

At-Home Investigation

Area is a measure of flat space. Today you will compare the area of the top of your dining table or desk with the area of the mattress on your bed.

Does your mattress or your table have more area?

How many pieces of paper would it take to cover the top of your dining table?

How many pieces of paper would it take to cover the mattress on your bed?

Explain your plan for working it out.

Carry out your plan and explain your findings:

Draw what you found out on the next page. The boxes are scaled to represent A4 pieces of paper. Calculate the area of each piece of paper (30x21cm) and use this to work out how many pieces of A4 paper is the same as 1m². Now that you have this measurement, convert the areas you measured into m² for comparison.

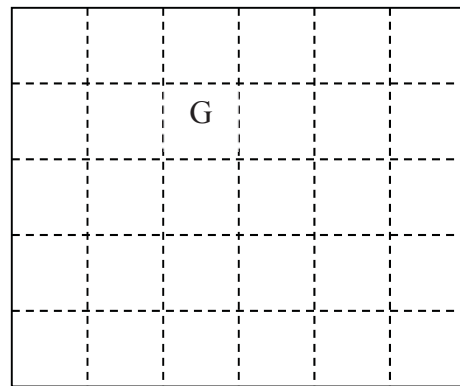
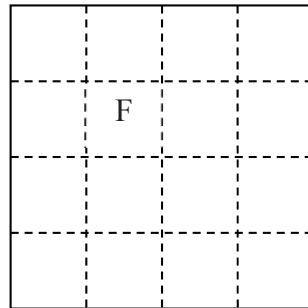
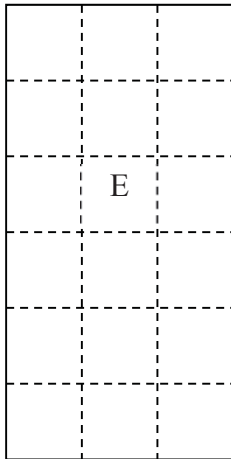
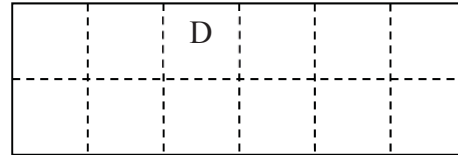
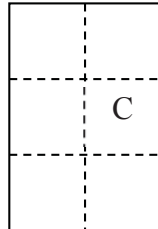
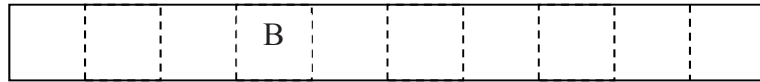
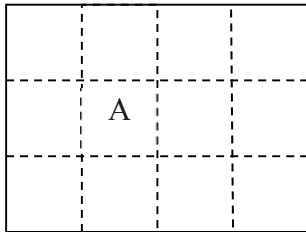
Account for difficulties:

How did you account for partial pieces of paper? How did you make sure that your measurements were accurate?

Each box below is scaled to be similar to A4.

E5. Area of a rectangle

Use the following examples to help you to work out a rule for finding the area of a rectangle.



Rectangle	Base measurement	Height	Area	What is the rule?
A				
B				
C				
D				
E				
F				
G				

