Year Overview

Year 8

Term 3 Year 08 [Maths] | Topic 1 | [Angles]

Topic Overview:
This unit develops students' understanding of angle facts, including angles on a line, around a point, and key relationships in parallel lines. Students use these to calculate missing angles and justify their reasoning.
Prior & Subsequent Knowledge:
During KS2 and Year 7, students developed an understanding of basic angle facts, practised measuring angles, and solved simple missing-angle problems. This term, they will build on this knowledge by applying corresponding, alternate, co-interior and vertically opposite angles in more complex diagrams. This topic lays the foundations for angle reasoning in polygons, geometric proofs, circle theorems, similarity, and trigonometry in KS4.

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 01	Angles	G3 understand and use the relationship between parallel lines and alternate and corresponding angles	Know that: • Two parallel straight lines will never intersect • Two lines that are not parallel will intersect exactly once • The intersection between a transversal and two parallel lines creates equivalent angles • Alternate angles are equal • Corresponding angles are equal • Allied/co-interior angles sum to 180° • Notation is used to show when two lines are parallel	• Review how to find angles on a straight line and around a point • Justify reasoning when finding a missing angle • Identify vertically opposite angles and explain why they are equal	**Check Point 01:** What is the name for an angle that is greater than 0° but less than 90°? **Check Point 02:** What is the name for an angle that is greater than 90° but less than 180°? **Check Out Questions (05 questions):** 1. What is the name for an angle that is greater than 180° but less than 360°? 2. How many degrees are in a full turn? 3. Two angles on a straight line measure x and 125°. What is the value of x? 4. Three angles around a point measure 90°, 70°, and y. What is the value of y? 5. If two angles are vertically opposite and one measures 50°, what is the measure of the other?	**Activity 01:** Three angles on a straight line are given as algebraic expressions: (2x+10)◦, (x+5)◦, and x◦. Find the value of x and the size of each angle. **Check Point 01** Set up the equation you would use to solve the Problem **Activity 02:** Two supplementary angles are given as (5k−20)◦ and (2k+10)◦. Find the value of k and the size of each angle. **Check Point 02:** Set up the equation you would use to solve the Problem	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Angle Vertex Arm Acute angle Obtuse angle Right angle Straight angle Reflex angle Full turn Complementary angles Supplementary angles Vertically opposite angles Angles on a straight line Angles around a point Angles in a triangle Angles in a quadrilateral Parallel lines	**Art and Design:** Understanding perspective, proportion, and symmetry in creating drawings and patterns. Artists and architects use angles to create depth and balance. **Science (Physics):** The laws of reflection and refraction in optics are based on angles. The study of forces often involves vectors and their angles. **Design and Technology (DT) and Engineering:** Angles are fundamental to construction, carpentry, and architecture. Building a stable structure,

Year Overview

Year 8

							Transversal Corresponding angles Alternate angles Interior angles Exterior angles Angle bisector Perpendicular Degrees (◦) Protractor Compass Ruler **Literacy:** **Angle Pictionary:** One student draws a diagram of a key term (e.g., an acute angle, a pair of vertically opposite angles) without speaking. **Oracy: Think - Pair - Share:** Their partner must correctly identify the term and explain its properties. They then swap roles.	designing a functional hinge, or creating a gear system all rely on precise angle measurement. **Computer Science:** Computer graphics and animation use angles to rotate objects and create 3D effects. Robotics relies on angles to control the movement of arms and joints. **Geography:** Navigation, using bearings and compass directions, is entirely based on angles. Cartographers use angles to create accurate maps. **Physical Education (P.E.):** The trajectory of a thrown ball or the angle of a golf swing determines its flight path. Biomechanics uses angles to analyze joint movement and athletic performance.

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Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 02	Angles	G3	Know that: • Two parallel straight lines will never intersect • Two lines that are not parallel will intersect exactly once • The intersection between a transversal and two parallel lines creates equivalent angles • Alternate angles are equal • Corresponding angles are equal • Allied/co-interior angles sum to 180° • Notation is used to show when two lines are parallel	• Identify if two lines are parallel • Identify alternate angles and explain why they are equal	**Check Point 01:** What is the sum of two complementary angles? **Check Point 02:** What is the sum of two supplementary angles? **Check Out Questions (05 questions):** 1. What is the complement of a 30° angle? 2. What is the supplement of a 110° angle? 3. If two parallel lines are cut by a transversal, what is the relationship between alternate interior angles? 4. If two parallel lines are cut by a transversal, what is the relationship between corresponding angles? 5. If two parallel lines are cut by a transversal, what is the relationship between consecutive interior angles?	**Activity 01:** **Draw and Label:** Draw a pair of parallel lines cut by a transversal. Label a pair of alternate interior angles 'A' and 'B'. **Prove it:** Using your knowledge of corresponding angles and angles on a straight line, construct a simple, logical proof to show that angle A must be equal to angle B. You can use another angle, say 'C', to help with your proof. **Check Point 01** Explain the role of the corresponding angle in your proof. **Activity 02:** Look at the following diagram (It contains multiple triangles and parallel lines). Find the value of every missing angle labeled in the diagram. **Check Point 02:** For each angle you find, state the reason (e.g., "Angles on a straight line," "Angles in a triangle," "Alternate angles").	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Angle Vertex Arm Acute angle Obtuse angle Right angle Straight angle Reflex angle Full turn Complementary angles Supplementary angles Vertically opposite angles Angles on a straight line Angles around a point Angles in a triangle Angles in a quadrilateral Parallel lines Transversal Corresponding angles Alternate angles Interior angles Exterior angles Angle bisector Perpendicular Degrees (◦) Protractor Compass Ruler	**Art and Design:** Understanding perspective, proportion, and symmetry in creating drawings and patterns. Artists and architects use angles to create depth and balance. **Science (Physics):** The laws of reflection and refraction in optics are based on angles. The study of forces often involves vectors and their angles. **Design and Technology (DT) and Engineering:** Angles are fundamental to construction, carpentry, and architecture. Building a stable structure, designing a functional hinge, or creating a gear system all rely on precise angle measurement. **Computer Science:** Computer graphics and animation use angles to rotate objects and create 3D effects. Robotics relies on angles to control

