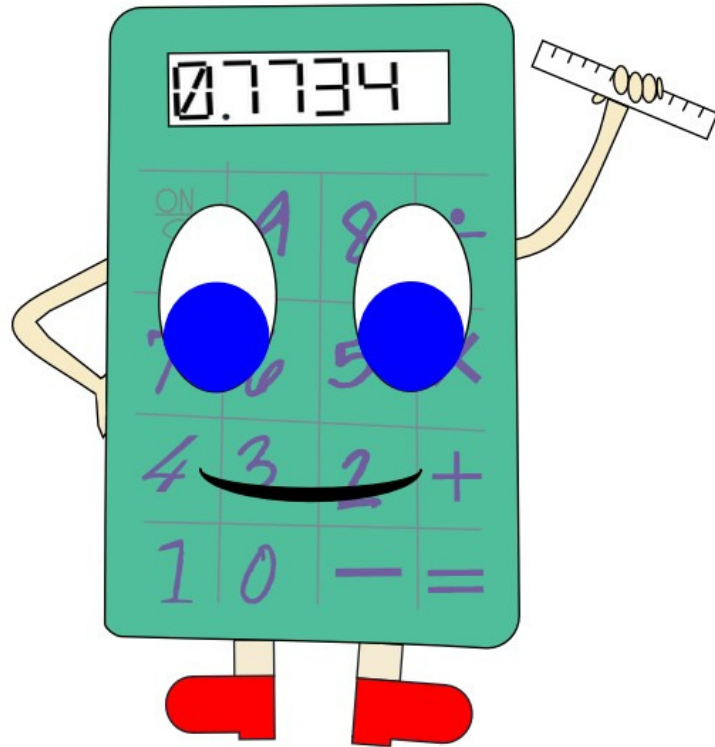


St Thomas of Aquin's RC High School



Helping your child achieve Level 3 Numeracy

Rounding

I can round decimals up to three decimal places.

254.125874

Nearest 100: **300**

Nearest 10: **250**

Nearest whole number: **254**

One decimal place: **254.1**

Two decimal places: **254.13**

Three decimal places: **254.126**

I can use rounding to help estimate the answers to calculations.

A bar of chocolate weighs 42g. There are 48 bars of chocolate in a box. What is the total weight of chocolate in the box?

Estimate = $50 \times 40 = 2000\text{g}$

Calculate: $42 \times 48 = 2016\text{g}$

Number and number processes

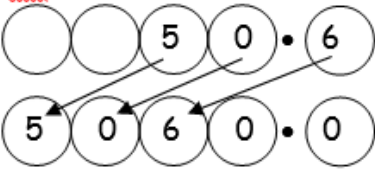
I can recall my times tables up to the twelve times table and use them to support with division.

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

I can add, subtract, multiply and divide decimals.

Subtract 6.9 from 145.97

$$\begin{array}{r}
 31 \\
 145.97 \\
 - 6.90 \\
 \hline
 139.07
 \end{array}$$

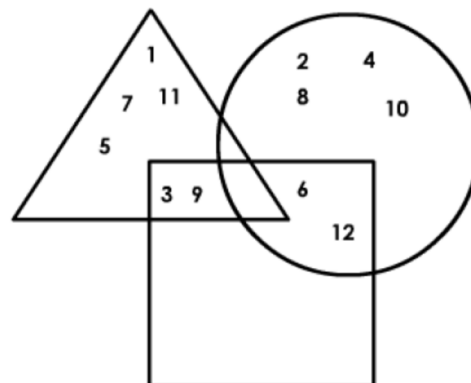
	<p style="text-align: center;">Multiply 50.6 by 100</p> <p style="text-align: center;"> Th H T U • + </p>  <p style="text-align: center;">$50.6 \times 100 = 5060$</p>
<p>I can add, subtract, multiply and divide negative numbers.</p>	<p>The temperature outside at 2pm was 3°C. During the next 12 hours, it falls by 6°C. What is the temperature at 2am?</p> <p style="text-align: center;">$3 - 6 = -3^{\circ}\text{C}$</p>
<p>I can identify multiples and factors.</p>	<p>Multiples of a number are all the numbers which it fits into exactly.</p> <p>For example, the multiples of 6 are 6, 12, 18, 24, 30, 36, ...</p> <p>Factors of a number are all the numbers which fit into it exactly.</p> <p>For example, the factors of 12 are 1, 2, 3, 4, 6 and 12.</p>
<p>I can identify prime numbers to 100 and can explain the method used.</p>	<p>Q: What is a prime number.</p> <p>A: A prime number can be divided evenly only by 1 or itself.</p>