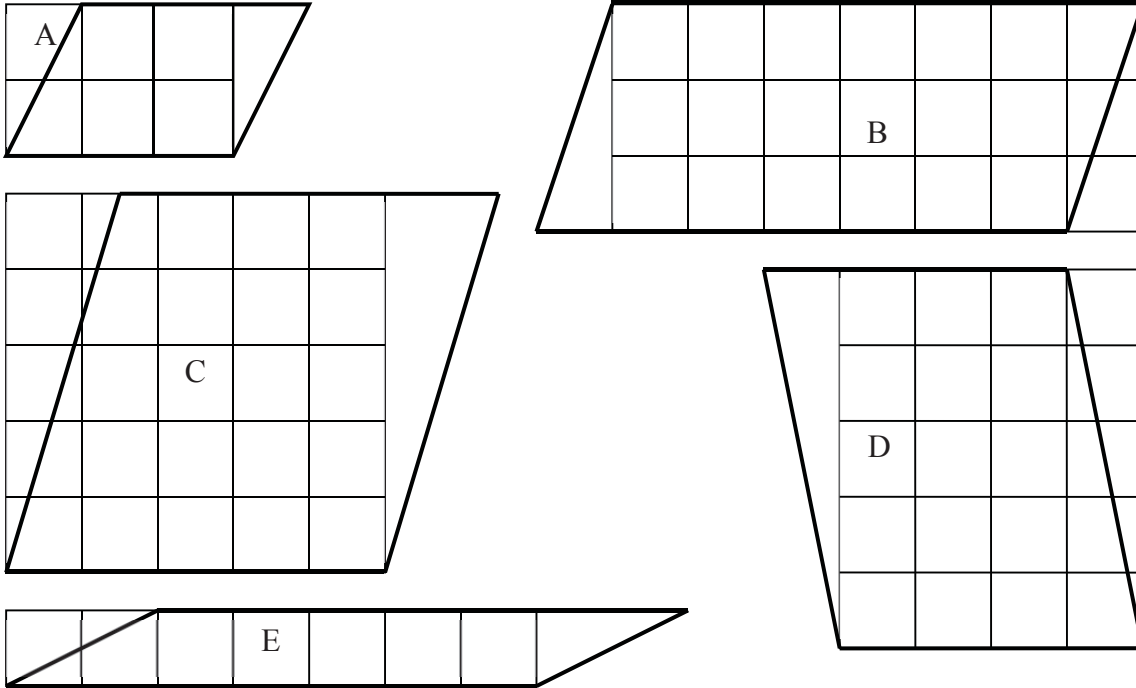
What is the rule for finding the area of a rectangle?

BACKWARDS QUESTION:

If the area of a rectangle was 25cm^2 , what could its sides be? How long would the sides be if it was a square?

E7. Finding the area of parallelograms

The area of a parallelogram is related to the area of a rectangle. Use the shapes below to help you formulate a rule for finding the area of a parallelogram based on the area of a rectangle.



Shape	Base of rectangle and parallelogram	Height of rectangle and parallelogram	Area of rectangle	Rule for area of rectangle	Area of parallelogram (counted)	Pattern between rectangle and parallelogram
A						
B						
C						
D						
E						

What is the rule for finding the area of a parallelogram?

BACKWARDS QUESTION:

If the parallelogram and a rectangle had the same area, would they have the same length sides?

Multiplication and division practice grids:

x	2	3	4	5	6	7	8	9	10
2									
3									
4									
5									
6									
7									
8									
9									
10									

x	4	8	7	2	3	9	10	6	5
2									
3									
4									
5									
6									
7									
8									
9									
10									

÷									
		16				6			
			21	15					
					8	40			
	20		30						
		42						54	
				35	21				
		64	48						
	36								81
					20	100			

÷									
		27							30
			6			4			
	40							25	
			24	36					
	56		28						
				63			45		
					60			100	
		36				8			
			48	56					

PROBLEM 19: CALCULATING AREA

Your teacher says that the area of any triangle is just half that of the rectangle with the same base and height. Prove or disprove this statement by creating rectangles and triangles and using a spreadsheet to show the relationship between their areas.

Choose a height and a base for your triangle. Draw five different triangles as you can that have this base and height. Work out the area of each, then put your results into the table below. You will need your own paper.