Lift Bexleyheath

Year Overview

Year 8

							Literacy: **Definition Swap:** Each student writes a definition for three different key terms on separate slips of paper. They shuffle their slips and exchange them with a partner. They must read their partner's definitions and guess which term is being defined. **Oracy: Think - Pair - Share:** **The Angle Walk:** In pairs, students walk around the classroom or school building. One student points out an angle (e.g., the corner of a window, the hinge of a door) and correctly names it (e.g., "That's a right angle"). Their partner must then find an example of a different type of angle and do the same.	the movement of arms and joints. **Geography:** Navigation, using bearings and compass directions, is entirely based on angles. Cartographers use angles to create accurate maps. **Physical Education (P.E.):** The trajectory of a thrown ball or the angle of a golf swing determines its flight path. Biomechanics uses angles to analyze joint movement and athletic performance.

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 03	Angles	G3	Know that: • Two parallel straight lines will never intersect • Two lines that are not parallel will intersect exactly once • The intersection between a transversal and two parallel lines creates equivalent angles • Alternate angles are equal • Corresponding angles are equal • Allied/co-interior angles sum to 180° • Notation is used to show when two lines are parallel	• Identify corresponding angles and explain why they are equal	**Check Point 01:** If two parallel lines are cut by a transversal, what is the relationship between alternate interior angles? **Check Point 02:** If two parallel lines are cut by a transversal, what is the relationship between corresponding angles? **Check Out Questions (05 questions):** 1. A pair of alternate angles measure 55° and f. What is the value of f? 2. A pair of corresponding angles measure g and 115°. What is the value of g? 3. A pair of consecutive interior angles are h and 130°. What is the value of h? 4. A pair of supplementary angles are in the ratio 2:7. What are the measures of the two angles? 5. An angle is equal to its own complement. What is its measure?	**Activity 01:** Draw a symmetrical pattern or a symmetrical design using only a ruler, a protractor, and a compass. **Check Point 01** Check that your design has at least three different types of angles (e.g., acute, obtuse, right) and at least one pair of parallel lines. **Activity 02:** Label three different angles in your drawing and state their measures and types. Also, label the pair of parallel lines you used. **Check Point 02:** Show your drawing and point out corresponding angles and alternate angles.	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Angle Vertex Arm Acute angle Obtuse angle Right angle Straight angle Reflex angle Full turn Complementary angles Supplementary angles Vertically opposite angles Angles on a straight line Angles around a point Angles in a triangle Angles in a quadrilateral Parallel lines Transversal Corresponding angles Alternate angles Interior angles Exterior angles Angle bisector Perpendicular Degrees (◦) Protractor Compass Ruler	**Art and Design:** Understanding perspective, proportion, and symmetry in creating drawings and patterns. Artists and architects use angles to create depth and balance. **Science (Physics):** The laws of reflection and refraction in optics are based on angles. The study of forces often involves vectors and their angles. **Design and Technology (DT) and Engineering:** Angles are fundamental to construction, carpentry, and architecture. Building a stable structure, designing a functional hinge, or creating a gear system all rely on precise angle measurement. **Computer Science:** Computer graphics and animation use angles to rotate objects and create 3D effects. Robotics relies on angles to control

Year Overview

Year 8

							Literacy: Parallel Lines Partner: Each student draws a pair of parallel lines with a transversal. **Oracy: Think - Pair - Share:** They take turns pointing at two angles and describing their relationship using the correct terminology (e.g., "This angle and this angle are corresponding angles, so they are equal").	the movement of arms and joints. **Geography:** Navigation, using bearings and compass directions, is entirely based on angles. Cartographers use angles to create accurate maps. **Physical Education (P.E.):** The trajectory of a thrown ball or the angle of a golf swing determines its flight path. Biomechanics uses angles to analyze joint movement and athletic performance.

