification 2: Within this benchmark, rectangles are limited to having whole-number side lengths. Clarification 3: Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit. Clarification 4: Responses must include the appropriate units in word form. | | | |
| ALD 2 | ALD 3 | ALD 4 | ALD 5 |
| solves problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters with whole number side lengths limited to one digit each using a visual model of unit squares. | solves problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters with whole number side lengths using a visual model. | solves problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters. | identifies an error and solves problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters. |

Additional Resources:

[CPALMS Resources](#)

Resources/Tasks to Support Your Child at Home:

[Comparing Area and Perimeter of Rectangles: Khan Academy](#)

[Area and Perimeter Games: Splash Learn](#)