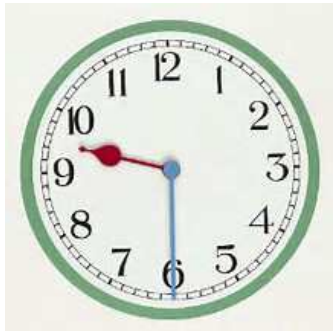


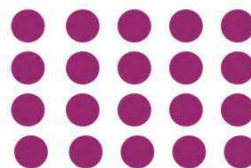
Vocabulary:	Definition:	Guidance:
Addend	A number to be added to another.	For example: In $5 + 3 = 8$, the addends are 3 and 5.
Addition	The operation of addition adds one number to another number to form a third number. The result of the addition is called the sum or total. The operation is represented by the + sign. <u>Commutative</u> The order of addition does not matter. This holds for all pairs of numbers and therefore the operation of addition is said to be commutative. <u>Adding three numbers</u> To add three numbers together, first two of the numbers must be added and then the third is added. <u>Inverse operations</u> Addition is the inverse operation to subtraction, and vice versa. There are two models for addition: Addition as augmentation (growing) Augmentation is when one quantity or measure is increased by another quantity. Addition as aggregation (gathering) Aggregation is the combining of two quantities or measures to find the total.	For example: When we write $5 + 3$ we mean 'add 3 to 5'. The total or sum is 8. The answer to $5 + 3$ is equal to $3 + 5$ and in both cases the sum is 8. For example, $5 + 3 + 4$ means 'add 3 to 5 and then add 4 to the result' to give an overall total of 12. $5 + 3 = 8$ therefore we know that $8 - 3 = 5$ and $8 - 5 = 3$. "My plant was 17cm tall. It grew 2cm taller. Then it was 19cm tall." "I had £3 and my friend had £1, we had £4 altogether."
Algebra	The part of mathematics that deals with generalised arithmetic. Letters and symbols are used to represent unknown numbers.	For example: $8 = 5 + \triangle$ What value does $\triangle$ represent?
Analogue Clock	A clock usually with 12 equal divisions labelled 'clockwise' from the top 12, 1, 2, 3 and so on up to 11 to represent hours. The clock has two hands that rotate about the centre. The minute hand completes one whole turn in one hour, whilst the hour hand completes one whole turn in 12 hours.	

Anticlockwise

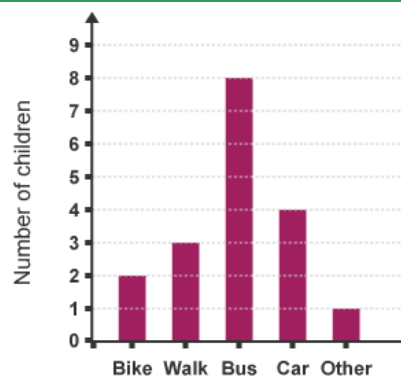
In the opposite direction from the normal direction of travel of the hands of an analogue clock.

**Array**

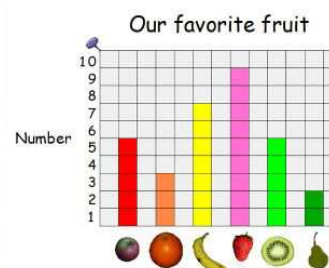
An arrangement of objects in rows and columns.

**Bar Chart**

A diagram representing statistical information. Bars, of equal width, represent frequencies and the lengths of the bars are proportional to the frequencies (and often equal to the frequencies). Sometimes called bar graph. The bars may be vertical or horizontal depending on the orientation of the chart.

**Block Graph**

A diagram for representing statistical information. One block represents one observation.

**Capacity**

Capacity is the maximum volume of a material usually liquid, held in a container.

Note: the term 'volume' is used as a general measure of 3-dimensional space and cannot always be used synonymously with capacity. For example: the volume of a cup is the space taken up by the actual material of the cup (a metal cup melted down would have the same volume); whereas the capacity of the cup is the volume of the liquid or other substance that the cup can contain. A solid cube has a volume but no capacity.