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 04	Angles	understand and use the relationship between parallel lines and alternate and corresponding angles	Know that: • Two parallel straight lines will never intersect • Two lines that are not parallel will intersect exactly once • The intersection between a transversal and two parallel lines creates equivalent angles • Alternate angles are equal • Corresponding angles are equal • Allied/co-interior angles sum to 180° • Notation is used to show when two lines are parallel	• Identify allied/co-interior angles and explain why they sum to 180	**Check Point 01:** Where are co-interior angles located? **Check Point 02:** What is the relationship between co-interior angles? **Check Out Questions (05 questions):** 1. If two co-interior angles are x and 115°, what is the value of x? 2. A pair of parallel lines are crossed by a transversal. One of the co-interior angles is 50°. What is the size of the other? 3. If two parallel lines are cut by a transversal, what is the name for the angles that are equal and in a 'Z' shape? 4. The two co-interior angles are 2x and x. What is the value of x? 5. Two angles are co-interior. One is three times the size of the other. What is the size of the smaller angle?	**Activity 01:** Draw a pair of parallel lines with a transversal. Label a pair of **co-interior angles** 'A' and 'B'. On your diagram, label the angle corresponding to angle 'B' with the letter 'C'. Have you written a step-by-step proof that correctly uses the relationship between angles A and C (angles on a straight line) and B and C (corresponding angles) to show that A + B = 180^0? **Check Point 01** Have you clearly explained how the corresponding angle (C) is a crucial part of your proof? **Activity 02:** Imagine you are an architect designing the support beams for a bridge. Draw a sketch of your bridge design showing a pair of parallel support beams (lines) and a diagonal connecting beam (transversal). Label a pair of co-interior angles on your design. **Check Point 02:**	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Angle Vertex Arm Acute angle Obtuse angle Right angle Straight angle Reflex angle Full turn Complementary angles Supplementary angles Vertically opposite angles Angles on a straight line Angles around a point Angles in a triangle Angles in a quadrilateral Parallel lines Transversal Corresponding angles Alternate angles Interior angles Exterior angles Angle bisector Perpendicular Degrees (◦) Protractor Compass Ruler **Literacy:** **The "Vocabulary Crossword"** **Objective:** Students will reinforce their understanding of key terms related to parallel lines and angles. **Instructions:** 1. **Crossword Creation:** Provide a	**Art and Design:** Understanding perspective, proportion, and symmetry in creating drawings and patterns. Artists and architects use angles to create depth and balance. **Science (Physics):** The laws of reflection and refraction in optics are based on angles. The study of forces often involves vectors and their angles. **Design and Technology (DT) and Engineering:** Angles are

Year Overview

Year 8

					If one of the co-interior angles on your design measures 65◦, what is the measure of the other angle? Show your calculation.		simple crossword puzzle using key terms like **transversal**, **co-interior**, **parallel**, **supplementary**, and **vertex**. 2. **Clues:** The clues should be simple definitions or descriptions of the terms. ○ **Across:** "A line that cuts across a set of parallel lines." (Answer: transversal) ○ **Down:** "Angles that are on the same side of a transversal and between two parallel lines." (Answer: co-interior) 3. **Silent Completion:** Students work individually to complete the crossword, which encourages quiet, focused recall. **Oracy: Think - Pair - Share:** **The "Angles on a Straight Line" Explanation** **Objective:** Students will verbally prove that co-interior angles are supplementary. **Instructions:** 1. **Diagram:** Provide the same diagram of two parallel lines and a transversal. 2. **Setup:** Label one co-interior angle as 'A' and the other as 'B'. Label the angle that is **corresponding** to B as 'C'. 3. **Verbal Proof:** ○ **Step 1:** In pairs, one student identifies the relationship between angle 'A' and angle 'C'. They should state, "Angle A and	fundamental to construction, carpentry, and architecture. Building a stable structure, designing a functional hinge, or creating a gear system all rely on precise angle measurement. **Computer Science:** Computer graphics and animation use angles to rotate objects and create 3D effects. Robotics relies on angles to control the movement of arms and joints. **Geography:** Navigation, using bearings and compass

Year Overview

Year 8

							Angle C are **angles on a straight line**, so they add up to **180 degrees**." ○ **Step 2:** The partner then identifies the relationship between angle 'B' and angle 'C'. They should state, "Angle B and Angle C are **corresponding angles**, so they are **equal**." ○ **Step 3:** Together, they combine these two facts to form the conclusion: "Since Angle C is equal to Angle B, we can substitute B for C in the first statement. Therefore, Angle A and Angle B also add up to 180 degrees. This is why **co-interior angles are supplementary**." 4. **Switch Roles:** Students swap roles to practice both parts of the explanation.	directions, is entirely based on angles. Cartographers use angles to create accurate maps. **Physical Education (P.E.):** The trajectory of a thrown ball or the angle of a golf swing determines its flight path. Biomechanics uses angles to analyze joint movement and athletic performance.