Triangle	Base	Height	Area	Is there a pattern?
A				
B				
C				
D				
E				

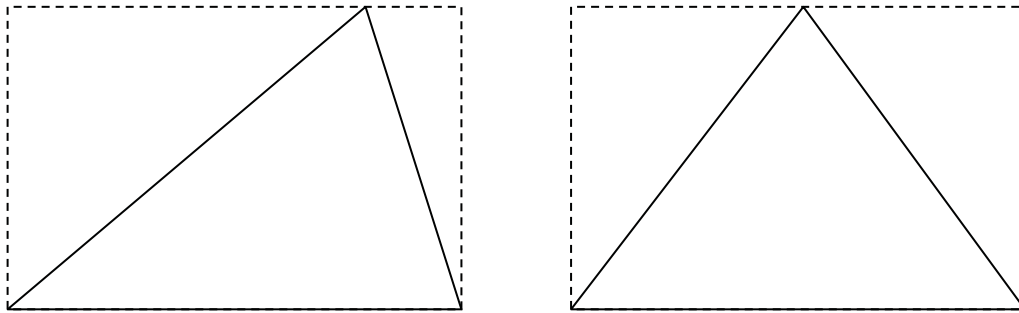
What patterns did you find for your triangles?

What would the area of a rectangle with the same base and height be?

Does this fit with the statement above?

Compare your data with the rest of your class. What do you find? How can you use this information?

Consider the following triangles and work out their area just by using the pattern that you have found:

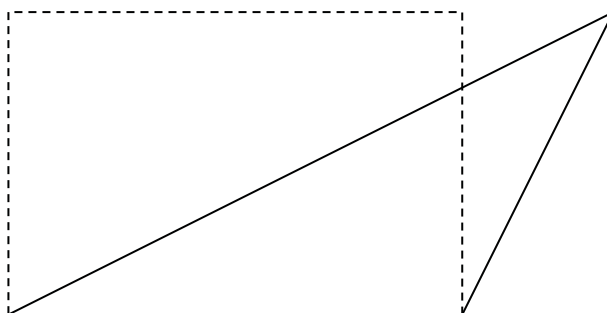


Communicating and Reflecting:

How did you work out your answer? How do you know that this is the right way to work out the solution? What pattern, strategy or formula did you find?

Manipulation problem:

See if you can work out the area of this triangle.
Explain how you did it and any patterns that you found.



<p><u>Teacher initials:</u></p> <p>Date:</p> <p>Problem solving / T&R:</p> <ul style="list-style-type: none"> <input type="radio"/> Problem solved with minimal or non-mathematical prompting <input type="radio"/> Some leading questions were used to prompt thinking <input type="radio"/> Solved after explanation <input type="radio"/> Did not work out solution <input type="radio"/> N/A- not a novel problem <p>Reasoning / Comm.: (verbal, written, working and equations, or visual representations)</p> <ul style="list-style-type: none"> <input type="radio"/> Clearly and logically reasoned <input type="radio"/> Easily understood <input type="radio"/> Understood with some interpretation needed <input type="radio"/> Some gaps but on topic <input type="radio"/> Minimal or off topic <p>Understanding / Reflect:</p> <ul style="list-style-type: none"> <input type="radio"/> Connected manipulation problems to previous questions and answered easily <input type="radio"/> Connected manipulation problems to previous questions with some prompting, and answered correctly <input type="radio"/> Answered once the similarities to previous questions had been pointed out <input type="radio"/> Had some problems in answers but was on the right track <input type="radio"/> Did not answer appropriately <input type="radio"/> Student not observed
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Interleaved practise

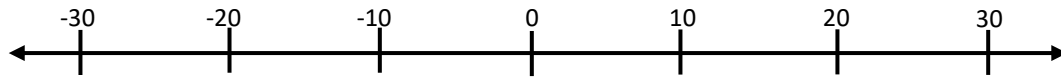
Year 7, week 5

Number:

1. Complete the table below

Index Notation	Product	Numeral
10^2		100
	$10 \times 10 \times 10$	
		10 000
10^5		
	$10 \times 10 \times 10 \times 10 \times 10 \times 10$	

2. Show where these numbers would go on the number line: -6, 12, -24, 9, -15



3. Write the next 3 numbers for this pattern of square numbers. How do you know they are square numbers?

4, 9, _____, _____, _____

4. Circle the note or notes would you use to pay for the following items so that you receive the least amount of change?

Milk \$3.59, eggs \$4.50, bread \$2.30, apples \$5.90, orange juice \$5.27 and cereal \$3.75



Hint: You don't need to work out the exact amount so consider rounding.

