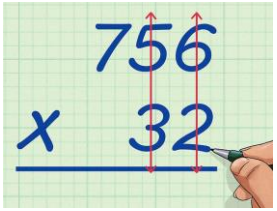
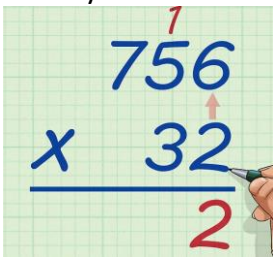
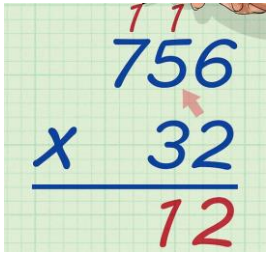
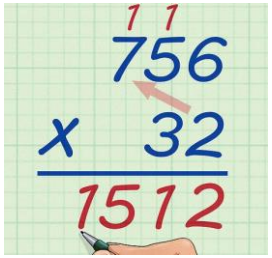
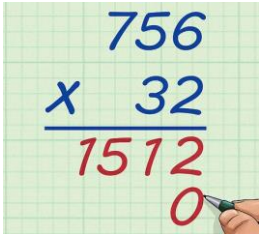
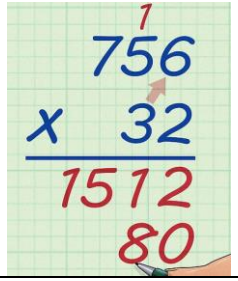
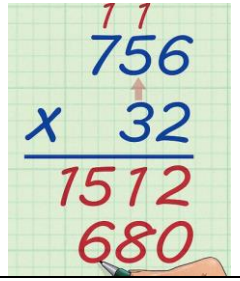
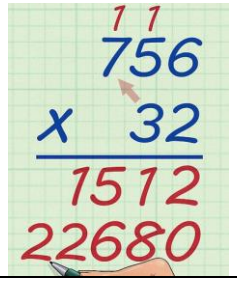
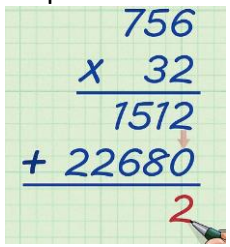
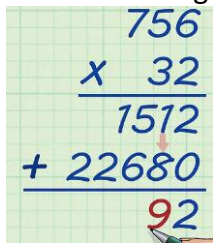
Stage 5 Knowledge Organiser (Corbett Maths video numbers in brackets)

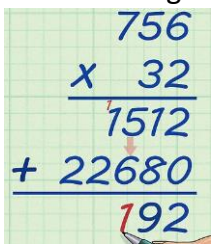
1. Multiply and divide large numbers (199, 200, 98)
2. Negatives in a temperature context (209)
3. Give the first 5 multiples of a number (220)
4. List the factors of a number using multiplication facts (216)
5. List the first 10 prime numbers (225)
6. List the first 10 square numbers (226)
7. Use common denominators to compare fractions (135 & 144)
8. Convert decimals to fractions using column headings (123)
9. Convert percentages to fractions (122)
10. Convert fractions to percentages (factors of 100 denominators) (126)
11. Reflect a shape in a horizontal or vertical line (272)
12. Find perimeter and area of rectilinear shapes on a grid (242, 43)
13. Find volume by counting cubes
14. Know definitions of angle types (38)
15. Know metric length conversions (349a)
16. Construct an accurate bar chart (147)
17. Read and use 24 hour time (322)
18. Use straight line and around a point angle rules (35, 30)
19. Identify and sketch the net of a cube (4)
20. Read a timetable (320)

