Covering Shapes to Find Area

Teacher		**Class**	Grade 3
Subject	Math	**Topic**	Understanding area
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn that area is the flat space a shape covers. They cover shapes with squares and count to find area.

Curriculum links

- Students recognize area as an attribute of two-dimensional regions [1].
- They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area [1].

Learning objectives

- Students will recognize area as the flat space inside plane figures.
- Students will measure area by counting same-size squares without gaps or overlaps.

Success criteria

- I can show the area inside a shape and say what it means.
- I can cover a shape and count squares to find area.

What students already know

Hold up a sheet of paper. Ask: Point to the flat inside part, then point to the edge. Which part would we paint to show area?

Key words

area	how much flat space inside a shape [6]
plane figure	a flat shape, like a rectangle [1]
square unit	a tiny tile with four equal sides we count with [5]
cover	to put squares across a shape with no gaps or overlaps [1]

Materials

- large paper shapes
- 1-inch paper squares
- trays
- slide deck Slides 1-5 and 7-12
- projector and speakers for Video clip 4
- Worksheet Task B copies
- whiteboards and markers

Before the lesson

- Print Worksheet Task B, one copy per student
- Test Slide 8 and Video clip 4 (0:00-3:19) for sound and picture
- Make trays with 1-inch paper squares and two large paper rectangles per pair
- Clear table space for covering shapes

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Lesson outline

0–5 min **Starter** 5 min · Whole class

Hook students and connect area to flat space they can see.

YOU DO

1. Show Slide 1: How Much Space? Understanding area in Grade 3 math.
2. Hold up a paper and say the hook to focus on covering.
3. Show Slide 2: Area shows how much flat space a shape covers.
4. Show Slide 5 question and have students turn and talk with a partner.

STUDENTS DO

1. Look at the paper and listen to the hook.
2. Think, pair, share the Slide 5 question with a partner.
3. Point to the inside of the desk top and book to show possible area.

Say: How much table space does this paper cover? Let's cover it and find out. Area tells how much flat space is inside. Today we will cover shapes and count squares to find it.

Ask: Which has more area: your desk top or your math book? How can you tell? (The desk top, because it covers more flat space.) · Where is the area, on the edge or in the flat inside? (In the flat inside, not the edge.)

Check understanding: Ask all to point to the inside of their paper for area. If mixed, model tracing the inside with a finger again.

Support: Have students trace the flat front of their book with a finger to feel the inside space. **Stretch:** Ask students to predict if a long thin paper could cover the same space as a short wide book.

Use: Slides 1-2, 5

5–15 min **Teaching** 10 min · Whole class

Explain that area is found by covering with same-size squares.

YOU DO

1. Show Slide 3 cards and point to book cover, rug, and paper as flat shapes.
2. Teach Slide 4 words: area, plane figure, and square unit.
3. Show Slide 7 photo and explain the floor is covered with same-size squares [5].
4. Play Slide 8 video and narrate gaps and overlaps to watch for.

STUDENTS DO

1. Name the flat shapes on Slide 3 and repeat the key words.
2. Watch the floor photo and video and count squares aloud.
3. Show with fingers where there is a gap and where squares overlap.

Say: Area is the amount of space taken up by a 2D shape [6]. We find it by covering the shape with same-size squares with no gaps or overlaps [1]. Then we count the squares to get the area in square units [5].

Worked example: I cover a rectangle with 1-inch squares. I make 3 rows with 4 squares in each row. I count 4, 8, 12. The area is 12 square inches [7].

Ask: What do we count to find area? (Same-size square units with no gaps or overlaps.) · Why must all the squares be the same size? (Different sizes would give a wrong count for how much space is covered [1].) · How many squares cover my 3 by 4 example, and what is the area? (12 squares, so the area is 12 square inches.)

Check understanding: Hold up whiteboards: Write the area for 2 rows of 5 squares. Reteach counting by rows if many write wrong.

Support: Use a small grid where lines match the rectangle edges and count the first row together. **Stretch:** Ask students to predict the total for a larger rectangle before counting all squares.

Use: Slides 3-4, 7-8; Video clip 4 (0:00-3:19)

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15–35 min **Main activity** 20 min · Pairs

Measure area by covering paper rectangles with same-size squares.

YOU DO

1. Show Slide 9 task and give each pair two paper rectangles, 1-inch squares, and a tray.
2. Show Slide 10 fair rules: same size, no gaps, no overlaps.
3. Model lining squares along one edge, then filling the middle with no spaces.
4. Circulate, ask for counts, and have pairs compare which rectangle has greater area.

STUDENTS DO

1. Cover two paper rectangles with same-size squares using fair rules [1].
2. Count squares to find each area and say, The area is __ square inches.
3. Compare rectangles and explain which takes more flat space and why.