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 05	Angles	G3	Know that: • Two parallel straight lines will never intersect • Two lines that are not parallel will intersect exactly once • The intersection between a transversal and two parallel lines creates equivalent angles • Alternate angles are equal • Corresponding angles are equal • Allied/co-interior angles sum to 180° • Notation is used to show when two lines are parallel	• Show using notation if two straight lines are parallel • Use correct notation to label an angle eg. ABC • Justify reasoning when finding a missing angle	**Check Point 01:** A straight line is split into three angles: 2x, 3x, and 4x. What is the value of x? **Check Point 02:** Four angles around a point are z, 2z, 3z, and 4z. What is the value of z? **Check Out Questions (05 questions):** 1. The angles in a triangle are b, b, and 40°. What is the value of b? 2. The angles in an isosceles triangle are c, c, and 80°. What is the value of c? 3. The angles in a right-angled triangle are 90°, d, and d+10°. What is the value of d? 4. What is the sum of the interior angles of a quadrilateral? 5. The angles in a quadrilateral are 100°, 80°, 70°, and e. What is the value of e?	**Activity 01:** **Diagram:** Draw a cuboid and label its vertices (e.g., A, B, C, D, E, F, G, H). **Check Point 01** **Identification:** Name three different right angles within the cuboid that exist in different planes. For example, an angle on the front face, one on the top face, and one in an interior plane. **Activity 02:** **Angle Calculation:** Imagine a line is drawn from vertex A to vertex G (a space diagonal) and another from A to F (a face diagonal). What kind of triangle is formed by the vertices A, E, and G? Can you work out the size of the angle ∠AGE? **Check Point 02:** Draw a cuboid and name two angles on a single face	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Angle Vertex Arm Acute angle Obtuse angle Right angle Straight angle Reflex angle Full turn Complementary angles Supplementary angles Vertically opposite angles Angles on a straight line Angles around a point Angles in a triangle Angles in a quadrilateral Parallel lines Transversal Corresponding angles Alternate angles Interior angles Exterior angles Angle bisector Perpendicular Degrees (◦) Protractor Compass Ruler **Literacy:** **The "Parallel Lines Description"** **Objective:** Students will write a clear explanation of how to show two lines	**Art and Design:** Understanding perspective, proportion, and symmetry in creating drawings and patterns. Artists and architects use angles to create depth and balance. **Science (Physics):** The laws of reflection and refraction in optics are based on angles. The study of forces often involves vectors and their angles. **Design and Technology (DT) and Engineering:** Angles are fundamental to construction, carpentry, and architecture. Building a stable structure, designing a functional hinge, or creating a gear system all

Year Overview

Year 8

							are parallel using notation. **Instructions:** 1. **Observe:** Provide a diagram showing two parallel lines, A and B, cut by a transversal. The parallel lines should have the small arrows on them. . 2. **Write:** Students write a short paragraph answering these questions: ○ What do the arrows on lines A and B mean? ○ How do these arrows show that the lines are parallel? ○ Why is this notation important? (Think about why we can't just assume lines are parallel from a drawing). 3. **Peer Review:** Students swap their paragraphs with a partner. They read and check for clarity, correct use of the term **parallel**, and whether all	rely on precise angle measurement. **Computer Science:** Computer graphics and animation use angles to rotate objects and create 3D effects. Robotics relies on angles to control the movement of arms and joints. **Geography:** Navigation, using bearings and compass directions, is entirely based on angles. Cartographers use angles to create accurate maps. **Physical Education (P.E.):** The trajectory of a thrown ball or the angle of a golf swing determines its flight path. Biomechanics uses angles to analyze joint movement and athletic performance.

Year Overview

Year 8

							questions were answered. **Oracy: Think - Pair - Share:** **The "Notation Translator"** **Objective:** Students will translate a written description of parallel lines and angles into a verbal explanation. **Instructions:** 1. **Cards:** Prepare small cards with different scenarios. ○ **Card A:** "Draw two lines, AB and CD. Mark them as parallel. Add a transversal, EF, cutting both lines. Shade the corresponding angle to ∠AEF." ○ **Card B:** "Draw a triangle XYZ. Identify the angle ∠XYZ." 2. **Translate:** In pairs, one student reads a card aloud. The other student must listen carefully and then verbally describe what the card asks them to draw or do, using the correct	

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Year Overview

Year 8

							mathematical notation and terms (e.g., "First, I'll draw two lines and add a small arrow on each one to show they are parallel..."). 3. **Swap:** Students swap roles, taking on the role of both the "card reader" and the "translator."	

Year Overview

Year 8

Term 3 Year 08 [Maths] | Topic 2 | [Area]

Topic Overview:
This unit develops students' understanding of key angle facts, including angles at a point, on a straight line, vertically opposite angles, and angles formed by parallel lines. Students apply these rules to calculate missing angles and justify their reasoning.

Prior & Subsequent Knowledge:
During KS2 and Year 7, students learned to measure angles and apply basic angle facts in simple problems. This term, they build on this by using corresponding, alternate and co-interior angles in more complex diagrams, preparing them for advanced geometric reasoning and proofs in KS4.

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 01	Area	G16 derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia	**To know that**: • Area is the measure of the **two-dimensional space** a shape occupies, and that it is always measured in **square units** (e.g., cm^2, m^2). • Area of a rectangle or square is found by multiplying its length by its width. • Area of a triangle is found by multiplying its base by its perpendicular height and then halving the result. • Area of a parallelogram is found by multiplying its base by its perpendicular height. • Area of a composite shape is the sum of the areas of the simple shapes it's made up of. • Surface area is the total area of all the faces of a 3D shape, and that it is	Review how to calculate the area of rectangle, triangle and parallelogram	**Check Point 01:** The formula for the area of a parallelogram is? **Check Point 02:** Which of these is not a correct unit for area? a) m^2 b) km^2 c) mm^2 d) cm **Check Out Questions (05 questions):** 1. What is the area of a rectangle with a length of 8 cm and a width of 5 cm? 2. A triangle has a base of 10 m and a perpendicular height of 6 m. What is its area? 3. A square has a side length of 7 mm. What is its area? 4. If a rectangle has an area of 48 m^2 and a length of 12 m, what is its width? 5. A triangle has an area of 20 cm^2 and a base of 8 cm. What is its perpendicular height?	**Activity 01:** Design a "logo" or a floor plan for a building using only rectangles, triangles, and parallelograms. You must use at least five shapes in total. Once you have drawn your design with measurements, calculate the total area **Check Point 01** Before calculating the final area, your teacher will check your design and your chosen measurements. They will check that you have at least five shapes and that the measurements are realistic. **Activity 02:** You are a real estate agent trying to sell a piece of land. The land is in the shape of an	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Area Perimeter Rectangle Triangle Parallelogram Length Width Base Perpendicular Height Square units Formula Composite shape **Literacy:** **The "Jumbled Formulae" Match-up** • **Objective:** To connect the name of a shape	**🎨 Art and Design** A fantastic way to use these concepts is by creating a piece of art. Students could be challenged to design a large mosaic or a repeating pattern using only these three shapes. They would have to calculate the area of each shape they use to determine how much of each colour material they would need. This blends mathematical precision with artistic creativity. **📐 Design and Technology**

