














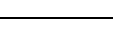
Barrhead High School Mathematics Department

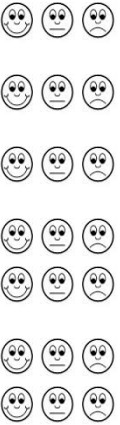


National 4 Mathematics









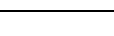

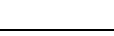




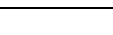


Learning Intentions & Success Criteria: Assessing My Progress












Expressions and Formulae			
Topic	Learning Intention	Success Criteria	I understand this...
Algebra	<ul style="list-style-type: none"> • Pupils will be able to simplify algebraic expressions by collecting like terms. • Pupils will be able to simplify algebraic expressions by expanding brackets. • Pupils will be able to factorise an algebraic expression. • Pupils will be able to evaluate an expression • Pupils will be able to solve a linear equation or inequality using algebraic manipulation. 	<ul style="list-style-type: none"> • I can gather like terms. • I can gather like terms including where more than one variable is involved. • I can expand brackets in an expression with a common factor to produce a sum of terms. • I can recognise the highest common factor of two or more expressions. • I can factorise a sum of terms with a common factor. • I can evaluate expressions and formulae with one or more variables. • I can extend straightforward number or diagrammatic patterns. • I can determine the formula describing straightforward number or diagrammatic patterns. 	
Shape	<ul style="list-style-type: none"> • Pupils will be able to calculate the gradient of a straight line. 	<ul style="list-style-type: none"> • I can calculate the gradient of a straight line from horizontal and vertical distances. 	










	<ul style="list-style-type: none"> • Pupils will be able to calculate the area and perimeter of given shapes. • Pupils will be able to identify a range of 2D shapes. • Pupils will be able to find the volume of a simple 3D solid. • Pupils will be able to find the surface area of a simple 3D solid. • Pupils will be able identify and create patterns using symmetry. 	<ul style="list-style-type: none"> • I can calculate the circumference and area of a circle given the diameter or radius. • I can calculate the area of a parallelogram, kite or trapezium. • I can explain the terms face, vertex and edge of a 3-D shape. • I can construct the net of a prism. • I can calculate the surface area of a prism. • I can calculate the volume of a prism given the area of the base and the height. • I can recognise the order of rotational symmetry of straightforward shapes. • I can use appropriate mathematical language to discuss the rotational properties of shapes, pictures and patterns. • I can use symmetry to complete or create designs. 	           
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<p style="text-align: center;">Statistics</p>	<ul style="list-style-type: none">• Pupils will be able to work with a variety of statistical graphs in context.• Pupils will be able to interpret a range of graphs and apply these to the given context.• Pupils will be able to apply probability to real life situations.	<ul style="list-style-type: none">• I can construct a frequency table with class intervals as appropriate from raw data.• I can construct a pie chart, bar graph and line graph from raw data.• I can determine the mean, median, mode and range of a data set.• I can interpret calculated statistics.• I can calculate the probability of an event and comment on comparisons between probabilities.• I can interpret situations where mathematics can be used and identify valid strategies to apply.• I can explain solutions and/or relate them to the context of the problem.	
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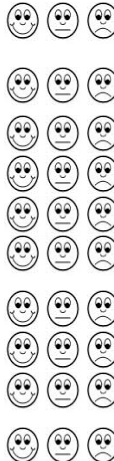