Say: In pairs, cover each rectangle with squares, no gaps or overlaps. Push squares together with no spaces and do not stack them. Count squares to find the area and tell which shape covers more space.

Worked example: I cover Rectangle A with 1-inch squares. First row has 6, second row has 6. I count 12 total, so the area is 12 square inches. Rectangle B holds 10 squares, so A has greater area.

Ask: What is the area of your rectangle? (The area is __ square inches, equal to the count of squares.) · How do you know you measured fairly? (We used same-size squares every time with no gaps and no overlaps [1].)

Check understanding: Pairs hold up rectangles and call out areas. If counts differ, recount together row by row.

Support: Give a small rectangle that fits squares exactly and let students line the edge first, then fill the middle. **Stretch:** Give an L-shape made of squares and ask students to count and compare its area to the rectangle.

Use: Slides 9-10

35–50 min **Practice** 15 min · On their own

Practice counting squares correctly to find exact area.

YOU DO

1. Give out Worksheet Task B: Count square units to find area. No gaps, no overlaps.
2. Read the directions together and do the first shape by pointing and counting.
3. Have students work alone to count and write each area in square units.
4. Collect quick scan of answers and address gaps or double counts.

STUDENTS DO

1. Complete Worksheet Task B alone, counting squares row by row.
2. Write each area in square units and check for gaps.
3. Compare one answer with a partner and recount if different.

Say: Now you try alone. Look at each shape and count the square units. Remember no gaps, no overlaps. Write the area as a number of square units.

Worked example: This shape has 2 rows of 3 squares. I count 3, 6. I write 6 square units. I check there are no spaces and no stacked squares.

Ask: How did counting by rows help you? (Rows keep equal groups so I do not miss or double count squares [1].) · What makes a count unfair? (Leaving gaps or stacking squares on each other.)

Check understanding: Check Task B answers with thumbs up for each shape. Pull small group to recount with tiles if many errors.

Support: Let students cover with real tiles first and push them together to see gaps disappear before counting.
Stretch: Add a point bonus if the estimate is within two squares of the exact count on an extra shape.

Use: Worksheet Task B

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50–60 min **Plenary** 10 min · Whole class

Review what area means and check who can measure it.

YOU DO

1. Show Slide 11 and vote on which square to use for the classroom rug.
2. Ask why same-size squares matter for fair measurement [1].
3. Show Slide 12 quiz and cold-call answers for what area tells and what we count.
4. Restate success criteria and preview next work on rows and multiplication.

STUDENTS DO

1. Vote: Tiny postage-stamp squares, Sticky-note squares, or Big floor-tile squares for the rug.
2. Answer the quiz: What does area tell us and what do we count?
3. Self-assess with I can statements on fingers.

Say: Tell me what area tells us and what we count. We pick one same-size square for a job. Then we cover, count, and give the area in square units.

Ask: What does area tell us? (How much flat space a shape covers.) · Which square would you use to measure our classroom rug? (Big floor-tile squares, because tiny squares would take too long but must still be same-size [5].) · What do we count to find area? (Same-size square units with no gaps or overlaps.)

Check understanding: Use Slide 12 quiz as hinge: all write answers on whiteboards. Reteach covering idea if many confuse edge with inside.

Support: Let students trace the edge with one color and stamp one tile-print inside to feel going around versus covering [1]. **Stretch:** Show two rectangles with the same going-around length but different covering counts and ask what students notice.

Use: Slides 11-12

Common mistakes

Mistake	How to spot it	How to fix it
Leaving gaps or stacking squares when covering	Counts differ from partner or squares show spaces or overlaps	Push squares together with no spaces and recount row by row, since area needs total same-size units without gaps or overlaps [1].
Confusing area with the edge around the shape	Student traces the border when asked to show area	Point to the flat inside for area and lay yarn on edge versus tiles inside to show linear versus area measures [1][3].
Using mixed-size squares in one measurement	Area count mixes large and small tiles	Replace with one same-size square unit and recount, because the square with sides of unit length is the standard unit [1].

Support

- Give a small rectangle that fits squares exactly and let students line the edge first, then fill the middle.

Stretch

- Give an L-shape made of squares and ask students to count and compare its area to the rectangle.

For the LSE or teaching assistant

Stay with target pairs in main activity to model lining squares and counting by rows; help recount Task B shapes.

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Check for understanding

Question	Answer
What does area tell us?	How much flat space a shape covers.
A paper is covered by 10 same-size squares with no gaps. What is its area?	10 square units.
Why do we use same-size squares with no gaps or overlaps?	To measure fairly and get the true count of covering units.

Sources

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