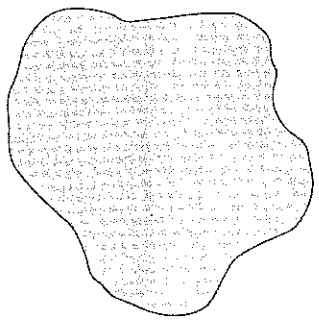
Area: Using Strategies

You will need

- paper and scissors
- a variety of flat, identical objects (e.g., pattern blocks, square tiles, pennies or round counters, sticky notes)
- Pizza Shapes (BLM 22, optional)
- transparent square grids (from BLM 6)
- Student Resource pages 180–181



Open-Ended Intervention

Before Using the Open-Ended Intervention

Provide an irregular paper shape and some flat objects to measure with, such as pattern blocks, square tiles, and pennies or round counters. Ask:

- How might you figure out the area of this shape? (e.g., *Cover the shape with something like pattern blocks or square tiles.*)
- Which of these units might be good to use? Why? (e.g., *Pennies fit close together, but there are gaps between them. Square tiles or triangles fit together better.*)

Show how to put parts of the uncovered shape together to make a whole unit. Next, show students a transparent square grid (larger than 1 cm is good but not necessary; could be made from 1 cm Square Grid Paper (BLM 6)). Ask:

- How can you use this square grid to measure the area of the shape? (e.g., *Put the grid on top of the shape, and count the whole squares and the part squares.*)

Using the Open-Ended Intervention (Student Resource page 180–181)

Provide a variety of identical flat objects (e.g., pattern blocks, square tiles, pennies) and transparent square grids. Together, read the task on the student pages. If students prefer to use 2 given shapes, give them copies of Pizza Shapes (BLM 22). Give students time to work, ideally in pairs.

Encourage students to use the results they get with the first unit to predict whether there will be more or fewer with the second unit.

Observe whether students are able to

- reasonably predict which shape has the greater area
- measure or estimate areas using non-standard units, with as few gaps as possible
- measure or estimate areas in square units, using a square grid
- recognize parts of shapes and, if possible, combine them to make a whole shape
- compare areas by counting the number of same-sized units used and comparing

Consolidating and Reflecting

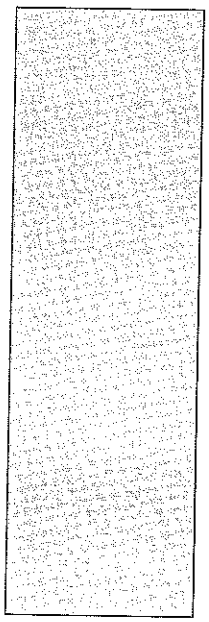
Ensure understanding by asking questions about students' work:

- Were the pizzas the same size or different? How do you know? (e.g., *The area of the rectangular pizza was greater because I used more triangle blocks to cover it.*)
- When you used the square grid did you find the same results? (e.g., *The rectangular pizza was still larger than the round one.*)
- What would you notice if you used pennies to compare the 2 areas? (e.g., *Both pizzas will have small gaps between the pennies, but you can still estimate the area if they are placed as close together as possible.*)
- Suppose 2 shapes are each 5 square units. Would they have to look exactly the same? (*No.* e.g., *You don't know what shapes they are; you just know the area.*)

Area: Using Whole Units

You will need

- a cutout shape
- a variety of flat, identical objects (e.g., pattern blocks, square tiles, a cardboard cutout or sticky notes of any shape, loonies, or large round counters)
- chart paper, coloured pencils, and straightedges
- Student Resource page 186



Open-Ended Intervention

Before Using the Open-Ended Intervention

Provide a cutout rectangle, 2.5 cm by 8 cm. Put 2 square tiles on top of the cutout. Ask:

- Why might I say that the rectangle is bigger than 2 tiles? (e.g., *There is still some space left over.*)

Explain that *area* describes how much surface the rectangle covers. Ask:

- How many squares would it take to cover the rectangle? (*3*)
- Is the answer exact? (e.g., *No, but there isn't much left over.*)
- What if you covered the rectangle with loonies? How would you describe the area? (e.g., *I can use 3 loonies, but they don't cover all of the rectangle. There's a little bit not covered, so I'd say the area is a bit more than 3 loonies.*)

Using the Open-Ended Intervention (Student Resource page 186)

Provide a variety of objects for measuring area, including cardboard cutouts that you might make ahead of time (or identical sticky notes). Also provide chart paper, coloured pencils, and straightedges that students can use for drawing.

Read through the task with students. Give students time to work, ideally in pairs.

Observe whether students can

- measure areas using non-standard units with as few gaps as possible
- use many identical units or the same unit repeatedly (iteration)
- recognize that parts of units can be combined to make a whole unit

Consolidating and Reflecting

Ensure understanding by asking questions about students' work:

- Why were the game boards different sizes even though they all had 10 sections? (e.g., *The unit used to create each of the equal sections can be anything. It can big like a card or smaller like a square tile.*)
- Which shapes were exactly 10 units in area? Which were not? (e.g., *When I used trapezoid blocks or triangle blocks or rhombus blocks, these gave areas that were exact. When I used my sticky-note flower shapes, the area was a bit more than 10 flower units.*)
- Which shapes were easiest to use to make your game board? Why? (e.g., *shapes like pattern blocks, because they fit together without any gaps*)
- If you made 10 sections by using loonies, would the area be exactly 10 units? (e.g., *No, loonies are round, so they don't fit together exactly. The area would be more than 10 loonie units.*)