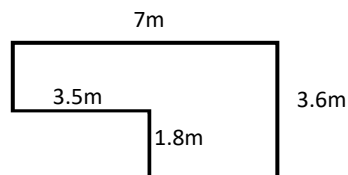
5. True or False? Explain your thinking

$$11(x + 37) = 11x + 407$$

Measurement/Geometry:

6. On the back of this page, draw and label an example of each of the following types of angles - **acute**, **obtuse**, **right** and **reflex** angles

7. This is a drawing of the coop I am building for my chickens. What length of chicken wire will I need to buy to enclose it?



8. How many litres of water will I have to take on a camping trip to allow for 90 cups of water if my cups hold 275mL?

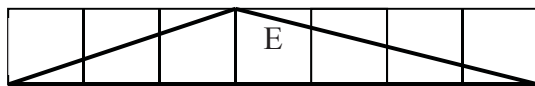
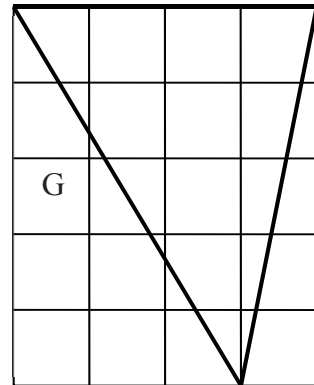
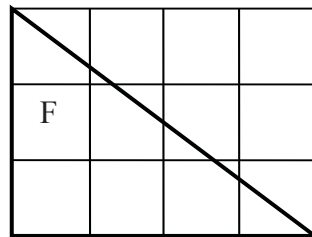
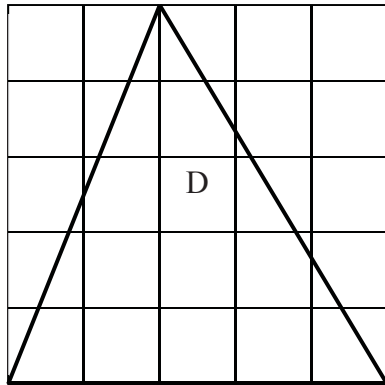
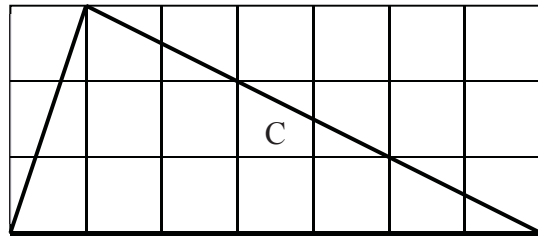
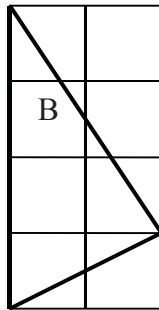
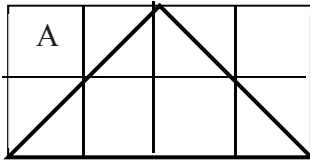
Chance/Data:

9. The solar panels on my house produced the following amount of electricity. What is the average amount of electricity produced per month?

Period	Kilowatts (kW)
Jan-April	1866 kW
April-July	1595 kW
July-Oct	1222 kW
Oct-Jan	1697 kW

E6. Finding the area of a triangle

The area of a triangle is related to the area of a rectangle. Use the following questions to help you formulate a rule for finding the area of a triangle.



Shape	Base of rectangle and triangle	Height of rectangle and triangle	Area of rectangle	Rule for area of rectangle	Area of triangle (counted)	Pattern between rectangle and triangle
A						
B						
C						
D						
E						
F						
G						

What is the rule for finding the area of a triangle?

BACKWARDS QUESTION:

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