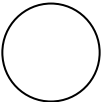
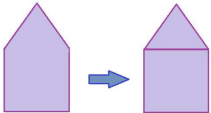
Units include litres (l) and millilitres (ml).

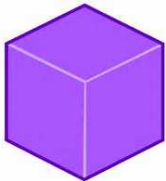
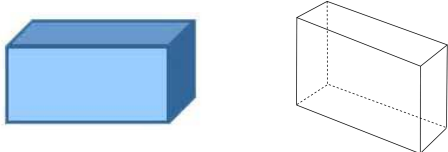
**Cardinal Number**

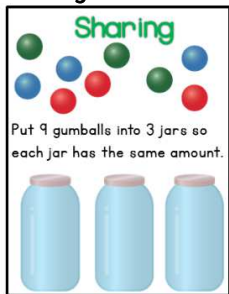
A cardinal number represents quantity, as opposed to an ordinal number which represents position within a series.

For example:

1, 2, 5, 23 are examples of cardinal numbers
First (1st), second (2nd), third (3rd) etc. represent position in a series, and are ordinal numbers.

Carroll Diagram	A sorting diagram in which numbers or objects are classified as having a certain property or not having that property. Odd numbers Even numbers Less than 10 Not less than 10 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	
Categorical Data	Data arising from situations where categories are used.	For example: pets, pupils' favourite colours etc.
Centi-	Prefix meaning one-hundredth (of).	
Centilitre	Symbol: cl. A unit of capacity or volume equivalent to one-hundredth of a litre.	
Centimetre	Symbol: cm. A unit of linear measure equivalent to one hundredth of a metre.	
Chart	Another word for a table or graph.	
Chronological	Relating to events that occur in a time ordered sequence.	
Circle	A round 2D shape with one curved, continuous edge. Half of a circle is a semi-circle.	
Clockwise	In the direction in which the hands of an analogue clock travel. Anti-clockwise or counter-clockwise are terms used for the opposite direction.	
Commutative	An operation which can be completed in any order. See addition and multiplication.	
Compare	When two entities (objects, shapes, curves, equations etc.) are compared by looking for points of similarity and difference as far as mathematical properties are concerned.	
Compensation	A mental or written calculation strategy where one number is rounded to make the calculation easier. The calculation is then adjusted by the appropriate amount.	For example: $56 + 38$ is treated as $56 + 40$ and then 2 is subtracted to compensate. $67 - 39$ is treated as $67 - 40$ and then 1 is added to compensate.
Composite Shape	A shape formed by combining two or more shapes.	

Concrete Objects	Objects that can be used to support understanding of a mathematical concept. Materials such as dienes and cubes, Numicon and pattern blocks are all examples of concrete objects.	
Cone	A cone is a 3D shape consisting of a circular base, a vertex in a different plane and line segments joining all the points on the circle to the vertex.	
Conjecture	An educated guess of a particular result, which is as yet unverified.	
Consecutive	Following in order. Consecutive numbers are adjacent in a count.	For example: 5, 6, 7 are consecutive numbers. 25, 30, 35 are consecutive multiples of 5.
Continuous Data	Data arising from measurements taken on a continuous variable.	For example: lengths of caterpillars, weight of crisp packets etc.
Count (verb)	The act of assigning one number name to each of a set of objects (or sounds or movements) in order to determine how many objects there are. In order to count reliably children need to be able to: • Understand that the number words come in a fixed order • Say the numbers in the correct sequence • Organise their counting (say one number for each object and keep track of which things they have counted) • Understand that the final word in the count gives the total • Understand that the last number of the count remains unchanged irrespective of the order (conservation of number).	
Counter Example	Where a hypothesis or general statement is offered, an example that clearly disproves it.	For example: Statement: An odd number added to an even number will total an even number. Counter Example: $3 + 4 = 7$, 7 is not an even number therefore the statement is disproved.
Cube	A 3D shape with six identical, square faces. Adjoining edges and faces are at right angles.	
Cuboid	A 3D shape with four rectangular faces and two square faces. The term cuboid is also commonly used to describe a rectangular prism which is a 3D shape with six rectangular faces.	