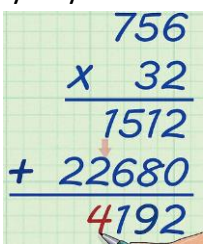
Skill	Method	Keywords/Definitions
501	Multiplication Example: Multiply 756 by 32 Step 1 – Write the larger number above the smaller number making sure the columns (tens, hundreds etc) line up, so the 5 will be above the 3 as they are both tens.  Step 2 – Multiply each digit of the top number by the digit in the ones column of the bottom number (the 2 in this case). Write your answers underneath, carrying across to the next column if your answer goes over 10.    Do this until you have multiplied each digit on the top row by the ones digit of the bottom number. Step 3 – You are now going to move onto multiplying by the tens column of the bottom number (the 3), so to represent that you're now multiplying by tens put a zero in the ones column on the next line.  Step 4 – Multiply each digit in the top row by the digit in the tens column of the bottom row (the 3 in this case)    	

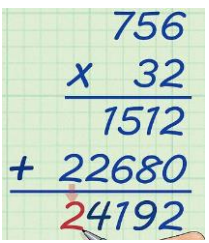
Step 5 – Add the two numbers together and this gives you your answer

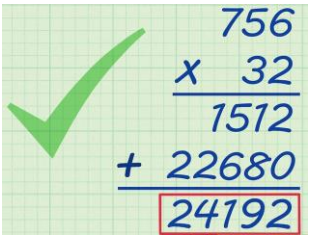






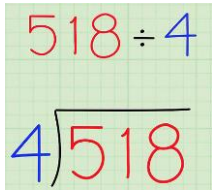




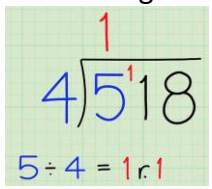


Division Example: Divide 518 by 4

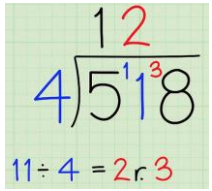
Step 1 – Put the number you are dividing by (the divisor) outside the bus stop and the number being divided (the dividend) inside the bus stop



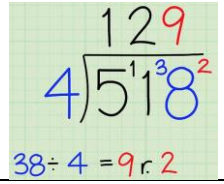
Step 2 – Divide the first digit of the dividend by your divisor (how many times does 4 go into 5?) Write your answer on top of the first digit and write any remainders in the next column as an added digit.



Step 3 – Divide the remainder and second digit of the dividend (how many times does the 4 go into 11?) Write your answer above the second digit of the dividend and write any remainders as an added digit in the next column.

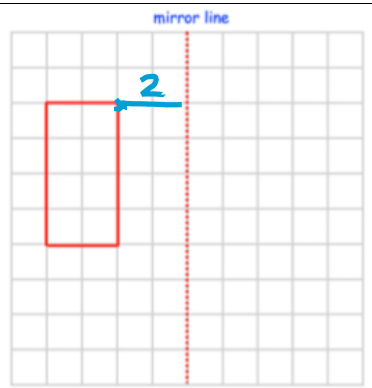


Step 4 – Repeat this process until you've reached the end of your dividend.

