Area 5.2 lesson plan

Relationships between formal measurement units: measure and calculate area in square metres or square centimetres

Cut and compare

Pairs or individual students commence by taking a rectangle such as an A4 sheet of paper or smaller. Students draw and cut along one diagonal and investigate whether the two triangles which have been made are the same size. Students continue with different-sized rectangles to see if they can find a rectangle where the two triangles are not the same.

Students select one of their rectangles and use the area of the rectangle to calculate the area of each triangle.

Whole class discusses how to find the area of a right-angled triangle.

Students should

1. select and use the appropriate unit to measure area
3. investigate the area of triangles

Grouping

Step 1: whole-class introduction
Step 2: individual or paired working
Step 3: whole-class discussion

Outcomes

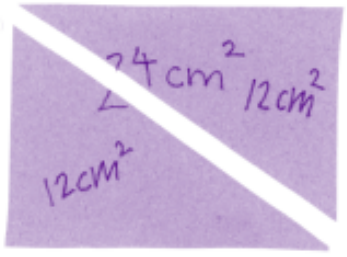
MS3.2 Selects and uses the appropriate unit to calculate area, including the area of squares, rectangles and triangles.

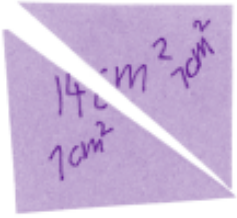
SGS3.2a Manipulates, classifies and draws two-dimensional shapes and describes side and angle properties.

WMS3.4 Gives a valid reason for supporting one possible solution over another.

Materials

rulers, pencils, paper, scissors, paste





you can work out the area of the triangles by ..... halving the area of the rectangles.

AREA

Step 1

Discuss how to calculate the area of a rectangle.

Ask the students to predict the shape and size of the pieces when a rectangle is cut diagonally. Ask the students if the result could ever be different.

Discuss how students could prove that two triangles cut diagonally from a rectangle or square will always have the same area, or will never have the same area. Introduce the task and suggest that students may also be able to may a statement about how to find the area of a triangle.

Step 2

Have your students work individually or in pairs to:

- draw, measure and cut rectangles of different sizes
- compare the triangles formed by cutting the rectangles diagonally
- record their findings
- choose one rectangle, find the area and calculate the area of each triangle
- make a statement about the areas of the triangles and rectangles that were investigated.

Step 3

Discuss the results of the investigations, and how the area of a right-angled triangle may be calculated.

First I calculated on a sheet the area of a variety of rectangles using the formula length × breadth. Next I ruled diagonal lines and divided the rectangle into 2 identical triangles. Then I determined their area by halving the area of the original rectangle. I tried to draw a rectangle that couldn't divide into 2 equal triangles but I could not. Therefore I learnt formula of a triangle is half of a rectangle.

Questioning

What does area of this rectangle mean?

What happens when you cut a rectangle in half, diagonally?

What will you make?

Will this always happen?

Are the triangles always the same size if I use different-sized rectangles?

How could you work out the area of one of these two triangles?

Check that students:

- draw, measure and cut accurately
- experiment with a range of rectangles
- calculate the area of one triangle.

Discussion

What happened when you changed the size and shape of the rectangles?

What would happen with a square?

Would this work with any other shapes?

Can you explain how to find the area of a triangle?

Will this work for all triangles?