

AREA – SINGLE SQUARE UNIT, ARRAY.

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.

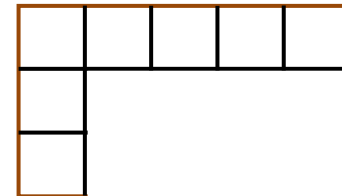
- Children have a rectangular shape with a length that is / is not a whole number of the square the children will be using as their unit of measurement OR a non-rectangular shape the children will be using as their unit of measurement and a square to be used as a unit of measurement. Children measure the area of their selected shape using one square shape, 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 squares in each row. Children then add any fractions of squares. Children record the area and their unit of measurement.

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

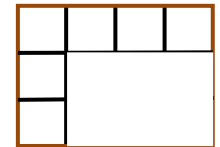
- Children compare the areas of 2 or more shapes using a single square unit, describing, 'The first shape's area is larger than the second shape's area' and 'The second shape's area is smaller than the first shape's area', and 'The first rectangle has the largest area. The second rectangle has the second largest area. The third rectangle has the third largest area. The first rectangle's area is larger than the second rectangle's area. The second rectangle's area is larger than the third rectangle's area. So the first rectangle's area is also larger than the third rectangle's area'. Reflection: How can we use 1 square to measure and order the areas of 2 or more shapes?

- In pairs or small groups, children are given a large square to measure a rectangular area of the room, or a rectangular area of an outdoor surface. Reflection: How can we use 1 square to measure the area of shapes?

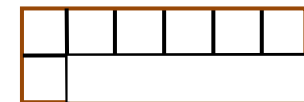
- Children partially measure the area of the rectangle by marking and moving a square along the top row and down the left side, for example, They work out the area. Reflection: How can we use 1 square to measure the area of shapes?



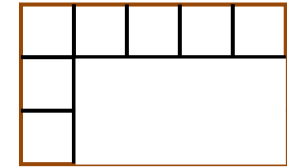
- In pairs or small groups, children use a large square (for example, 10 cm x 10 cm) to compare the areas of two same-sized rectangles with different dimensions taped or drawn on the floor (for example, 30 cm by 40cm and 20cm by 60cm). Reflection: How can we use 1 square to measure the area of shapes with the same area?



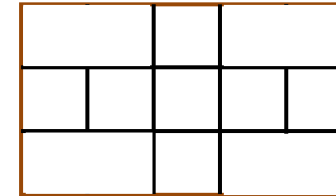
- Children partially measure the areas of two rectangles of the same size by marking and moving a square along the top row and down the left side, for example, They work out the area of each rectangle. They explain that different rectangles may have the same area. Reflection: How can we use 1 square to measure the area of shapes with the same area?



- In pairs, each child partially measures the area of a rectangle by marking and moving a square along the top row and down the left side, for example, They give their rectangle to a friend who works out the area. **Reflection: How can we use 1 square to measure the area of shapes?**



- In pairs, children are shown a rectangle partially covered in squares, for example, Children work out the area of the rectangle. **Reflection: How can we use 1 square to measure the area of shapes?**



- Children are shown a chess board and are asked to work out the area. (Also a hundred chart, half a chess board, quarter of a hundred chart, quarter of a chess board) **Reflection: How can we use 1 square 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 squares. 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 squares to put along the top row and how many rows to make. They predict how many squares they will need to make the rectangle. Children make the rectangle by marking and moving the square. 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?**
- Children measure the area of a shape using different-sized squares, identifying that they need more small squares than large squares to measure the same area, and they need less (fewer) large squares than small squares to measure the same area. **Reflection: Why do we need fewer large squares, and more small squares, to measure the same area?**
- Extension: Children are given a square and a square that is the size of 4 squares, for example, a 5 cm square and a 10 cm square. They make 2 identical rectangles, one using the 5cm squares and one using the 10cm squares. They record the area small and large squares. They check how many small squares they need to make the large square (4). They identify that they needed 4 times more small squares as large squares because they need 4 small squares for each large square. They identify that they needed 4 times fewer large squares as small squares because for 4 small squares, they only need 1 large square. **Reflection: Why do we need 4 times fewer large squares, and 4 times more small squares, to measure the same area?**

Area – Single Square Unit, Array.

Select a rectangle or rectangular surface of an object OR

Select a shape or flat surface of an object that is not a rectangle.

Select a square to use as your unit of measurement.

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

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

Imagine joining together any parts of squares to make more whole squares.

Record the area of the shape, naming your unit of measurement.

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

Area – Single Square Unit, Array.

Select 2 or more shapes, for example,



Select a square to use as your unit of measurement.

Measure the areas of the shapes by marking and moving the square in rows.

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

Imagine joining together any parts of squares to make more whole squares.

Record the areas of the shapes, naming your unit of measurement.

Place the shapes in order of area, for example,



Describe the areas of the shapes in relation to one another, for example,

The orange shape has a smaller area than the blue shape.

The blue shape has a smaller area than the green shape.

So the orange shape also has a smaller area than the green shape.

The green shape has a larger area than the blue shape.

The blue shape has a larger area than the orange shape.

So the green shape also has a larger area than the orange shape.

Reflection: How can we use 1 square to measure and order the areas of 2 or more shapes?