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

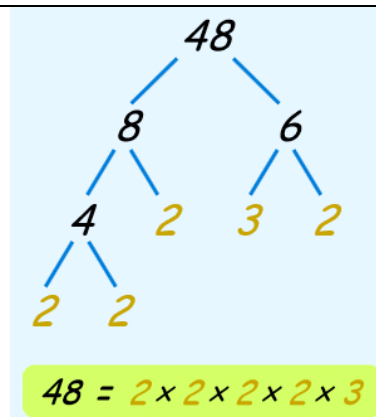
I can solve problems using multiples and factors.

Put the numbers 1 to 12 in the below diagram.

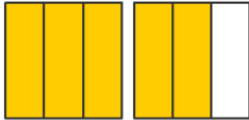

- Odd numbers must go into the triangle.
- Even numbers must go into the circle.
- Multiples of 3 must go into the square.



I can write a given number as a product of its prime factors.



Powers and roots	
I can define index, exponent and power.	Index, exponent and power all refer to the number of times a number is multiplied by itself.
I can evaluate whole number powers and express whole numbers as powers.	$2^3 = 2 \times 2 \times 2 = 8$ $4^2 = 4 \times 4 = 16$

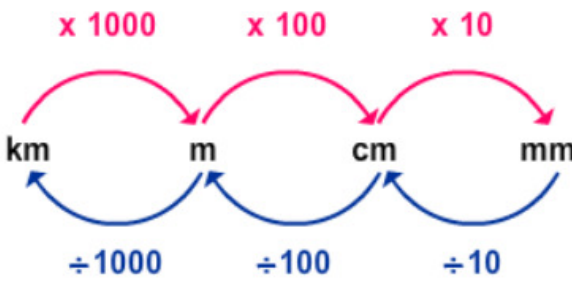
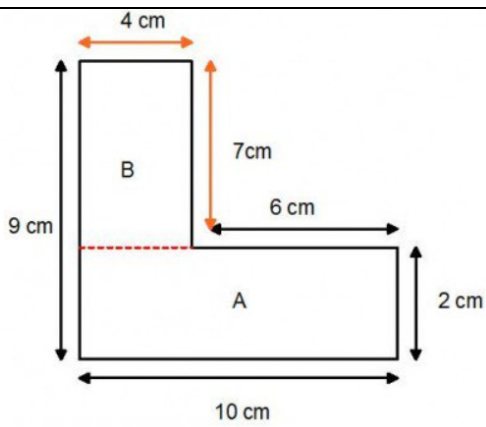
Fractions, decimal fractions and percentages																															
Convert fractions, decimal fractions and percentages to equivalent fractions, decimal fractions or percentages.	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>$\frac{1}{10}$</td> <td>$\frac{1}{5}$</td> <td>$\frac{3}{10}$</td> <td>$\frac{2}{5}$</td> <td>$\frac{1}{2}$</td> </tr> <tr> <td>0.1</td> <td>0.2</td> <td>0.3</td> <td>0.4</td> <td>0.5</td> </tr> <tr> <td>10%</td> <td>20%</td> <td>30%</td> <td>40%</td> <td>50%</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>$\frac{3}{5}$</td> <td>$\frac{7}{10}$</td> <td>$\frac{4}{5}$</td> <td>$\frac{9}{10}$</td> <td>1</td> </tr> <tr> <td>0.6</td> <td>0.7</td> <td>0.8</td> <td>0.9</td> <td>1.0</td> </tr> <tr> <td>60%</td> <td>70%</td> <td>80%</td> <td>90%</td> <td>100%</td> </tr> </table>	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{2}{5}$	$\frac{1}{2}$	0.1	0.2	0.3	0.4	0.5	10%	20%	30%	40%	50%	$\frac{3}{5}$	$\frac{7}{10}$	$\frac{4}{5}$	$\frac{9}{10}$	1	0.6	0.7	0.8	0.9	1.0	60%	70%	80%	90%	100%
$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{10}$	$\frac{2}{5}$	$\frac{1}{2}$																											
0.1	0.2	0.3	0.4	0.5																											
10%	20%	30%	40%	50%																											
$\frac{3}{5}$	$\frac{7}{10}$	$\frac{4}{5}$	$\frac{9}{10}$	1																											
0.6	0.7	0.8	0.9	1.0																											
60%	70%	80%	90%	100%																											
I can add and subtract whole numbers and fractions, including when changing a denominator.	<p>the original fractions: $\frac{1}{3} + \frac{1}{2}$</p> <p>with a common denominator: $\frac{2}{6} + \frac{3}{6}$</p> <p>result: $\frac{5}{6}$</p>																														
I can convert between whole or mixed numbers, improper fractions and decimal fractions.	 <p style="text-align: center;">$\frac{5}{3}$</p>  <p style="text-align: right;">$1\frac{2}{3}$</p>																														
Using my knowledge of fractions, decimal fractions and percentages, I can carry out	<p>Example</p> <p>25% of £640</p>																														

