

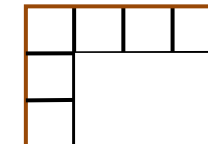
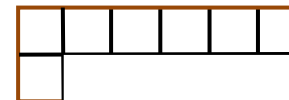
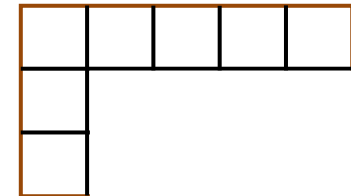
METRIC AREA, RELATED TO METRIC LENGTH.

INVESTIGATIONS OVERVIEW PAGE

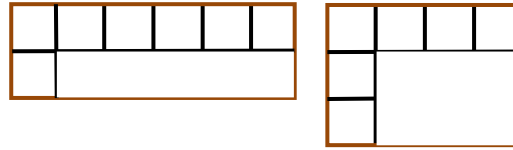
THIS PAGE IS A SUMMARY OF THE INVESTIGATIONS THAT STUDENTS MAY ENGAGE IN TO DEEPEN THEIR RELATIONAL UNDERSTANDING. INVESTIGATIONS WITH INSTRUCTIONS TO STUDENTS FOLLOW ON SUBSEQUENT PAGES.

- Children draw and explain a metric measurement chart. They draw a line that is 1 centimetre long. They add a dimension to make the 1 centimetre line, a square. They measure the length of each dimension, finding each is 1 centimetre long. They describe their square as 1 square centimetre. Children construct a square metre using a metre ruler/tape, newspaper and masking tape. They measure the length of each dimension, finding each is 1 metre long. They describe their square as 1 square metre. *Reflection: What is a square centimetre? what is a square metre?*
- Children have a rectangular shape with a length that is a whole number of square metres or square centimetres, or a rectangular shape with a length that is not a whole number of square metres or square centimetres, and a square metre or square centimetre. Children measure the area of the shape using one square metre or square centimetre, by marking and moving in rows. Children count the squares by ones OR rhythmic count OR skip count OR multiply the number of rows by the number of square metres or square centimetres in each row. Children then add any fractions of square metres or square centimetres. Children record the area and the square metre or square centimetre as their unit of measurement. *Reflection: How can we use 1 square metre or square centimetre to measure area?*
- In pairs or small groups, children are given / construct a square metre to measure a rectangular area of the room, or a rectangular area of an outdoor surface. *Reflection: How can we use 1 square metre to measure the area of shapes?*
- Children partially measure the area of the rectangle by marking and moving a square centimetre along the top row and down the left side. They work out the area. *Reflection: How can we use 1 square centimetre to measure the area of shapes?*
- In pairs or small groups, children use / construct a square metre to compare the areas of two same-sized rectangles with different dimensions taped or drawn on the floor/ground (for example, 4m by 3m and 2m by 6m). *Reflection: How can we use 1 square metre to measure the area of shapes with the same area?*

Square centimetres are available for purchase from www.cleverpatch.com.au or cubic centimetres may be used by drawing attention to the area of one surface – 1 square centimetre. Children may use the square metre that they constructed from newspaper.



- Children partially measure the areas of two rectangles of the same size by marking and moving a square centimetre along the top row and down the left side. They work out the area of each rectangle. They explain that different rectangles may have the same area.

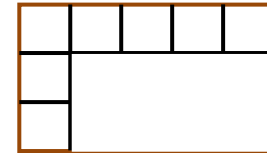


Reflection: How can we use 1 square centimetre to measure the area of shapes with the same area?

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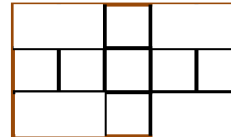
- In pairs, each child partially measures the area of a rectangle by marking and moving a square centimetre along the top row and down the left side. They give their rectangle to a friend who works out the area.

Reflection: How can we use 1 square centimetre to measure the area of shapes?



- In pairs, children are shown a rectangle partially covered in square centimetres. Children work out the area of the rectangle.

Reflection: How can we use 1 square centimetre to measure the area of shapes?



- In pairs, children make areas of a specific size, for example, a rectangle or non-rectangle that has an area of 12 square centimetres. Children draw the rectangle and the array of squares. Reflection: How can different shapes have the same area?
- In pairs, children roll a die twice to determine how many square centimetres to put along the top row and how many rows to make. They predict how many square centimetres they will need to make the rectangle. Children make the rectangle by marking and moving the square centimetre. They work out the area by counting the squares or by multiplying the number of rows by the number of squares in each row. They record the area. Reflection: How can we measure the area of shapes?
- In pairs, children construct a square centimetre from paper or card. They cut the square centimetre in half along one dimension and join the halves together end to end, for example,



They identify that the area is still 1 square centimetre.

They cut a square centimetre in half along the diagonal, and join the triangles back to back, for example,



They identify that the area is still a square centimetre. They cut a square centimetre into different parts, joining them together to make a different shape, identifying that the area is still a square centimetre. Children explain that a square centimetre needs not be square. Reflection: What is the area of a square centimetre?