Cylinder	A 3D shape with two circular faces and one curved face joining them.	
2D; 3D	Short for 2-dimensional and 3-dimensional. A figure is two-dimensional if it lies in a plane. A solid is three-dimensional and occupies space (in more than one plane).	
Data	Information of a quantitative nature consisting of counts or measurements. Singular: datum.	
Denomination	The face value of coins. The smallest denomination of UK currency (known as sterling) is 1p and the largest denomination of currency is a £50 note.	
Diagram	A picture, a geometric figure or a representation.	
Difference	In mathematics (as distinct from its everyday meaning), difference means the numerical difference between two numbers or sets of objects and is found by comparing the quantity of one set of objects with another.	For example: The difference between 12 and 5 is 7; 12 is 5 more than 7 or 7 is 5 fewer than 12. Difference is one way of thinking about subtraction and can, in some circumstances, be a more helpful image for subtraction than 'take-away' – e.g. 92 – 88.
Digit	One of the symbols of a number system most commonly the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.	For example: The number 4 is a single digit. The number 29 is a 2-digit number. The position or place of a digit in a number conveys its value. In 29, the digit 2 represents two tens and the digit 9 represents nine ones.
Digital Clock	A clock that displays the time as hours and minutes passed, usually since midnight.	For example: Four thirty in the afternoon is displayed as 16:30. 
Direction	The orientation of a line in space.	For example: North, South, East, West, up, down, right, left are all directions.
Dividend	In division, the number that is divided.	For example: In $15 \div 3 = 5$, 15 is the dividend.
Division	There are two models for solving division calculations: <u>Sharing</u> Division can be sharing – the number to be divided is shared equally into the stated number of parts.	For example: Division as sharing 

Grouping

Division can be grouping – the number of groups of a given size from a dividend.

Division as grouping



Division is the inverse operation to multiplication.

Double

The number or quantity that is twice another.

For example:
14 is double 7.

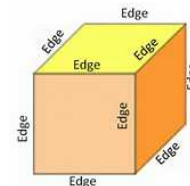
A 'near double' is one away from a double. Spotting near doubles can be a useful mental calculation strategy.

Seeing $25 + 26$ as one more than double 25.

Edge

A line segment joining two vertices of a shape. A line segment where two faces meet.

For example:
A square has four edges and a cuboid has twelve edges.



Equal

Symbol: =
Read as 'is equal to' or 'equals' and meaning 'having the same value as'.

For example:
 $7 - 2 = 4 + 1$
because both expressions ($7 - 2$ and $4 + 1$) have the same value of 5.

Equivalent Fractions

Fractions with the same value as another.

For example:
 $\frac{2}{4}$ and $\frac{1}{2}$ are equivalent fractions as they are equal.

Even Number

A number that is divisible by 2.

For example:
2, 4, 6, 8, 10, 26, 42, 80 are all even numbers.

Fluency

To be mathematically fluent one must have a mix of conceptual understanding, procedural fluency and knowledge of facts to enable them to tackle problems appropriate to their stage of development confidently, accurately and efficiently.

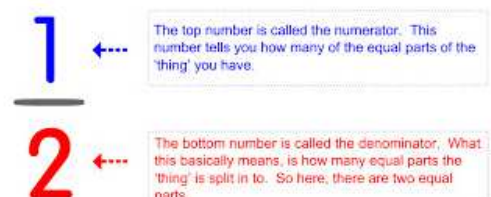
(The) Four Operations

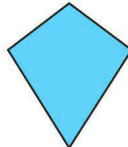
Common shorthand for the four arithmetic operations of addition, subtraction, multiplication and division.

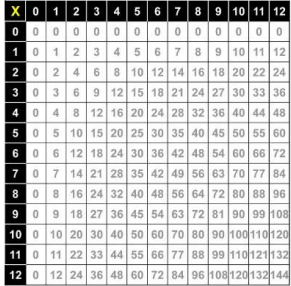
Fraction

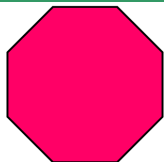
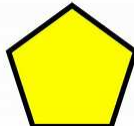
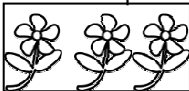
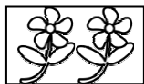
The result of dividing one number by a second number. The dividend is the numerator and the divisor is the denominator.