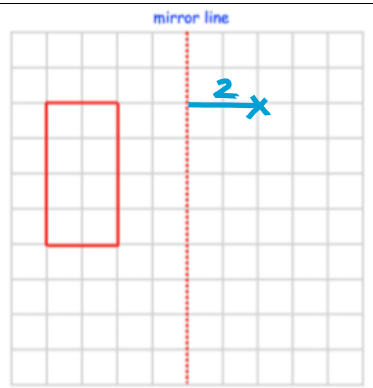


502	Negatives Example: If the temperature is -3°C and rises 12°C what is the new temperature?  Use the number line above to picture questions like this. If you are increasing you move to the right, if you are decreasing you move to the left. So start at -3 and go up (to the right) 12 times. Where do you end up? You should get 9°C	Negative numbers are numbers below zero.
503	Give the first 5 multiples of a number Example: Give the first 5 multiples of 6 Multiples of 6 are the numbers in the 6 times table. So, the first 5 multiples of 6 are: 6, 12, 18, 24 and 30.	Multiples of a number are found by multiplying the number by another whole number.
504	Listing Factors Factors of a number can divide equally into that number. The best way to find all the factors of a number is to find factor pairs: times table multiplication facts that give the number. Example: List all the factors of 24 1x24 2x12 3x8 4x6. So, the factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24	Factors of a number can divide equally into that number
505	List the first 10 Prime Numbers Learn these like another times table: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 Notice: 1 is NOT a prime number as it only has 1 factor, not 2!	Prime numbers are number with only two factors; themselves and 1
506	List the first 10 Square numbers Learn these like another times table: 1. 4. 9. 16. 25. 36. 49. 64. 81. 100 1x1. 2x2 3x3 4x4. 5x5. 6x6. 7x7. 8x8. 9x9. 10x10	Squaring a number means multiplying it by itself
507	Use common denominators to compare fractions Example: which is bigger $\frac{3}{5}$ or $\frac{4}{7}$? The denominators here are 5 and 7. Multiply the $\frac{3}{5}$ by $\frac{7}{7}$ and the $\frac{4}{7}$ by $\frac{5}{5}$ (this is also known as cross multiplying, you are generating equivalent fractions here).	Denominator- number on the bottom of a fraction Numerator- number of top of a fraction

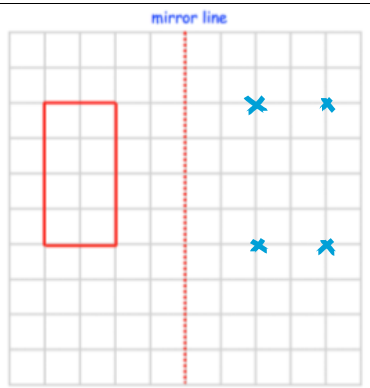
	This gives the fractions $\frac{21}{35}$ and $\frac{20}{35}$ so the $\frac{21}{25}$ is the bigger one (which was originally the $\frac{3}{5}$)	
508	Convert decimals to fractions **Place value chart** Moving left, each column is 10 x bigger than the one before. Moving right, each column is 10 x smaller than the one before. Millions | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Units | Decimal point | Tenths | Hundredths | Thousandths M | HTh | TTh | Th | H | T | U | • | $\frac{1}{10^{th}}$s | $\frac{1}{100^{th}}$s | $\frac{1}{1000^{th}}$s Each column after the decimal point can be thought of as a fraction. Find the column your decimal number finishes in and then write the digits over that column. Example: Convert 0.317 to a decimal. The final digit here is the 7, this is in the $\frac{1}{1000}$s column so this would be $\frac{317}{1000}$ as a fraction	
509	Convert percentages to fractions Percentages are always out of 100, so to convert a percentage to a fraction simply write it over 100 then simplify the fraction if possible. Example: convert 18% to a fraction 18% = $\frac{18}{100}$ which simplifies to $\frac{9}{50}$	Percent means 'out of 100'
510	Convert fractions to percentages You need to multiply the denominator to change it into 100, then whatever you have multiplied by do the same to the numerator. Example: Convert $\frac{12}{25}$ into a percentage The denominator is 25 so we'd need to multiply by 4 to get it to 100, so multiply the numerator by 4 as well which gives us 48%	
511	Reflect a Shape in a Vertical or Horizontal Mirror Line Count the squares from each corner to the mirror line, then count the same number of squares the other side of the mirror line. Examples:	Mirror Line – the line in which the shape is reflected



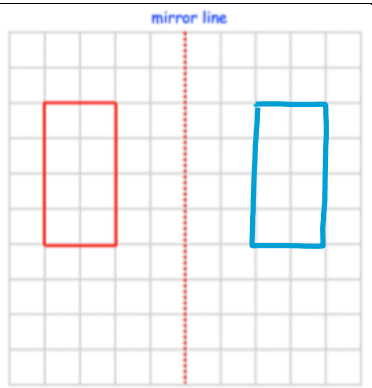
Count squares from a corner To the mirror line



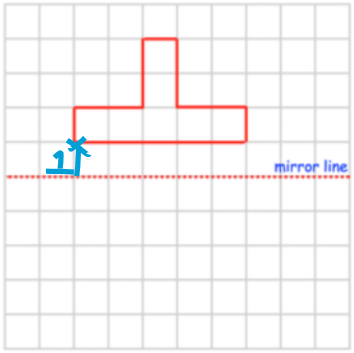
Count the same number of squares on the other side