- In pairs, children construct a square metre from paper or card. They cut the square metre in half along one dimension and join the halves together end to end, for example,



They identify that the area is still 1 square metre.

They cut a square metre in half along the diagonal, and join the triangles back to back, for example,



They identify that the area is still a square metre. They cut a square metre into different parts, joining them together to make a different shape, identifying that the area is still a square metre. Children explain that a square metre needs not be square. [Reflection: What is the area of a square metre?](#)

Metric Area, Related to Metric Length

Draw and explain a metric measurement chart.

Draw a line that is 1 centimetre long.

Add a dimension to make the 1 centimetre line, a square.

Measure the length of each dimension.

Is the length of each dimension, 1 centimetre?

Is your square, 1 square centimetre?

Reflection: What is a square centimetre?

Construct a square metre using a metre ruler/tape, newspaper and masking tape.

Measure the length of each dimension.

Is the length of each dimension, 1 metre?

Is your square, 1 square metre?

Reflection: What is a square metre?

Metric Area, Related to Metric Length

Make a square metre, for example, out of newspaper.

Go outside to an area with concrete ground.

Select or draw in chalk a rectangular area.

Use your square metre as your unit of measurement.

Measure the area of the shape by marking in chalk and moving the square metre in rows.

Count the square metres by ones OR rhythmic count OR skip count OR multiplying the number of rows by the number of whole square metres in each row.

Imagine joining together any parts of square metres to make more whole square metres.

Record the area of the shape, naming the square metre as your unit of measurement.

Reflection: How can we use 1 square metre to measure area?

Metric Area, Related to Metric Length

Select a rectangular shape.

Use a square centimetre as your unit of measurement.

Measure the area of the shape by marking and moving the square centimetre in rows.

Count the square centimetres by ones OR rhythmic count OR skip count OR multiplying the number of rows by the number of whole square centimetres in each row.

Imagine joining together any parts of square centimetres to make more whole square centimetres.

Record the area of the shape, naming the square centimetre as your unit of measurement.

Reflection: How can we use 1 square centimetre to measure area?

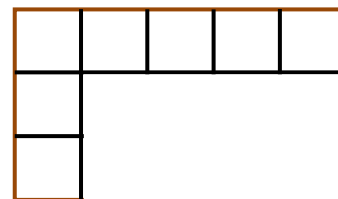
Metric Area, Related to Metric Length

Sit in pairs or small groups.

Have a square metre to measure a rectangular area of the room, or a rectangular area of an outdoor surface.

Measure the area of the rectangle by marking and moving a square metre along the top row and down the left side, for example,

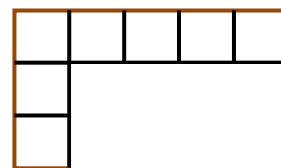
Record the area.



Reflection: How can we use 1 square metre to measure the area of shapes?

Metric Area, Related to Metric Length

Partially measure the area of the rectangle by marking and moving a square centimetre along the top row and down the left side, for example,
Work out the area.



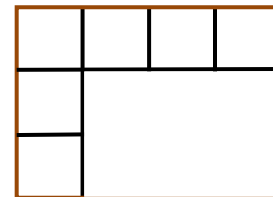
Reflection: How can we use 1 square centimetre to measure the area of shapes?

Metric Area, Related to Metric Length

Sit pairs or small groups.

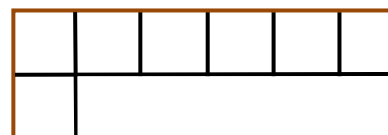
Have 2 rectangles taped or drawn on the floor or ground.

Partially measure the area of each rectangle by marking and moving a square metre along the top row and down the left side, for example,



Work out the area of each rectangle.

Can different rectangles have the same area?

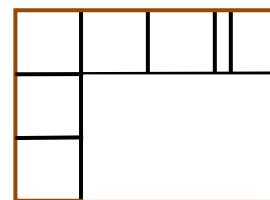


Reflection: How can we use 1 square metre to measure the area of shapes with the same area?

Metric Area, Related to Metric Length

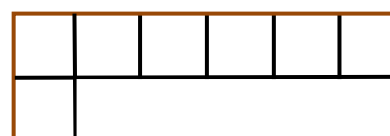
Have 2 rectangles.

Partially measure the area of each rectangle by marking and moving a square centimetre along the top row and down the left side, for example,



Work out the area of each rectangle.

Can different rectangles have the same area?



Reflection: How can we use 1 square centimetre to measure the area of shapes with the same area?

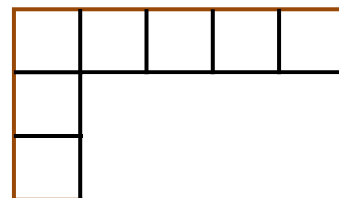
Metric Area, Related to Metric Length

Sit with a friend.

Each of you have a different rectangle.

