Lode Heath School

Mathematics Department

Year 9 Higher
Summer Term

Assignment Title	Unit 5: Angles and trigonometry	Date set	Summer 1

Summary of Unit 5	Key Words
Find missing angles in triangles, quadrilaterals and polygons. Use Pythagoras' Theorem and trigonometry to find missing sides and angles in right angled triangles.	Quadrilateral, angle, polygon, interior, exterior, proof, tessellation, symmetry, parallel, corresponding, alternate, co-interior, vertices, edge, face, sides, Pythagoras' Theorem, sine, cosine, tan, trigonometry, opposite, hypotenuse, adjacent, ratio, elevation, depression, segment, length.

Check in: What do you know already?

1) What do angles around a point add up to?

2) What do angles on a straight line add up to?

3) What do you know about vertically opposite angles?

4) Can you name and describe the key features of all the types of:

   a) An isosceles triangle b) A kite c) Polygons

LEARNING JOURNEY

Level	Task Description
3-4	**5.1 Angle properties of triangles and quadrilaterals** Derive and use the sum of angles in a triangle and in a quadrilateral. Derive and use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles.
4-5	**5.2 Interior angles of a polygon** Calculate the sum of the interior angles of a polygon. Use the interior angles of polygons to solve problems.
4-5	**5.3 Exterior angles of a polygon** Know the sum of the exterior angles of a polygon. Use the angles of polygons to solve problems.
4-6	**5.4 Pythagoras' theorem 1** Calculate the length of the hypotenuse in a right-angled triangle. Solve problems using Pythagoras' theorem. Calculate the length of a shorter side in a right-angled triangle. Solve problems using Pythagoras' theorem.
5-7	**5.6 Trigonometry 1** Use trigonometric ratios to find lengths in a right-angled triangle. Use trigonometric ratios to solve problems.
5-7	**5.7 Trigonometry 2** Use trigonometric ratios to calculate an angle in a right-angled triangle. Find angles of elevation and angles of depression. Use trigonometric ratios to solve problems. Know the exact values of the sine, cosine and tangent of some angles.

Assignment Title	Unit 6: Graphs	Date set	Summer 1

Summary of Unit 6	Key Words
Use y = mx + c to find the gradient and y-intercept and plot them. Find the equation of a line from a graph or coordinates. Draw and use other types of graphs.	Coordinate, axes, 3D, Pythagoras, graph, speed, distance, time, velocity, quadratic, solution, root, function, linear, circle, cubic, approximate, gradient, perpendicular, parallel, equation.

Prior Knowledge:

When $x = 8$, what is the value of $5x$?

Tick (✓) the correct box below.

☐ 5 ☐ 13 ☐ 40 ☐ 58 ☐ None of these

When $x = 8$, what is the value of $3x - x$?

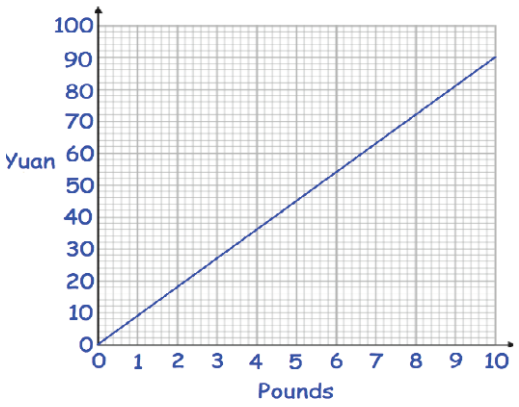
Tick (✓) the correct box below.

☐ 0 ☐ 3 ☐ 16 ☐ 30 ☐ None of these

When $x = 8$, what is the value of x^2?

Tick (✓) the correct box below.

☐ 8 ☐ 10 ☐ 16 ☐ 64 ☐ None of these



Using the graph, calculate:

a) £5 = ... yuan c) £70 = ... yuan

b) 80 yuan = £.....

LEARNING JOURNEY

Level	Task Description
4-7	**6.1 Linear graphs** *(GCSE Statistics)* Find the gradient and y-intercept from a linear equation. Rearrange an equation into the form y = mx + c. Plot graphs with equations ax + by = c.
5-6	**6.2 More linear graphs** *(GCSE Statistics)* Sketch graphs using the gradient and intercepts. Find the equation of a line, given its gradient and one point on the line. Find the gradient of a line through two points.
4-5	**6.3 Graphing rates of change** Draw and interpret distance–time graphs. Calculate average speed from a distance–time graph. Find acceleration and distance from velocity–time graphs.
4-5	**6.4 Real-life graphs** Draw and interpret real-life linear graphs. Recognise direct proportion. Draw and use a line of best fit.
4-5	**6.5 Line segments** Find the coordinates of the midpoint of a line segment. Find the gradient and length of a line segment. Find the equations of lines parallel or perpendicular to a given line.
5-6	**6.6 Quadratic graphs** Draw quadratic graphs. Solve quadratic equations using graphs. Identify the line of symmetry of a quadratic graph. Interpret quadratic graphs relating to real-life situations.
6-7	**6.7 Cubic and reciprocal graphs** Draw graphs of cubic functions. Solve cubic equations using graphs. Draw graphs of reciprocal functions. Recognise a graph from its shape.
6-8	**6.8 More graphs** Interpret linear and non-linear real-life graphs. Draw the graph of a circle.

Assignment Title	Unit 7: Transformations and	Date Set	Summer 2

	constructions		

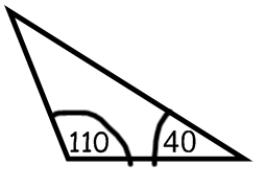
Summary of Unit 7	Key Words
To apply and describe transformations including translations, reflections, rotations and enlargements. Perform constructions using a compass and protractor. To understand and use bearings to solve problems and to solve problems using loci.	points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, reflection, rotation symmetries, faces, surfaces, edges, vertices, cubes, cuboids, prisms, cylinders, pyramids, cones, spheres rotation, reflection, translation, enlargement

Check in: What do you know already?

1) Complete a) 1m = ……cm b) 1km = ……m c) 1km = ……cm

2) a) How many cm in 4m? b) How many m in 6.2km?

3) How would you draw this shape accurately?



Level	LEARNING JOURNEY
4-5	**7.1 3D solids** Draw plans and elevations of 3D solids.
4	**7.2 Reflection and rotation** Reflect a 2D shape in a mirror line. Rotate a 2D shape about a centre of rotation. Describe reflections and rotations.
4-6	**7.3 Enlargement** Enlarge shapes by fractional and negative scale factors about a centre of enlargement.
4	**7.4 Transformations and combinations of transformations** Translate a shape using a vector. Carry out and describe combinations of transformations.
4-5	**7.5 Bearings and scale drawings** Draw and use scales on maps and scale drawings. Solve problems involving bearings.
4-5	**7.6 Constructions 1** Construct triangles using a ruler and compasses. Construct the perpendicular bisector of a line. Construct the shortest distance from a point to a line using a ruler and compasses.
4-5	**7.7 Constructions 2** Bisect an angle using a ruler and compasses. Construct angles using a ruler and compasses. Construct shapes made from triangles using a ruler and compasses.
5-6	**7.8 Loci** Draw a locus. Use loci to solve problems.