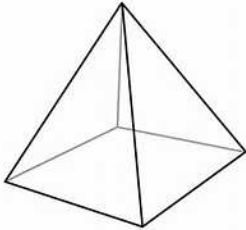
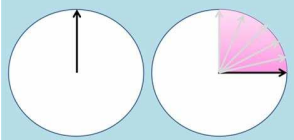
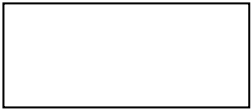
There are two numbers in a fraction:



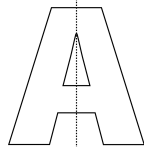
Frequency	The number of times an event occurs or the number of individuals (people, animals etc.) with some specific property.																																																																																																					
General Statement	A statement that applies correctly to all relevant cases.	For example: The sum of two odd numbers is an even number.																																																																																																				
Geometrical	Relating to geometry, the aspect of mathematics concerned with the properties of space and figures or shapes in space.																																																																																																					
Gram	Symbol: g. The unit of weight equal to one thousandth of a kilogram.																																																																																																					
Hexagon	A 2D shape with six sides. Adjective: Hexagonal.																																																																																																					
Hour	Symbol: h. A unit of time. One twenty-fourth of a day. 1 hour = 60 minutes = 3600 (60 x 60) seconds.																																																																																																					
Hundred Square	A 10 by 10 square grid numbered 1 to 100.	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr><tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr><tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr><tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr><tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr><tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr><tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr><tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr></table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Inequality	When one number, or quantity, is not equal to another. The inequality signs in use are: ≠ means 'not equal to' < means 'less than' > means 'greater than'	For example: 2 ≠ 3 20<50 50>39																																																																																																				
Infinite	A number always bigger than any (finite) number that can be thought of. A sequence or set, going on forever.																																																																																																					
Kite	A 2D, four-sided shape with two pairs of equal, adjacent sides whose diagonals consequently intersect at right angles.																																																																																																					
Length	The extent of a line segment between two points.																																																																																																					
Line	A set of adjacent points that has length but no width.																																																																																																					
Litre	Symbol: l. A metric unit used for measuring capacity. A litre is equivalent to 1000ml.																																																																																																					
Mass	A characteristic of a body, relating to the amount of matter within it. In a constant gravitational field weight is proportional to mass. See weight.																																																																																																					

Maximum Value (in a non-calculus sense)	The greatest value.	For example: The maximum temperature in London yesterday was 18oC.
Measure	1. The size in terms of an agreed unit. 2. Measure is also used as a verb, meaning to find the size.	
Measuring Tools	A tool used to measure, often using a scale.	For example: A ruler measures length A thermometer measures temperature Weighing scales measure mass A stop watch measures time
Mental Calculation	Referring to calculations that are largely carried out mentally, but may be supported with a few simple written jottings.	
Multiple	Multiples of a number are the totals made after that number is multiplied.	For example: 14, 8 and 4 are all multiples of 2 because $14 = 2 \times 7$ $8 = 2 \times 4$ $4 = 2 \times 2$
Multiplicand	A number multiplied by another number.	In 5×3 , 5 is the multiplicand as it is the number to be multiplied by 3.
Multiplication	Multiplication (often denoted by the symbol "x") is the mathematical operation of scaling one number by another. <u>Repeated addition</u> Multiplication can be worked out using repeated addition. <u>Inverse</u> Multiplication is the inverse operation of division. <u>Commutative</u> Multiplication is commutative.	For example: 5 multiplied by 3 (often said as "5 times 3 or 5, 3 times") can be calculated by adding 3 copies of 5 together: $5 \times 3 = 5 + 5 + 5 = 15$ Here 5 and 3 are the "factors" and 15 is the "product". $5 \times 3 = 15$ Therefore, $15 \div 3 = 5$ and $15 \div 5 = 3$ 5×3 is equal to 3×5 and in both cases the sum is 15.
Multiplication Table	An array setting out sets of numbers that multiply together to form the entries in the array.	
Multiply	Carry out the process of multiplication.	
Number Bond	A pair of numbers which have a particular total when added together.	For example: Number bonds to ten are all pairs of whole numbers with the total 10. $1 + 9 = 10$ $2 + 8 = 10$ etc.