Each of you partially measures the area of a rectangle by marking and moving a square centimetre along the top row and down the left side, for example,

Swap rectangles and work out the area of one another's rectangle.



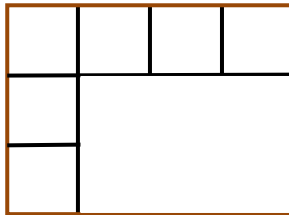
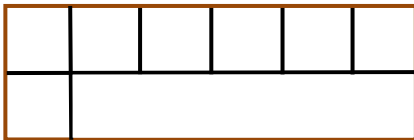
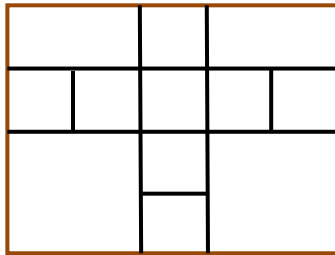
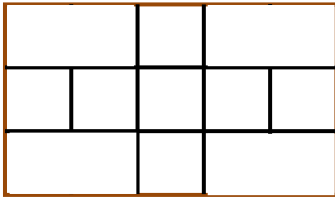
Reflection: How can we measure the area of shapes in square centimetres?

Metric Area, Related to Metric Length

Work out the areas of these rectangles in square centimetres.



= 1 square centimetre (not to scale)



Reflection: How can we measure the area of shapes?

Metric Area, Related to Metric Length

Sit with a friend.

Each of you construct a different shape with an area of 12 square centimetres.

Compare your shapes.

Are the shapes the same or different?

Do the shapes have the same area?

Reflection: How can different shapes have the same area?

Metric Area, Related to Metric Length

Select a die.

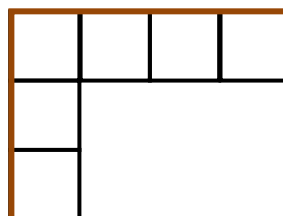
Roll the die to determine how many square centimetres to mark and move along the top row of a rectangle, for example, 4



Roll the die again to determine how many rows to make, for example, 3

Predict how many square centimetres you will need to make the rectangle.

Make the rectangle by marking and moving the square centimetre, for example,



Work out the area by counting the square centimetres or by multiplying the number of rows by the number of squares in each row.

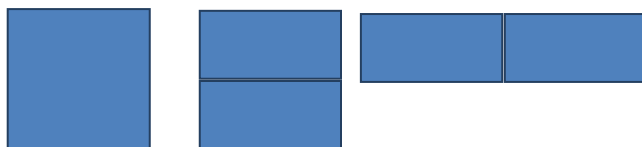
Record the area.

Reflection: How can we measure the area of shapes in square centimetres?

Metric Area, Related to Metric Length

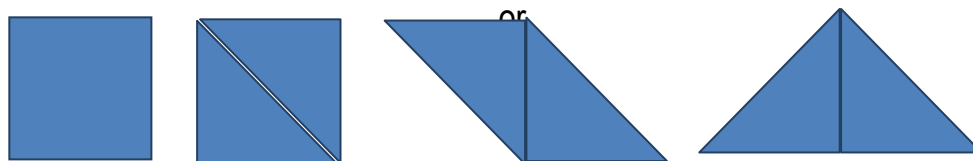
Have square centimetres made from card.

Cut the square centimetre in half along one dimension and join the halves together end to end, for example,



Is the area still 1 square centimetre?

Cut a square centimetre in half along the diagonal, and join the triangles back to back, for example,



Is the area still a square centimetre?

Cut a square centimetre into different parts, joining them together to make a different shape.

Is each area still a square centimetre?

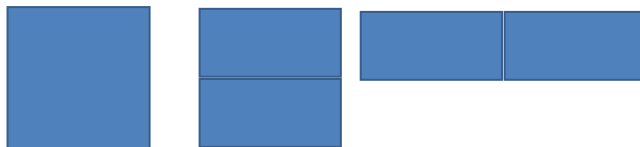
Does a square centimetre need to be square?

Reflection: What is the area of a square centimetre?

Metric Area, Related to Metric Length

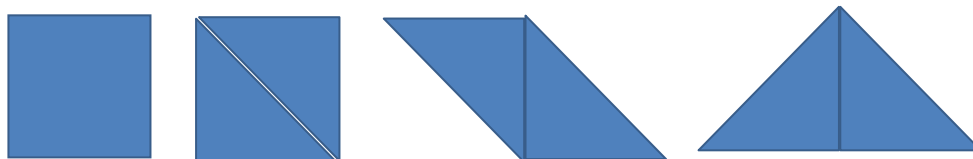
Have or construct square metres made from newspaper.

Cut the square metre in half along one dimension and join the halves together end to end, for example,



Is the area is still 1 square metre?

Cut a square metre in half along the diagonal, and join the triangles back to back, for example, or



Is the area is still a square metre?

Cut a square metre into different parts, joining them together to make a different shape.

Is each area still a square metre?

Does a square metre need to be square?

Reflection: What is the area of a square metre?