

MA.3.GR.2.1

Overarching Standard: *MA.3.GR.2 Solve problems involving the perimeter and area of rectangles.*

Benchmark of Focus

MA.3.GR.2.1: Explore area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps. Find areas of rectangles by counting unit squares.

Benchmark Clarifications

Clarification 1: Instruction emphasizes the conceptual understanding that area is an attribute that can be measured for a two-dimensional figure. The measurement unit for area is the area of a unit square, which is a square with side length of 1 unit.

Clarification 2: Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form (e.g., square centimeter or sq.cm.).

Related Benchmark/Horizontal Alignment

- MA.3.NSO.2.2

Vertical Alignment

Previous Benchmarks

MA.2.AR.3.2
MA.2.GR.2.1

Next Benchmarks

MA.4.GR.2.1/2.2

Terms from the K-12 Glossary

- Rectangular Array

Purpose and Instructional Strategies

The purpose of this benchmark is to provide the foundation for students to understand area measurement. In Grades 1 and 2, students learned about linear measurement using number lines, rulers, and calculating perimeter. In Grade 3, students build on their knowledge of measurement and multiplicative reasoning to explore and understand area measurement. Instruction emphasizes that area is a two-dimensional measurement, therefore it is measured in units that are also two-dimensional – unit squares with side lengths that measure one unit. Area is calculated using unit squares that cover a shape without gaps or overlap (MTR.5.1).

- The expectation of this benchmark is for students to calculate area of rectangles by **counting** unit squares (MTR.2.1).
- Instruction allows for students to draw conclusions about connections to arrays and to determine more efficient counting strategies for calculation, leading to the use of a multiplication formula in 3.GR.2.2 (MTR.4.1, MTR.5.1).

Common Misconceptions or Errors

- Students may miscount unit squares when they are laid out in a figure. Encourage students to mark unit squares as they are counted.
 - Students can confuse why area is measured in “square units.” Use this exploratory benchmark for students to relate area measurement to the counting of squares. This benchmark provides the opportunity for students to build vocabulary necessary for area measurement.
-

Strategies to Support Tiered Instruction

- Instruction includes modeling how to number the unit square tiles, so students do not miscount when finding area.
 - For example, the teacher provides students with figures created with squares and has them number each square as they count.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36

- Instruction includes creating figures with no gaps or overlaps that have a given area. Students mark each unit square with a number as they count to check that the area of the figure they create has the correct area.
 - For example, the teacher provides students with grid paper and ask them to create a figure with an area of 24 square units. Student count and label 24 connected squares on the grid paper and then shade in the entire figure (see example below).

	1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16	
	17	18	19	20	21	22	23	24	

- Instruction includes measuring the area of given figures by covering them with 1-inch square tiles, leaving no gaps or overlaps. Students count the total number of squares it takes to completely cover the figure and explain how that number represents the area in square units of the figure.
 - For example, the teacher provides a sheet with figures that can be covered perfectly using the square tiles. Students tile the figure and count the square tiles to identify the area.

- Instruction includes students creating their own figures by connecting square tiles with no gaps or overlaps and counting the tiles.
 - For example, the teacher provides a set of 1-inch tiles and asks students to build a figure with an area of 18 square inches. After students have created the figure, they will count and number each tile to ensure they have an area of 18 square inches.

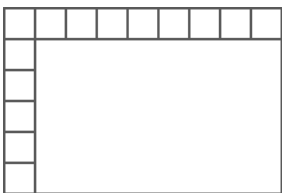
Questions to ask students:

- **Why is area recorded in square units?**
 - Sample answer that indicates understanding: *Area is found by covering a space with unit squares without gaps or overlaps. The area is how many squares it takes to cover the space.*
- **Draw or point to a rectangular shape and ask: How would you find the area of this shape?**
 - Sample answer that indicates understanding: *I can cover the shape with color tiles and count the squares. The total number of squares without having gaps or overlaps would be the area.*
- **Draw a rectangle or rectilinear figure on grid paper; ask: How would you find the area of this shape?**
 - Sample answer that indicates understanding: *I can count the squares on the grid paper. I can tally each square as I count to keep track (OR I can write the number in each square after I count to keep track) and the total number of squares is the area of the shape.*

Instructional Tasks

Instructional Task 1

Kendra used unit squares with 1-centimeter side lengths to find the area of the rectangle below. She started, but then stopped for a lunch break.