Number Line	A line where numbers are represented by points upon it.	
Number Sentence	A mathematical sentence involving numbers.	For example: $3 + 6 = 9$ $2 \times 10 = 20$
Numeral	A symbol used to represent a number.	For example: The numerals 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are widely used to represent numbers today. The Roman numerals I, V, X, L, C, D and M represent the numbers one, five, ten, fifty, one hundred, five hundred and one thousand.
Octagon	A 2D shape with eight sides. Adjective: octagonal, having the form of an octagon.	
Operation	A rule for combining two numbers to produce a third number. Addition, subtraction, multiplication and division are all operations.	$+$ $-$ $\times$ $\div$
Ordinal Number	A term that describes a position within an ordered set.	For example: 1 st first, 2 nd second, 3 rd third, 4 th fourth ... 20 th twentieth etc.
Partition	To split a number into parts.	For example: The single-digit number 12 can be partitioned into 10 + 2 or 9 + 3 or 4 + 4 + 4 etc. The two-digit number 38 can be partitioned into 30 + 8 or 19 + 19 or 20 + 10 + 8 etc.
Pattern	A systematic arrangement of numbers, shapes or other elements according to a rule.	
Pentagon	A 2D shape with five sides. Adjective: pentagonal, having the form of a pentagon.	
Pictogram	A diagram for representing statistical information. Suitable pictures, symbols or icons are used to represent objects. For large numbers one symbol may represent a number of objects and a part symbol then represents a rough proportion of the number.	
Pictorial Representations	Pictorial representations enable learners to use pictures and images to represent the structure of a mathematical concept. The pictorial representation may build on the	For example:   Here 3 add 2 is being represented using pictures of

	familiarity with concrete objects.	flowers. $3 \text{ flowers} + 2 \text{ flowers} = 5 \text{ flowers}.$
Place Value	The value of a digit that relates to its position or place in a number.	For example: In 14 the digits represent 1 ten and four ones respectively. In 124 the digits represent 1 hundred, 2 tens and 4 ones respectively.
Plus	A name for the symbol +, representing the operation of addition.	
Position	Location.	
Pound (sterling money)	Symbol: £. A unit of money. $£1.00 = 100 \text{ pence}.$ £1 is commonly called a pound.	
Product	The result of multiplying one number by another.	For example: The product of 2 and 3 is 6 since $2 \times 3 = 6.$
Property	Any attribute.	For example: One property of a square is that all its sides are equal.
Pyramid	A 3D shape with a base face and triangular faces that meet at the top. Pyramids are named according to the base: a triangular-based pyramid, a square-based pyramid, etc.	
Quadrilateral	A 2D shape with four sides.	
Quantity	Something that has a numerical value.	For example: 5 bananas.
Quarter Turn	A rotation through 90° , either clockwise or anticlockwise.	
Rectangle	A 2D shape with four sides. Opposite sides are equal and one pair is longer than the other pair.	
Relation, Relationship	A common property or association between two or more items.	
Repeated Addition	The process of repeatedly adding the same number or amount. See also multiplication.	For example: $5 + 5 + 5 + 5 = 5 \times 4.$
Rotation	In 2D, a transformation of the whole shape which turns about a fixed point, the centre of rotation.	
Row	A horizontal arrangement.	For example: A row of three chairs. 
Rule	A procedure for carrying out a process.	