calculations with and without a calculator.	$= \frac{1}{4} \text{ of } \pounds 640$ $= \pounds 640 \div 4$ $= \pounds 160$
I can solve problems in which related quantities are increased or decreased proportionally.	<p>Value Added Tax (VAT) = 20% (from 4th January 2010)</p> <p>Example Calculate the total price of a computer which costs $\pounds 650$ excluding VAT</p> <p>20% of $\pounds 650$</p> $= \frac{1}{5} \text{ of } 650$ $= 650 \div 5$ $= 130$ <p style="text-align: right;">Total price = $650 + 130$</p> <p style="text-align: right;">= $\pounds 780$</p>
I can express quantities as a ratio and where appropriate, simplify.	<p>If there are 6 teacher and 60 children in a school, find the ratio of teachers to the total amount of teachers and children.</p> <p style="text-align: center;">Teachers : Teachers and Children</p> <p style="text-align: center;">6 : 66</p> <p style="text-align: center;">1 : 11</p>

Money	
I can identify the best value when comparing products and justify my choice.	
I can budget effectively.	<p>Income: Money received/earned.</p> <p>Expenditure: Money spent.</p>

	Surplus: Money left over. Occurs when income is greater than expenditure.
I can demonstrate knowledge of financial terms.	<p>Debit card: draws money directly from your account when you make a purchase.</p> <p>Credit card: borrows pre-approved funds when you make a purchase. Money is paid back with interest.</p> <p>APR: annual percentage rate</p> <p>pa: per annum</p> <p>Interest rate: the percentage charged by a lender when borrowing money.</p>
I can convert between different currencies.	<p>£ → \$ multiply by the exchange rate.</p> <p>\$ → £ divide by the exchange rate.</p>