Year Overview

Year 8

		also measured in square units.			irregular polygon. Your job is to divide the land into smaller, simpler shapes (rectangles, triangles, and parallelograms). Calculate the area of each section and the total area of the land. **Check Point 02:** Before you start your calculations, your teacher will check your plan for dividing the irregular shape. They will check if the sections are clearly defined and that you have used only rectangles, triangles, and parallelograms.		with its correct area formula. • **Instructions:** Provide students with two columns. One column contains the names of the shapes (rectangle, triangle, parallelogram). The other column contains the jumbled area formulas (A=bh, A=lw, A=½bh). Students must draw lines to match each shape to its correct formula. A short paragraph should then be written	In DT, students could become architects or urban planners. They can design a floor plan for a small house, a garden, or a skate park. They would need to use scale to draw their plans, then calculate the area of the different sections (e.g., the rectangular living room, the triangular flowerbeds, the parallelogram-shaped ramps) to figure out costs for flooring, turf, or concrete. This gives them a real-world, hands-on application of the formulae. **🌍 Geography** Geography offers a great opportunity to explore area on a larger scale. Students can look at maps and use the map's scale to calculate the area of different regions, like a park, a lake, or a city block. They could then use this to compare the sizes of different countries or even calculate population density by

Year Overview

Year 8

							explaining what each variable in the formulae represents. **Oracy: Think - Pair - Share:** **The "Justify Your Answer" Debate** • **Objective:** To justify a solution and defend it against potential errors. • **Instructions:** Provide a diagram of a parallelogram with the base and both the perpendicular height and the slanted side length clearly labelled with numbers. Ask a pair of students to find the area and	dividing the population of a city by its area. **🧪 Science** The concept of area is fundamental in science, especially in physics. You can link the lesson to the concept of **pressure**, which is defined as force divided by area (P=F/A). Students can understand why a pin has a sharp point: the force is concentrated over a very small area, creating high pressure. You could do a simple experiment with a blunt object and a sharp object to demonstrate the difference in pressure on a surface.

Year Overview

Year 8

							then present their solution to another pair. The second pair's job is to act as "detectives, " trying to spot if the first pair used the incorrect (slanted) height. This task promotes careful reading of diagrams and justificatio n of mathemati cal choices.	

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Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 02	Area	G16 derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia	• Area of a trapezium is found by adding the two parallel sides, halving the result, and then multiplying by the perpendicular height.	• Identify dimensions of a trapezium • Calculating area of trapezium	**Check Point 01:** Which formula is used to find the area of a trapezium? **Check Point 02:** If you double the height of a trapezium but keep the parallel sides the same, what happens to the area? **Check Out Questions (05 questions):** 1. A trapezium has parallel sides of length 10 cm and 14 cm, and a perpendicular height of 5 cm. What is its area? 2. The two parallel sides of a trapezium are 7 m and 11 m. The distance between them is 6 m. What is the area of the trapezium? 3. What is the area of a trapezium with parallel sides of 3.5 cm and 8.5 cm, and a height of 4 cm? 4. A builder is calculating the area of a trapezoidal wall for painting. The wall has parallel sides of 4 m and 6 m, and a height of 3 m. What is the area of the wall? 5. The parallel sides of a trapezium are 12 cm and x cm. The height is 5 cm and the area is 45 cm^2. What is the value of x?	**Activity 01:** Draw a shape that is made up of a trapezium and a rectangle. Your task is to find the total area of the entire shape. **Check Point 01** Identify the two individual shapes that make up the composite shape. **Activity 02:** Work out the total area of the compound shape **Check Point 02:** What is the area of the rectangle and the area of the trapezium?	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Trapezium Parallel sides Perpendicular height Base (a) Base (b) Area Formula Dimension Perimeter Inverse operation **Literacy:** **The Teacher's Assistant** 👩‍🏫 Imagine you are a teacher's assistant and a student in Year 7 is struggling to remember the area formula for a trapezium. Your task is to write a clear, step-by-step guide explaining **how to calculate the area of a trapezium**. Use a paragraph format and make sure to include all the key vocabulary. You must also include a simple, labelled diagram to go with your explanation. **Oracy: Think - Pair**	**Art and Design:** Trapeziums can be found in many examples of abstract art and are often used to create a sense of perspective. Students can create their own piece of art using only trapeziums and other shapes to build a city or landscape. **Geography:** Calculating the area of a region on a map is a great way to apply this concept. Many plots of land or geographical features are not perfect squares but can be approximated as irregular polygons, which can be broken down into shapes like trapeziums to estimate their area. **Engineering and Architecture:** The trapezium shape provides great stability and is often seen in the design of buildings and bridges. The **Trapezoidal Rule** is a method used in civil engineering to

Year Overview

Year 8

							- Share: In pairs, you will take turns explaining the following problem to your partner: "The area of a trapezium is 60 cm^2. The parallel sides are 8 cm and 12 cm. How do you find the perpendicular height?" Your partner's job is to listen and check your explanation. You must use the correct mathematical vocabulary. Try to be as clear as possible, explaining each step of your thinking.	calculate the area of irregular plots of land, which links directly to this topic. **Computer Science:** In computer graphics and game design, shapes like trapeziums are used to build 3D models and create realistic perspectives. Students could explore how a flat, 2D shape can be transformed into a 3D object on a screen.