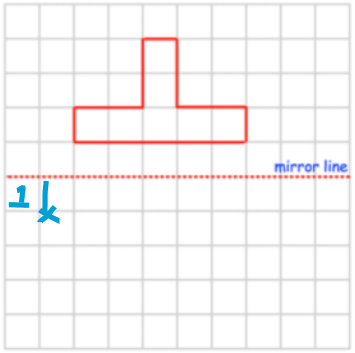


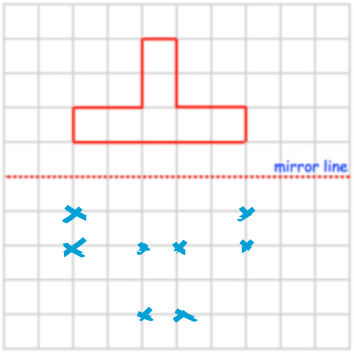
Repeat for all corners

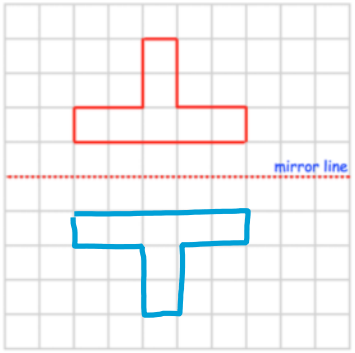


Draw in the reflected shape









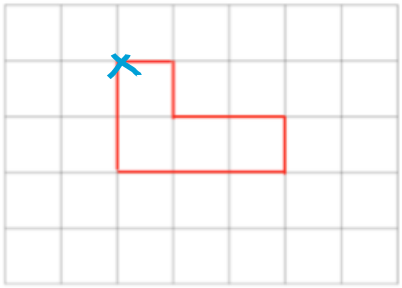
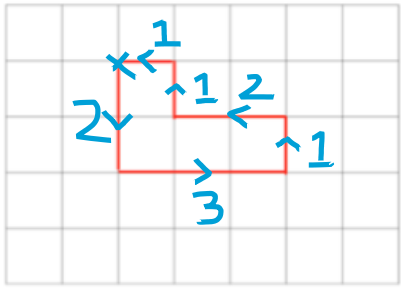
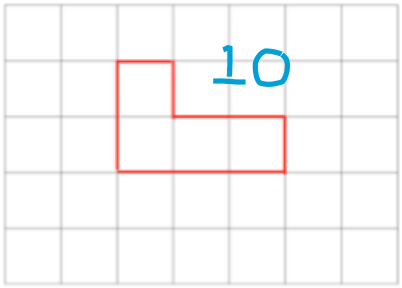
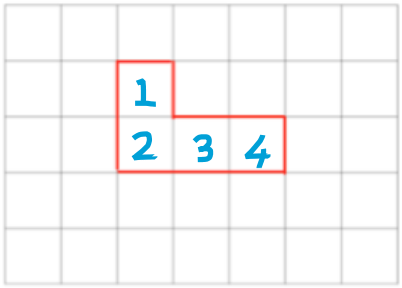
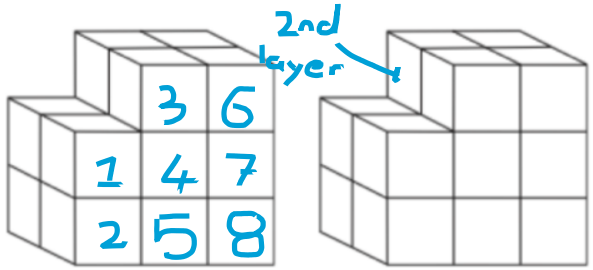
512