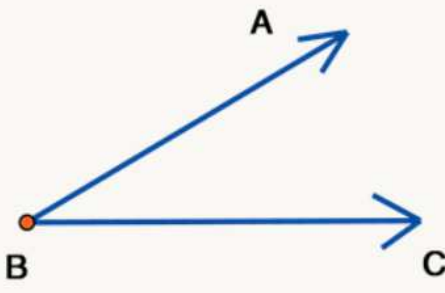
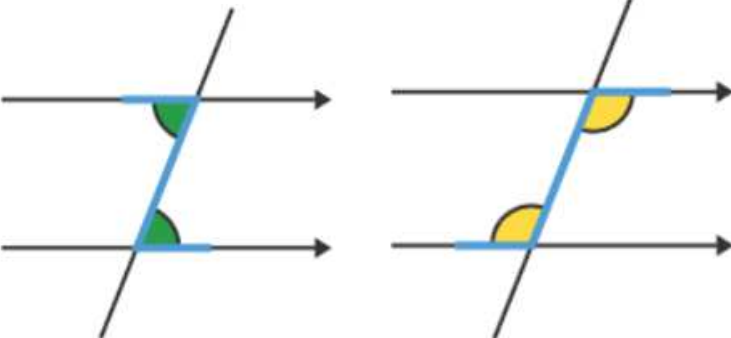
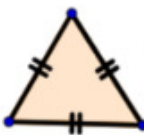
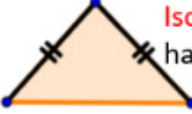
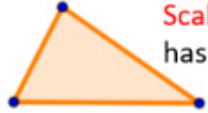
Time					
I can apply knowledge of the relationship between speed, distance and time to find each of the three variables.	<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> </div> <div style="margin-left: 20px;"> $D = S \times T$ $S = D \div T$ $T = D \div S$ </div> </div>				
I can calculate time durations across hours and days.	<table border="1" style="margin-bottom: 10px;"> <tr> <th>Start Time</th> <th>End Time</th> </tr> <tr> <td>2:53 pm</td> <td>4:28 pm</td> </tr> </table> <p>elapsed time: <u>1 hour and 35 minutes</u></p>	Start Time	End Time	2:53 pm	4:28 pm
Start Time	End Time				
2:53 pm	4:28 pm				

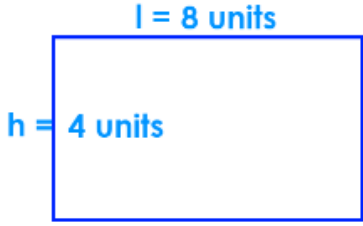
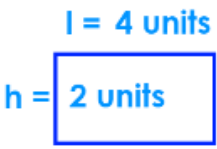
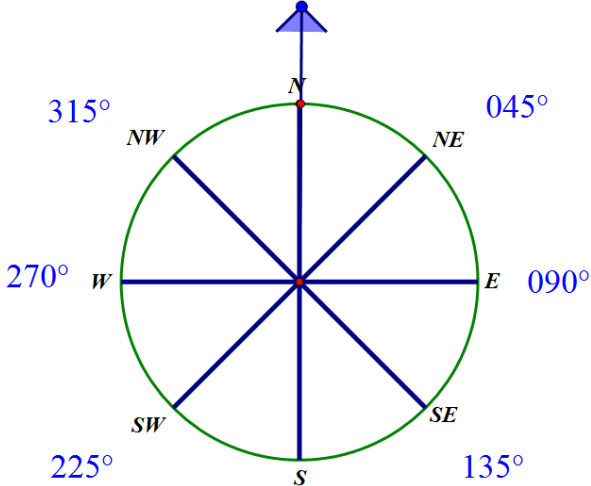
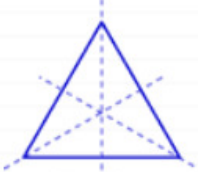
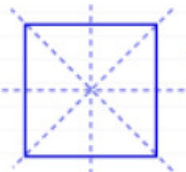
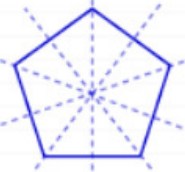
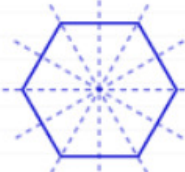
Measurement	
I can identify appropriate units for length, area and volume.	<p>Length: mm, cm, m and km.</p> <p>Area: mm^2, cm^2, m^2</p> <p>Volume: cm^3, ml, L</p>
I can convert between standard units.	
I can calculate the area of 2D shapes.	$A_{rectangle} = L \times B$ $A_{triangle} = \frac{1}{2} \times B \times H$ $A_{circle} = \pi r^2$
I can calculate the area and volume of compound 2D and 3D shapes.	 $Area_A = L \times B = 10 \times 2 = 20cm^2$ $Area_B = L \times B = 4 \times 7 = 28cm^2$ $Total Area = 20 + 28 = 48cm^2$