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 03		G16 derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia	• Area of a trapezium is found by adding the two parallel sides, halving the result, and then multiplying by the perpendicular height.	Find missing sides given area of trapezium	**Check Point 01:** How do you calculate the area of a trapezium? **Check Point 02:** A garden plot is in the shape of a trapezium with an area of 84 m2. The parallel sides are 9 m and 12 m. What is the perpendicular height of the garden? **Check Out Questions (05 questions):** 1. A trapezium has an area of 54 cm^2. The lengths of its parallel sides are 9 cm and 18 cm. What is its perpendicular height? 2. A trapezium has an area of 42 m^2 and a height of 6 m. One of the parallel sides is 8 m. What is the length of the other parallel side? 3. The area of a trapezium is 120 mm^2. The height is 10 mm and one parallel side is 15 mm. What is the length of the other parallel side? 4. A field is shaped like a trapezium with an area of 200 m^2. The two parallel sides are 15 m and 25 m. What is the perpendicular distance between them? 5. A trapezium has an area of 91 cm^2. Its height is 7 cm and one parallel side is 11 cm. Find the length of the other parallel side.	**Activity 01:** **The Window Designer** 🏠 You are a window designer and have been asked to design a custom window in the shape of a trapezium. The area of the glass must be 1.2 m2. The parallel sides must be 1 m and 1.4 m. Your task is to find a suitable height for the window and calculate the total length of the frame needed. **Check Point 01** Calculate the perpendicular height of the window. **Activity 02:** Find the length of the two non-parallel sides. You will need to use Pythagoras' Theorem. **Check Point 02:** Calculate the total perimeter of the window to determine the length of the frame.	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Trapezium Parallel sides Perpendicular height Base (a) Base (b) Area Formula Dimension Perimeter Inverse operation **Literacy:** **The Teacher's Assistant** 👩‍🏫 Imagine you are a teacher's assistant and a student in Year 7 is struggling to remember the area formula for a trapezium. Your task is to write a clear, step-by-step guide explaining **how to calculate the area of a trapezium**. Use a paragraph format and make sure to include all the key vocabulary. You must also include a simple, labelled diagram to go with your explanation. **Oracy: Think - Pair**	**Art and Design:** Trapeziums can be found in many examples of abstract art and are often used to create a sense of perspective. Students can create their own piece of art using only trapeziums and other shapes to build a city or landscape. **Geography:** Calculating the area of a region on a map is a great way to apply this concept. Many plots of land or geographical features are not perfect squares but can be approximated as irregular polygons, which can be broken down into shapes like trapeziums to estimate their area. **Engineering and Architecture:** The trapezium shape provides great stability and is often seen in the design of buildings and bridges. The **Trapezoidal Rule** is a method used in civil engineering to

Year Overview

Year 8

							- Share: In pairs, you will take turns explaining the following problem to your partner: "The area of a trapezium is 60 cm^2. The parallel sides are 8 cm and 12 cm. How do you find the perpendicular height?" Your partner's job is to listen and check your explanation. You must use the correct mathematical vocabulary. Try to be as clear as possible, explaining each step of your thinking.	calculate the area of irregular plots of land, which links directly to this topic. **Computer Science:** In computer graphics and game design, shapes like trapeziums are used to build 3D models and create realistic perspectives. Students could explore how a flat, 2D shape can be transformed into a 3D object on a screen.

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 04	Area of Circles	G17 calculate and solve problems involving: perimeters of 2-D shapes (including circles) and areas of circles	• pi is the ratio between the diameter and circumference of a circle • pi is the ratio between the circle area and the square of the radius or the ratio between the diameter and the circumference • sectors are fractions of whole circles • pi is an irrational number • pi is conventionally rounded to 3.14	• identify and name features of a circle • Identifying radius and diameter of circles • Understanding what pi is • Calculating circumference of circles • Calculate the arc-length of a semi-circle or sector (when given angle) • Perimeter of a semi-circle or sector	**Check Point 01:** What is the approximate value of π? **Check Point 02:** If the diameter of a circle is doubled, what happens to its circumference? **Check Out Questions (05 questions):** 1. If the diameter of a circle is 10 cm, what is its radius? 2. A bicycle wheel has a radius of 30 cm. What is the circumference? 3. A sector has an angle of 90◦ and a radius of 8 cm. What is the length of its arc? 4. A semicircle has a diameter of 14 mm. What is its perimeter? 5. The circumference of a circular plate is 44 cm. What is its diameter?	**Activity 01:** **The Pizza Shop Problem** 🍕 You are the manager of a new pizza shop. You need to calculate the cost of a slice of pizza based on its size. The large pizza has a diameter of 32 cm and is cut into 8 equal slices. The price of the whole pizza is £16. Your task is to calculate the following for a single slice: • The area of one slice. • The perimeter of one slice. • The cost per cm^2. **Check Point 01** Calculate the area of the whole pizza. **Activity 02:** **The Sprinkler System** 🚿 A homeowner wants to install a new sprinkler system for their lawn. The sprinkler head is placed in the corner of a rectangular garden plot and can only rotate 90◦ (a quadrant). The jet of water reaches 15 m.	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Circle Sector Radius (r) Diameter (d) Circumference (C) Pi (π) Arc length Area of a circle Perimeter of a sector Semicircle Quadrant **Literacy:** **The Geometer's Journal** ✍️ You are a historical geometer, and you have just discovered the relationship between the circumference and the diameter of a circle. Write a journal entry documenting your discovery. You must explain how you found that the ratio is always the same, no matter the size of the circle, and how you named this special number 'pi' (π). Your entry should	**Science:** Pi and the properties of circles are fundamental in physics. They are used to describe circular motion, gravitational orbits, and the shape of planets. The concept of circumference is also crucial in calculating the distance travelled by wheels or gears. **Art and Design:** Circles and sectors are essential building blocks in visual art. They are used in creating mandalas, stained glass patterns, and many forms of abstract and geometric art. Students can explore using a compass to create intricate designs based on circles. **Engineering:** Engineers use the properties of circles to design everything from car tires and gears to tunnels and pipes. The ability to calculate circumference and