Scale (noun)	A measuring device usually consisting of points on a line with equal intervals.	
Second	1. Symbol: s. A unit of time. One-sixtieth of a minute. 2. Ordinal number as in 'first, second, third, fourth ...'.	
Sequence	A succession of terms formed according to a rule. There is a definite relation between one term and the next and between each term and its position in the sequence.	For example: 2, 4, 6, 8, 10 etc. 1, 2, 4, 7, 11, 16 etc.
Set	A well-defined collection of objects.	
Side	A line segment that forms part of the boundary of a shape. Also edge.	
Sign	A symbol used to denote an operation.	For example: The addition sign is +, the subtraction sign is −, the multiplication sign is ×, the division sign is ÷, the equals sign is = etc.
Sort	To classify a set of entities into specified groups.	
Square	A 2D shape with four equal sides and four right angles.	
Standard Unit	Uniform units that are agreed throughout a community.	For example: The metre is a standard unit of length. The litre is a standard unit of capacity.
Subtract	Carry out the process of subtraction.	
Subtraction	Subtraction is the process of reducing/taking away one number or amount by/from another. The operation is represented by the − sign. Subtraction is the inverse operation to addition, and vice versa. Subtraction is not commutative which means if you change the order of the numbers being used it will give a different answer. There are two models for subtraction: Subtraction as decreasing (shrinking) This is when one quantity or measure is decreased by another quantity. Subtraction as taking away (removing) This is when one quantity is taken away or removed from another quantity or measure.	For example: When we write $5 - 3$ we mean '5 take away 3 or 5 reduced by 3'. The remaining amount is the answer so '$5 - 3 = 2$'. $5 - 3 = 2$ therefore we know that $2 + 3 = 5$ and $5 - 2 = 3$. The answer to $5 - 3$ is NOT equal to $3 - 5$. $5 - 3 = 2$ and $3 - 5 = -2$ "I built a snowman which was 65 cm tall. When the sun came out he started to melt. His height shrunk by 10cm. Then he was 55cm tall." "I have 10p. I spend 7p. I have 3p left."
Subtrahend	A number to be subtracted from another.	For example: In $15 - 5 = 10$, 5 is the subtrahend.

Sum	The total of one or more additions.	For example: The sum of 3 + 6 is 9.								
Surface	A set of points defining a space in two or three dimensions.									
Symbol	A letter, numeral or other mark that represents a number, an operation or another mathematical idea.	For example: The numerals 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are widely used to represent numbers today. The + sign represents the operation of addition.								
Symmetry	Something has symmetry if the effect of reflection or rotation is to produce an identical-looking figure in the same position. Adjective: symmetrical.									
Table	An orderly arrangement of information, numbers or letters usually in rows and columns.									
Takeaway	Remove a number of items from a set.									
Tally	Make marks to represent objects counted; usually by drawing vertical lines and crossing the fifth count with a horizontal or diagonal strike through. A Tally chart is a table representing a count using a Tally.	<table><tr><td>Larry</td><td> I</td></tr><tr><td>Bobby</td><td> </td></tr><tr><td>Tony</td><td> II</td></tr><tr><td>Linda</td><td> </td></tr></table>	Larry	I	Bobby		Tony	II	Linda	
Larry	I									
Bobby										
Tony	II									
Linda										
Temperature	A measure of the hotness/coldness of an object/the air. Temperature is usually measured by a thermometer or other form of heat sensor. Two common scales of temperature are the Fahrenheit scale (°F) and the Celsius (or centigrade scale) which measures in °C. These scales have reference points for the freezing point of water (0°C or 32°F) and the boiling point of water (100°C or 212°F).									
Time	1. Progress from past, to present and to future 2. Time of day, in hours, minutes and seconds; clocks and associated vocabulary 3. Duration and associated vocabulary 4. Calendar time in days, weeks, months, years 5. Associated vocabulary such as later, earlier, sooner, when, interval of time, clock today, yesterday, tomorrow, days of the week, the 12 months of a year, morning, a.m., afternoon, p.m., noon, etc.									
Total	1. The aggregate. 2. The sum found by adding.	For example: The total population is all in the population. The total of 5 + 3 is 8.								

Triangle	A 2D shape with three sides. Adjective: triangular, having the form of a triangle.	
Turn	A rotation about a point: a quarter turn is a rotation of 90° . A half turn is a rotation of 180° , a whole turn is a rotation of 360° .	
Vertex	The point at which two or more lines intersect. Plural: vertices.	
Volume	A measure of three-dimensional space. Usually measured in cubic units; for example, cubic centimetres (cm^3) and cubic metres (m^3).	
Weight	In KS1 the term weight is often used to describe the same concept as mass. In mathematics, and physics, the weight of a body is the force exerted on the body by gravity; however children in KS1 would not be expected to differentiate between weight and mass.	
Zero	Nought or nothing; zero is the only number that is neither positive nor negative.	