Patterns and relationships	
I can generate a number sequences from a given rule and vice versa.	<p>Rule: $T = 4n + 6$ Number Sequence: 10, 14, 18, 22...</p> <p>Rule: $T = 2n - 1$ Number Sequence: 1, 3, 5, 7, 9...</p>
I can use algebra to express a sequence.	<p>The cost of hiring a car is £75 plus a charge of £0.05 per mile.</p> <p style="text-align: center;">$C = 75 + 0.05m$</p>

Expressions and equations	
I can collect like terms.	<p style="text-align: center;">$2x + y - x + 3y = x + 4y$</p> <p style="text-align: center;">$a^2 + 2a + 4a^2 = 5a^2 + 2a$</p>
I can solve linear equations.	<p style="text-align: center;">$2x + 3 = 12$</p> <p style="text-align: center;">$2x = 9$</p> <p style="text-align: center;">$x = 4.5$</p>
I can evaluate a simple formula.	<p>Use the formula $P = 2L + 2B$ to evaluate P when $L = 12$ and $B = 7$.</p> <p>$P = 2L + 2B$ Step 1: write formula</p> <p>$P = 2 \times 12 + 2 \times 7$ Step 2: substitute</p> <p>$P = 24 + 14$ Step 3: start to evaluate</p> <p>$P = 38$ Step 4: write answer</p>

Properties of 2D and 3D objects	
I can use mathematical instruments to accurately draw a variety of 2D shapes.	Accurate use of protractor and ruler.

Angle, symmetry and transformation	
I can name angles.	 <p><i>Look Out: when naming an angle using three letters, the vertex must always be the middle letter!</i></p> <p style="text-align: center;">$\angle ABC$</p>
I can identify corresponding and alternate angles.	 <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Alternate Angles</p> </div> <div style="text-align: center;"> <p>Corresponding Angles</p> </div> </div>
I can list properties of triangles and quadrilaterals.	 <p>Equilateral Triangle has three equal sides</p>  <p>Isosceles Triangle has two equal sides</p>  <p>Scalene Triangle has no equal sides</p>

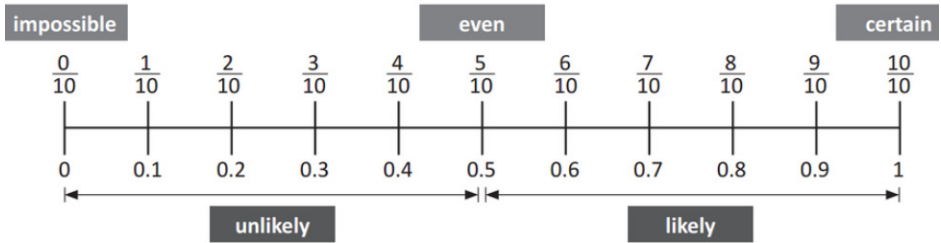
<p>I can enlarge and reduce objects in size, showing understanding of linear scale factor.</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>figure A</p> </div> <div style="text-align: center;">  <p>figure B</p> </div> </div> <p>Figure A and Figure B are similar.</p> $\text{Linear Scale Factor} = \frac{8}{4} = 2$
<p>I can use bearings.</p>	
<p>I can identify all lines of symmetry in 2D shapes.</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>three lines of symmetry</p>  <p>Equilateral Triangle</p> </div> <div style="text-align: center;"> <p>four lines of symmetry</p>  <p>Square</p> </div> <div style="text-align: center;"> <p>five lines of symmetry</p>  <p>Regular Pentagon</p> </div> <div style="text-align: center;"> <p>six lines of symmetry</p>  <p>Regular Hexagon</p> </div> </div>

Data and analysis	
<p>I can describe a method of collecting data.</p>	<p>Survey.</p>
<p>I can describe trends in data.</p>	<p>Example The graph below shows Heather's weight over 14 weeks as she follows an exercise programme.</p>