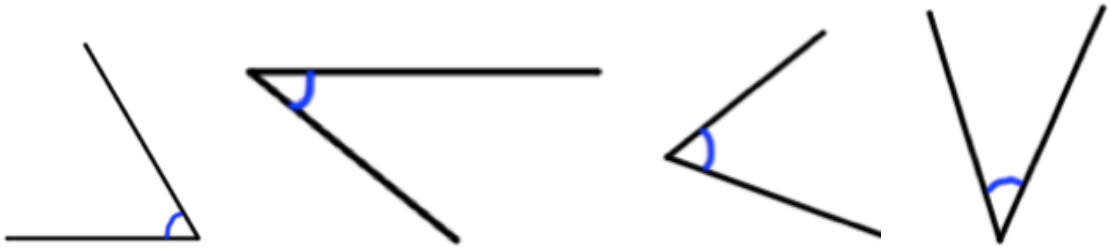
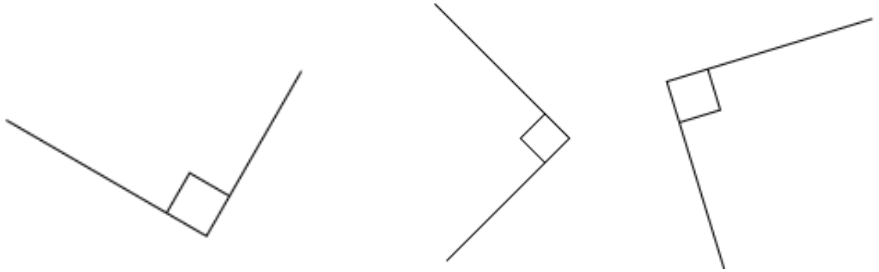
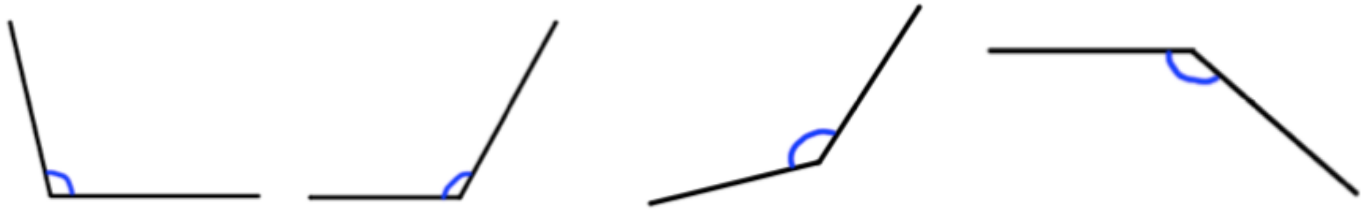
Find Perimeter and Area of Shapes on a Grid

To find perimeter, choose a corner to start from and count around the outside of the shape until you get back to where you started from.
To find area, count the total number of squares inside the shape.

Example: Find the Perimeter and Area of the following shape

Perimeter means the total distance around the outside of the shape.
Area means the 2D space inside the shape.
Units for Perimeter will be cm, m ,mm etc as it is a 1D distance
Units for Area will be square units as it is a

	   For perimeter, choose a corner to start from, go around the shape counting units as you go. The perimeter is 10cm  For area, count the total number of squares inside the shape. The area is 4cm^2	2D measurement cm^2 mm^2 m^2 etc
513	Find Volumes of Prisms by Counting Cubes To find the volume count the cubes, but make sure you take into account any that the diagram may not show. Example: Find the volume of this prism  As we're told this is a prism, we know that the 2nd layer back must have the same number of cubes as the front layer. As there are 8 cubes making up the front layer, we can double this to find that the volume of this prism is 16cm^3.	Volume is the 3D space a shape takes up. Volume is measure in cubed units cm^3 m^3 etc. Once cm^3 is a cube made up of 1cm lines. A prism is a 3D shape with the same shape running through it.
514	Know the Definitions of the Angle Types There are four angle types that you need to know:	Angles are measures of turn or rotation. In English the word acute can mean both

	Acute angles – these lie between 0 and 90 degrees  Right angles – exactly 90 degrees (always shown by having a box in the corner of the angle)  Obtuse angles – these lie between 90 and 180 degrees  Reflex angles – these lie between 180 and 360 degrees 	sharp or piercing; or clever and insightful. If two lines meet at a right angle they are called perpendicular lines. In English the word obtuse actually means 'slow witted' or 'stupid'.