Relationships


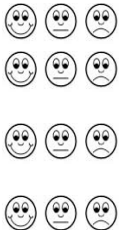
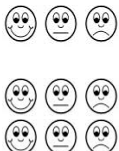
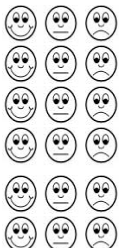
Topic	Learning Intention	Success Criteria	I understand this...
Straight Line	<ul style="list-style-type: none"> • Pupils will be able to sketch a straight line graph using a table of values. • Pupils will be able to find the gradient and y intercept of a straight line graph and hence find the equation. 	<ul style="list-style-type: none"> • I can construct a table of values from the equation of a straight line. • I can draw the graph of a linear equation given a table of values. • I can recognise the gradient and y intercept of a line from its graph. • I can write down the equation of a straight line given the gradient and y intercept. • I can calculate the gradient of a straight line given two points on the line. • I can find the equation of a straight line given its gradient and a point on the line. • I can find the solution to a pair of non-parallel lines by plotting them on a Cartesian diagram and identifying the point of intersection. 	        
Algebraic Expressions	<ul style="list-style-type: none"> • Pupils will be able to rearrange a formula. 	<ul style="list-style-type: none"> • I can change the subject of a formula 	  
Pythagoras	<ul style="list-style-type: none"> • Pupils will be able to use Pythagoras' Theorem to find the length of a missing side in a right angled triangle. 	<ul style="list-style-type: none"> • I can quote Pythagoras' theorem and can identify the hypotenuse of a right angled triangle. • I can use Pythagoras' theorem to calculate the hypotenuse of a right angled triangle. • I can use Pythagoras' theorem to calculate the shorter sides of a right angled triangle. 	     


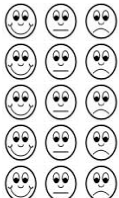
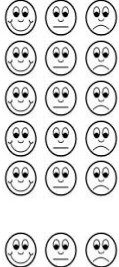
<p>Scale Factor</p>	<ul style="list-style-type: none"> Pupils will be able to use a scale factor to enlarge or reduce a length. 	<ul style="list-style-type: none"> I can use a fractional scale to reduce or enlarge a shape. 	
<p>Angles</p>	<ul style="list-style-type: none"> Pupils will be able to identify types of triangle. Pupils will be able to use triangle properties to calculate missing angles. Pupils will know the properties of parallel lines and associated angles. 	<ul style="list-style-type: none"> I can find missing angles in a triangle by using the fact that the sum of angles in a triangle is 180°. I can find missing angles by using the fact that corresponding angles are equal. I can find missing angles by using the fact that alternate angles are equal. I can find missing angles by using the fact that vertically opposite angles are equal. I can find missing angles by using the fact that complementary angles add up to 90°. I can find missing angles by using the fact that supplementary angles add up to 180°. 	     
<p>Trigonometry</p>	<ul style="list-style-type: none"> Pupils will be able to find the sine, cosine or tangent of any angle. Pupils will be able to find the length of a missing side in any right angled triangle. Pupils will be able to calculate a missing angle in any right angled triangle. 	<ul style="list-style-type: none"> I can correctly identify the opposite and adjacent sides corresponding to an angle in a right angled triangle. I can identify whether to use the sine, cosine or tangent function to calculate a missing side or angle in a right angled triangle. I can substitute into the appropriate trigonometric function to calculate a missing side in a right angled triangle. I can process the appropriate trigonometric function to calculate a missing side in a right angled triangle. 	   

	<ul style="list-style-type: none"> • Pupils will be able to apply their knowledge of triangles and trigonometry to solve problems. 	<ul style="list-style-type: none"> • I can substitute into the appropriate trigonometric function to calculate a missing angle in a right angled triangle. • I can process the appropriate trigonometric function to calculate a missing angle in a right angled triangle. • I can solve trigonometry problems in context. 	  
<p style="text-align: center;">Statistics</p>	<ul style="list-style-type: none"> • Pupils will be able to interpret a scatter graph. • Pupils will be able to identify correlation. • Pupils will be able to draw a best fitting line. • Pupils will be able to use their best fitting straight line to answer questions in context. 	<ul style="list-style-type: none"> • I can construct a scattergraph by plotting pairs of values. • I can draw an appropriate line of best fit on a scatter graph. • I can use a scattergraph and line of best fit to estimate missing values. • I can use my answers to make conclusions and explain those decisions. • I can use the context of a problem to make reasoned decisions. 	     