Year Overview

Year 8

					Your task is to: • Calculate the area of the lawn that the sprinkler can water. • Calculate the length of the arc of water. • Draw a diagram of the garden and the watered area to scale. **Check Point 02:** Draw a scaled diagram showing the garden and the watered area.		be clear and well-structured, as if you were writing for other geometers to understand your work. **Oracy: Think - Pair - Share:** **The Perfect Pitch** 🗣️ In pairs, you will prepare and deliver a one-minute presentation to a 'client' (your teacher) who is a baker. Your client wants to know the best way to cut a circular cake into equal sectors. You need to explain, using correct mathematical language, how to calculate the arc length and area of each sector so that every slice is identical. You must use the terms 'radius', 'circumference', and 'sector' in your pitch.	area is essential for designing efficient and functional systems. **History:** The discovery of pi is a fascinating historical journey that spans ancient civilizations. Students can research how different cultures, like the ancient Egyptians, Babylonians, and Greeks, approximated the value of π. This links mathematics directly to historical timelines and cultural development.

Year Overview

Year 8

Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 05	G17 calculate and solve problems involving: perimeters of 2-D shapes (including circles) and areas of circles	• Area of a circle is found using the formula $A=\pi r^2$, where r is the radius.	• Calculate the area of a circle • Calculate the area of a sector (when given their angle)	**Check Point 01:** How many times larger is the area of a circle with a radius of 6 cm than a circle with a radius of 3 cm? **Check Point 02:** What is the area of a quadrant (quarter circle) with a radius of 20 m? **Check Out Questions (05 questions):** 1. What is the area of a circle with a radius of 4 cm? 2. If the diameter of a circle is 10 m, what is its area? 3. The area of a circular rug is 50.27 m^2. What is its radius? 4. A sector has an angle of 90° and a radius of 10 cm. What is its area? 5. The area of a sector is 40 cm^2. If its radius is 8 cm, what is its angle?	**Activity 01:** **The Design Challenge** 🎨 You are a graphic designer. Your task is to create a company logo using a composite shape. The logo consists of a square with a quarter circle (quadrant) cut out from each of its four corners. The side length of the square is 10 cm, and the radius of each quadrant is 5 cm. Your task is to: • Calculate the total area of the four quadrants combined. • Calculate the area of the central shape that remains. **Check Point 01** Subtract the area of the four quadrants from the area of the square to find the area of the logo. **Activity 02:** **The Sprinkler System** 💦 A rotating sprinkler is placed in the corner of a rectangular lawn. It can	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Circle Sector Radius (r) Diameter (d) Pi (π) Area Formula Semicircle Quadrant Angle Area of a sector Composite shapes **Literacy:** **The Architect's Memo** 📝 You are an architect designing a new community park. You need to write a memo to your team outlining the materials required for a new circular seating area and a fan-shaped flowerbed. Your memo must explain how to calculate the area of both the circle and the sector to ensure you order enough of the correct materials. You need to use the key	**Science:** The area of a circle is used in a wide range of scientific fields. For example, in biology, it can be used to calculate the surface area of a cell to volume ratio. In physics, it is used to calculate the cross-sectional area of a wire to determine its resistance. **Architecture and Construction:** Architects and engineers use the area of circles and sectors when designing and building curved structures, arches, and domes. They need to calculate the area to determine the quantity of materials needed for construction. **Geography:** Students can use the concept of area to calculate the size of a circular plot of land or the land area covered by a sector-shaped forest. This links directly to

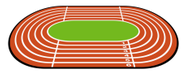
Year Overview

Year 8

					rotate 120° and sprays water up to a distance of 10 m. Your task is to: • **Calculate the area of the lawn that is watered.** • **If a bag of lawn seed covers 20 m^2, how many bags are needed to seed the watered area?** • **The total cost of the project is £250. What is the cost per square metre to the nearest penny?** **Check Point 02:** Identify the shape the water makes and calculate the area of the watered region.		terminology and formulas correctly. **Oracy: Think - Pair - Share:** **The Landscaper's Pitch** 🗣️ In pairs, you are landscapers pitching to a client who wants to know the cost of a new circular lawn. The lawn has a radius of 6 m and the cost of turf is £25 per square metre. Your task is to explain, clearly and concisely, how you will calculate the area and the total cost. Take turns explaining the different parts of the calculation.	map skills and land management. **Art and Design:** Sectors are a key element in creating designs on a circular canvas, such as a clock face or a pie chart. Students can explore how changing the angle of a sector affects its area and visual impact in a design.