<table>
<tr>
<td>515</td>
<td>Know the Metric Length Conversions

Learn these:
10mm = 1cm
100cm = 1m
1000m = 1km</td>
<td>Metric systems are nased around groups of 10, 100, 1000 etc
Metric units are ones that you can put kilo or milli in front of.</td>
</tr>
<tr>
<td>516</td>
<td>Construct an Accurate Bar Chart

Bar charts are easy to draw, but they are also easy to not draw accurately.
Things to remember:
• Label your axis (frequency up the side)
• Bars need to be the same width
• Leave an equal space between bars (other subjects may tell you this doesn’t matter but it does!)
• Title
• Make sure the numbers up the side are equally spaced as well

Example: Draw an accurate bar chart from the frequency table below showing the shoe size of students in year 6.
<table><tr><th>Shoe Size</th><th>Frequency</th></tr><tr><td>4</td><td>12</td></tr><tr><td>5</td><td>10</td></tr><tr><td>6</td><td>3</td></tr><tr><td>7</td><td>1</td></tr></table></td>
<td></td>
</tr>
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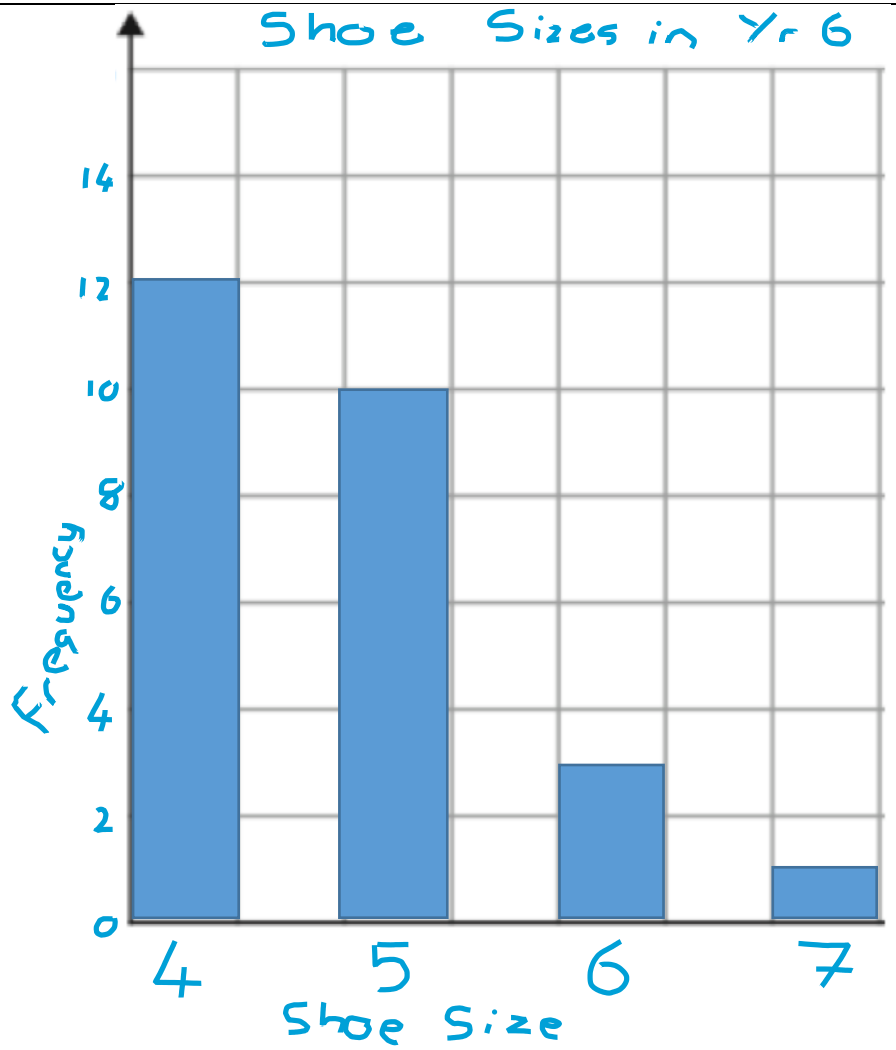
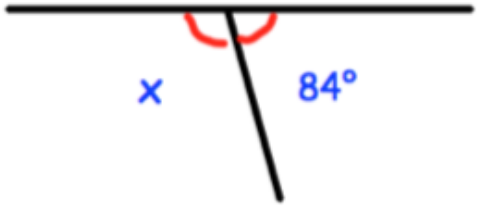
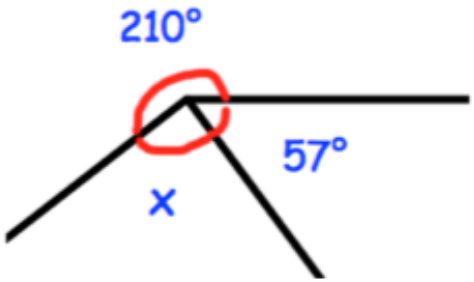
		