	<div> <p>The graph shows Heather's weight in kilograms over a 14-week period. The vertical axis (y-axis) is labeled from 60 to 85 in increments of 5. The horizontal axis (x-axis) is labeled 'Week' and ranges from 1 to 14. The data points are connected by a solid black line with circular markers at each point.</p> <table border="1"> <thead> <tr> <th>Week</th> <th>Weight (kg)</th> </tr> </thead> <tbody> <tr><td>1</td><td>85</td></tr> <tr><td>2</td><td>81</td></tr> <tr><td>3</td><td>80</td></tr> <tr><td>4</td><td>79</td></tr> <tr><td>5</td><td>79</td></tr> <tr><td>6</td><td>77</td></tr> <tr><td>7</td><td>76</td></tr> <tr><td>8</td><td>76</td></tr> <tr><td>9</td><td>74</td></tr> <tr><td>10</td><td>74</td></tr> <tr><td>11</td><td>72</td></tr> <tr><td>12</td><td>72</td></tr> <tr><td>13</td><td>71</td></tr> <tr><td>14</td><td>71</td></tr> </tbody> </table> </div> <p>The trend of the graph is that her weight is decreasing.</p>	Week	Weight (kg)	1	85	2	81	3	80	4	79	5	79	6	77	7	76	8	76	9	74	10	74	11	72	12	72	13	71	14	71
Week	Weight (kg)																														
1	85																														
2	81																														
3	80																														
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7	76																														
8	76																														
9	74																														
10	74																														
11	72																														
12	72																														
13	71																														
14	71																														
<p>I can determine if data is robust, vague or misleading.</p>	<p>I consider:</p> <ol style="list-style-type: none"> 1. Validity of the source. 2. Scale used. 3. Sample size. 4. Method of presentation. 5. Appropriateness of how the data was collected. 																														
<p>I can describe bias.</p>	<p>If data collected is described as biased, this means it does not give a fair representation.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Using leading questions. • Having a small sample size. 																														
<p>I can organize and display data appropriately.</p>	<p>Bar graphs are often used to display data. The horizontal axis should show the categories or class intervals, and the vertical axis the frequency. All graphs should have a title, and each axis must be labelled.</p> <p>Example:</p> <div> <p>The bar graph displays the frequency of homework marks for Class 4B. The vertical axis (y-axis) is labeled from 0 to 10 in increments of 1. The horizontal axis (x-axis) is labeled 'Mark' and shows class intervals. The bars are blue.</p> <table border="1"> <thead> <tr> <th>Mark Interval</th> <th>Frequency</th> </tr> </thead> <tbody> <tr><td>16 - 20</td><td>2</td></tr> <tr><td>21 - 25</td><td>7</td></tr> <tr><td>26 - 30</td><td>9</td></tr> <tr><td>31 - 35</td><td>5</td></tr> <tr><td>36 - 40</td><td>3</td></tr> <tr><td>41 - 45</td><td>2</td></tr> <tr><td>46 - 50</td><td>2</td></tr> </tbody> </table> </div>	Mark Interval	Frequency	16 - 20	2	21 - 25	7	26 - 30	9	31 - 35	5	36 - 40	3	41 - 45	2	46 - 50	2														
Mark Interval	Frequency																														
16 - 20	2																														
21 - 25	7																														
26 - 30	9																														
31 - 35	5																														
36 - 40	3																														
41 - 45	2																														
46 - 50	2																														

Ideas of chance and uncertainty

I can use the probability scale of 0 to 1 showing probability as a fraction or decimal fraction.



I can calculate the probability of an event occurring.

Question: What is the probability of throwing a prime number on a 12 sided dice?

Answer: $P(\text{prime}) = \frac{\text{Number of favourable outcomes}}{\text{Number of possible outcomes}}$

$$= \frac{5}{12}$$

I can use a given probability to calculate an expected outcome.

Question: The probability of rain in June is 0.2, so how many days do we expect it to rain?

Answer: $30 \times 0.2 = 6$ days

I can describe mutually exclusive events.

Events are mutually exclusive if both cannot be true.