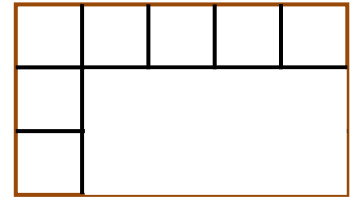
Area – Single Square Unit, Array.

Sit in pairs or small groups.

Have a large square 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 along the top row and down the left side, for example,

Record the area.



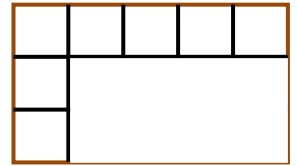
Reflection: How can we use 1 square to measure the area of shapes?

Area – Single Square Unit, Array.

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

Work out the area.

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

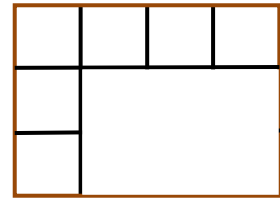


Area – Single Square Unit, Array.

Sit pairs or small groups.

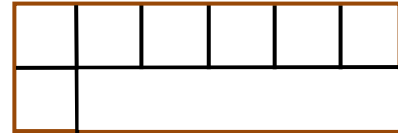
Have 2 rectangles taped or drawn on the floor.

Partially measure the area of each rectangle by marking and moving a square 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 to measure the area of shapes with the same area?

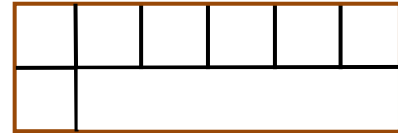
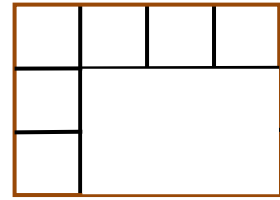
Area – Single Square Unit, Array.

Have 2 rectangles.

Partially measure the area of each rectangle by marking and moving a square 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 to measure the area of shapes with the same area?

Area – Single Square Unit, Array.

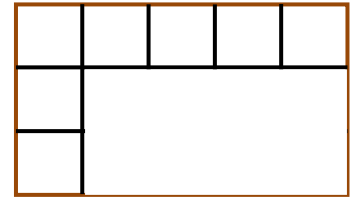
Sit with a friend.

Each of you have a different rectangle.

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

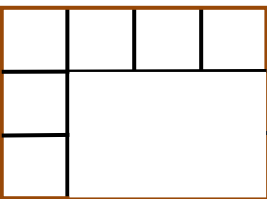
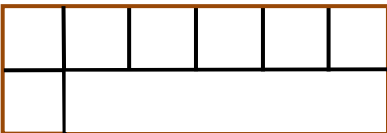
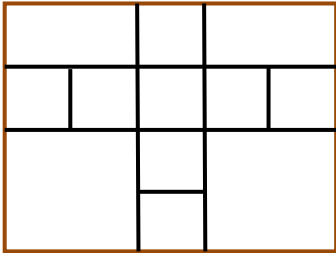
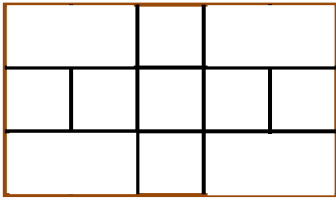
Swap rectangles and work out the area of one another's rectangle.

Reflection: How can we measure the area of shapes?



Area – Single Square Unit, Array.

Work out the areas of these rectangles.



Reflection: How can we measure the area of shapes?

Area – Single Square Unit, Array.

Have a chess board.

Work out the area.

Have a hundred chart.

Work out the area.

Have half a chess board.

Work out the area.

Have half a hundred chart.

Work out the area.

Have quarter of a chess board.

Work out the area.

Have quarter of a hundred chart.

Work out the area.

Reflection: How can we measure the area of shapes?

Area – Single Square Unit, Array.

Sit with a friend.

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

Compare your shapes.

Are the shapes the same or different?

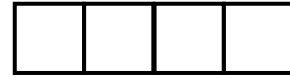
Do the shapes have the same area?

Reflection: How can different shapes have the same area?

Area – Single Square Unit, Array.

Select a die.

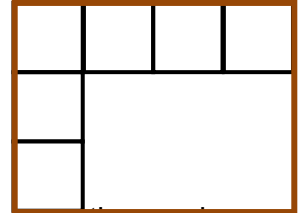
Roll the die to determine how many squares to mark and move along the top row of a rectangle, for example, 4



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

Predict how many squares you will need to make the rectangle.

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



Work out the area by counting the squares 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?

Area – Single Square Unit, Array.

Measure the area of a shape using different-sized squares

Do you need more small squares than large squares to measure the same area?

Why?

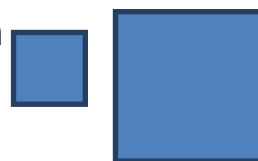
Do you need fewer (less) large squares than small squares to measure the same area?

Why?

Reflection: Why do we need fewer large squares, and more small squares, to measure the same area?

Area – Single Square Unit, Array.

Have a small square and a large square that is 4 times larger than the small square, for example,



How many small squares do you need to make the large square?

Measure the area of a shape using the small squares.

Measure the area of the same shape using the large squares.

Do you need 4 times more small squares than large squares to measure the same area?

Why?

Do you need 4 times fewer (less) large squares than small squares to measure the same area?

Why?

Reflection: Why do we need 4 times fewer large squares, and 4 times more small squares, to measure the same area?