Numeracy

Topic	Learning Intention	Success Criteria	I understand this...
Whole Numbers	<ul style="list-style-type: none"> Pupils will be able to accurately work with whole numbers in a variety of contexts. Pupils will be able to carry out whole number calculations in the correct order. 	<ul style="list-style-type: none"> I can read and write whole numbers expressed in figure and words I can order whole numbers and recognise place value I can add and subtract accurately I can multiply by a number less than 10 I can multiply whole numbers by 10, 100, 1000... I can multiply whole numbers by multiples of 10, 100, 1000... I can divide by a number less than 10 I can divide whole numbers by 10, 100, 100 ... I can carry out long multiplication I can carry out a specific order of operations using BODMAS 	
Negative Numbers	<ul style="list-style-type: none"> Pupils will be able to understand the use and importance of negative numbers. Pupils will be able to accurately work with negative numbers in a variety of contexts. 	<ul style="list-style-type: none"> I understand that a number line can be extended to include numbers less than zero I understand that these numbers are called integers I understand how to write a negative number I can add and subtract negative numbers I can multiply and divide negative numbers 	

Decimals	<ul style="list-style-type: none"> Pupils will be able to accurately work with decimal numbers in a variety of contexts. Pupils will be able to accurately work with decimal numbers when using money. 	<ul style="list-style-type: none"> I can place decimals in order by considering place value I can add and subtract decimals I can multiply and divide decimals by a whole number I can use decimal notation for use in money I can change decimals to fractions 	
Rounding	<ul style="list-style-type: none"> Pupils will be able to accurately round numbers to a suitable degree of accuracy. 	<ul style="list-style-type: none"> I can round a number to an approximate number I can round a number to a given number of decimal places I can round a number to a given number of significant figures I can choose a suitable degree of accuracy for measurements e.g. $\pm 2\text{cm}$ 	
Fractions	<ul style="list-style-type: none"> Pupils will be able to accurately work with fractions in a variety of contexts. 	<ul style="list-style-type: none"> I understand what is meant by the words numerator and denominator I can calculate a fraction of a quantity I understand how to write a fraction as a decimal 	
Percentages	<ul style="list-style-type: none"> Pupils will be able to accurately work with percentages in a variety of contexts. 	<ul style="list-style-type: none"> I understand how to write a percentage I can change a percentage to a decimal or a fraction I can change a decimal or a fraction to a percentage I understand that percentages can be used to compare fractions I can calculate a percentage of a quantity I can calculate a percentage increase or decrease 	

<p>Speed Distance Time</p>	<ul style="list-style-type: none"> • Pupils will be able to use distance, speed & time. 	<ul style="list-style-type: none"> • I can convert between 12 hour and 24 hour time • I understand how to use a timetable • I can calculate speed, distance and time 	
<p>Ratio and Proportion</p>	<ul style="list-style-type: none"> • Pupils will be able to accurately work with ratio and proportion in a variety of contexts. 	<ul style="list-style-type: none"> • I understand how to read a ratio • I can simplify a ratio • I can find and equivalent ratio • I understand direct proportion • I can calculate unknown quantities using direct proportion 	
<p>Measurement</p>	<ul style="list-style-type: none"> • Pupils will be able to accurately work with measurement in a variety of contexts. • Pupils will be able to understand the importance of measurement and its uses in the working world. • Pupils will be able to calculate the perimeter and area of given shapes. • Pupils will be able to find the volume of a simple 3D solid. 	<ul style="list-style-type: none"> • I can convert between common units within a family • I can select an appropriate unit of measurement • I can read scales accurately • I can calculate the perimeter of a shape • I can calculate the area of a square/rectangle /triangle/ composite shape • I can calculate the volume of a cube /cuboid 	

Statistics and Probability

- Pupils will be able to work with a variety of statistical graphs in context.
- Pupils will be able to interpret a range of graphs and apply these to the given context.
- Pupils will be able to interpret a scatter graph.
- Pupils will be able to identify correlation.
- Pupils will be able to draw a best fitting line and determine its equation.
- Pupils will be able to apply probability to real life situations.

- I can interpret graphs involving real life situations
- I can extract data from a bar graph and use this to make decisions
- I can find the mean, median, mode and range of a data set
- I can construct and interpret a stem and leaf diagram
- I can construct and interpret a line graph
- I can construct and interpret a bar graph
- I can construct and interpret a pie chart
- I can construct and interpret a scatter graph
- I can interpret data from a variety of tables
- I can calculate probability
- I can use probability to help make decisions