517	Read and Use 24 Hour Time The first 12 hours of the day (the morning) are given sometimes as 'am' times and the secodn12 hours (the afternoon and evening) are given as 'pm' times but these second 12 hours can also be given using 24 hour time, to find what that would be in pm, simply subtract 12 from the hours. Example:	The 24 hours in a day are split into two lots of 12 hours: the morning and the afternoon/evening.

	Write 21:40 in am/pm time the hours here are 21, so take 12 away from that and its 9:40pm Write 10:12pm in 24 hour time This time we need to add 12 hours on, so we get 22:12	
518	Use Straight Line and Around a Point Angle Rules Angles meeting on a straight line always add up to 180° Angles meeting at a point always add up to 360° Examples: Find the missing angle x  The two angles, x and 84 meet on a straight line. So, doing 180° – 84° = 96° So, x = 96°  The three angles (x, 210° and 57°) all meet at a point. So, doing 360° – 210° – 57° = 93° So, x = 92°	
519	Identify and Sketch the Net of a Cube A net is a shape that will fold up to make a complete 3D shape without any overlapping. A cube has 6 faces that are all squares so the net of a cube must be made up of 6 squares. You will need to imagine folding the shape up and see if it makes a full cube. Sketching: The easiest net to remember is the one that looks like a cross, but there are others. 	
520	Read a Timetable The thing to remember with a timetable is that it reads down. If you read it across it just shows the same stop happening every hour or so, that wouldn't get anyone anywhere!!	

Southville	09 20	10 30	12 10
Leek	09 48	10 58	12 38
Milton	09 55	11 05	12 45
Newtown	10 10	11 20	13 00
Red Island	10 19	11 29	13 09
Sandville	10 45	11 55	13 35
Bakerstown	11 01	12 11	13 51

The above timetable shows 3 different trains, all starting from Southville and Ending in Bakerstown.

Example: I arrive at the Milton station at 1100 and want to get to Sandville. What is the earliest time I can get to Sandville?

If we arrive at Milton at 1100 the next train at that point is the 1105

Southville	09 20	10 30	12 10
Leek	09 48	10 58	12 38
Milton	09 55	11 05	12 45
Newtown	10 10	11 20	13 00
Red Island	10 19	11 29	13 09
Sandville	10 45	11 55	13 35
Bakerstown	11 01	12 11	13 51

If we get this train, we can see we will arrive at Sandville at 1155

Southville	09 20	10 30	12 10
Leek	09 48	10 58	12 38
Milton	09 55	11 05	12 45
Newtown	10 10	11 20	13 00
Red Island	10 19	11 29	13 09
Sandville	10 45	11 55	13 35
Bakerstown	11 01	12 11	13 51