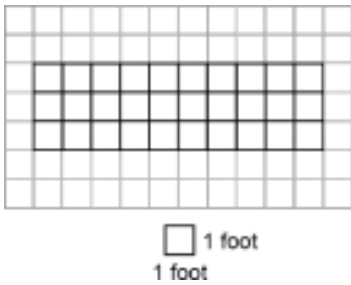


- A. What is the area of Kendra's figure?
 - B. Explain how you counted.
-

Instructional Items

Instructional Item 1

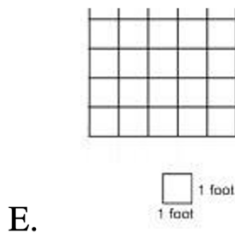
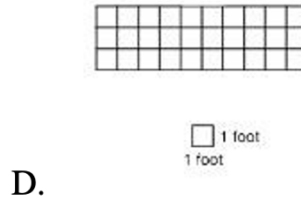
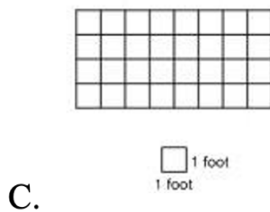
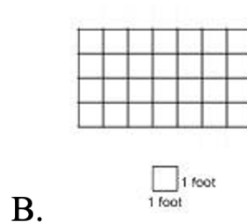
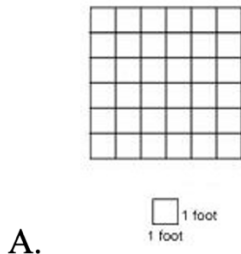
Alex put the tiles shown on his floor.



Part A: What is the area in square feet of the portion that Alex has covered?

Part B: What is the area in square feet of the entire floor?

Part C: The area of Alex's floor is 30 square feet. Select all the floors that could be Alex's.



Achievement Level Descriptors

Benchmark	Context	Assessment Limits
<p>MA.3.GR.2.1 Explore area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps. Find areas of rectangles by counting unit squares.</p> <p>Clarification 1: Instruction emphasizes the conceptual understanding that area is an attribute that can be measured for a two-dimensional figure. The measurement unit for area is the area of a unit square, which is a square with side length of 1 unit.</p>	Both	N/A

Clarification 2: Two-dimensional figures cannot exceed 12 units by 12 units and responses must include the appropriate units in word form (e.g., square centimeter or sq. cm.)			
ALD 2	ALD 3	ALD 4	ALD 5
understands that area is measured in square units.	explores area of a rectangle by counting the given square units.	explores area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps; finds areas of rectangles by counting unit squares.	creates and explains a scenario where area measurement is applicable.

Additional Resources:

[CPALMS Resources](#)

Blog Post: [Teaching Area in 3rd Grade](#)

LearnZillion Videos: [Find the Area of a Square or Rectangle by Counting Unit Squares](#) and [Cover the Area of Shapes Using Square Units](#)

Resources/Tasks to Support Your Child at Home:

Look for real-world examples of rectangular items with a flat surface, for example: a table top, rug, cabinet door or picture. Ask your child to use post-it notes to find the area, making sure they don't have gaps or overlaps. Help them use an efficient method to keep track of the squares counted.

CPALMS Student Tutorial: [Techies Talk Area](#) (open using Chrome; video will not play using Internet Explorer)

Kahn Academy Video: [Intro to Area and Unit Squares](#) – watch this video with your child to review covering shapes with squares to find area.

LearnZillion Video: [Cover the Area of Shapes Using Square Units](#)

Kahn Academy Practice: [Find Area by Counting Unit Squares](#) – have your child practice counting squares to find area of different rectangular figures.