Year Overview

Year 8

Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 06	G17 calculate and solve problems involving: perimeters of 2-D shapes (including circles) and areas of circles	• Area of a circle is found using the formula $A=\pi r^2$, where r is the radius. • Area of a composite shape is the sum of the areas of the simple shapes it's made up of.	• Solve problems with circumference and area in different contexts including with compound shapes • use pi on a calculator • manipulate compound shapes to solve problems • leave an answer in terms of pi	**Check Point 01:** If you double the radius of a circle, what happens to its circumference and area? **Check Point 02:** A semicircle has a diameter of 10 cm. What is its perimeter in terms of pi (π)? **Check Out Questions (05 questions):** 1. A circle has a circumference of 20π mm. What is its area in terms of pi (π)? 2. A composite shape is made of a square with a semicircle on top. The side length of the square is 8 cm. What is the total area of the shape in terms of pi (π)? 3. The area of a sector with a radius of 12 cm is 24π cm^2. What is the angle of the sector? 4. A circular swimming pool has a circumference of 18π m. What is the area of the pool? 5. A composite shape is a rectangle with a semicircle cut out from one side. The rectangle measures 10 m by 8 m, and the diameter of the semicircle is 8 m. What is the area of the remaining shape in terms of pi (π)?	**Activity 01:** **The Running Track** 🏃 A running track is made up of a rectangle with two semicircles at each end. The straight parts of the track are each 100 m long, and the distance between them is 60 m.  Your task is to: • **Calculate the length of the entire track.** • **Calculate the area of the entire track.** • **Find the area of the track's surface if it is 1.5 m wide, leaving your answer in terms of pi (π).** **Check Point 01** Calculate the total area of the track, considering both the rectangle and the two semicircles. **Activity 02:** **The Pizza Box Problem** 🍕 You have a circular pizza with a diameter of	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Circumference Area Pi (π) Radius (r) Diameter (d) Sector Arc length Composite shape In terms of pi Semicircle Quadrant **Literacy:** **The Theme Park Designer** ✍️ You are a designer for a new theme park. Write a detailed report for your manager about the design of a new ride called 'The Centrifuge'. This ride has a circular platform with a diameter of 15 m and is made up of a central circular platform and a semicircular entrance ramp. Your report must explain: • How to calculate	**Engineering and Construction:** The principles of circumference and area are vital in engineering. A civil engineer uses these concepts to design circular tunnels and calculate the amount of material needed for construction. A mechanical engineer uses them to design gears and pulleys. **Science:** In physics, the concept of circular motion relies on understanding circumference. In biology, students might calculate the area of a petri dish to determine the space for bacteria growth. **Art and Design:** Artists use circles and sectors to create mandalas and other geometric patterns. Understanding these concepts allows for precise and aesthetically pleasing designs. Students can experiment with

Year Overview

Year 8

					40 cm. It fits exactly into a square box. Your task is to: • **Calculate the area of the pizza.** • **Calculate the area of the square box.** • **Find the area of the "wasted space" (the corners of the box not covered by the pizza), leaving your answer in terms of pi (π).** **Check Point 02:** Determine the radius of the pizza.		the total area of the ride, including the entrance ramp. • How to calculate the circumference of the main circular platform to determine the length of the safety fence needed. • The report should use the correct mathematical vocabulary and include your final answers in terms of pi (π). **Oracy: Think - Pair - Share:** **Explain It to a Friend** 🗣️ In pairs, you will take turns explaining the following problem to your partner: "A	compasses and rulers to create their own circular patterns. **Architecture:** Circular and semi-circular shapes are a common feature in architecture, from domes and arches to windows and building layouts. An architect needs to understand how to calculate the area of these shapes for planning and costing purposes.

Year Overview

Year 8

							circle has a circumference of 10π cm. What is its area in terms of pi?" Your partner's job is to listen and check your explanation. You must use the correct mathematical vocabulary and clearly explain each step of your thinking, showing how you use the circumference to find the radius, and then the radius to find the area.	

Year Overview

Year 8

Term 3 Year 08 [Maths] | Topic 3 | Drawing Triangles

Topic Overview:
This unit introduces students to constructing accurate triangles using given side lengths and angles. Students learn to use a ruler, protractor and compass to draw SSS, SAS and ASA triangles and understand when a triangle can or cannot be constructed from given information.

Prior & Subsequent Knowledge:
During KS2 and Year 7, students learned to measure and draw lines and angles accurately and identify basic triangle types. This term, they will use these skills to construct triangles from given sides and angles, preparing them for congruency, geometric reasoning and more advanced constructions in KS4.

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 01	Congruent Triangles	G5 use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles	To know that • **congruent** means two shapes are exactly the same size and shape. • for two triangles to be congruent, their **corresponding sides and angles** must be equal. • To know how to identify and label **corresponding sides and angles** in two triangles.	• Drawing lines and angles	**Check Point 01:** What tool is used to measure and draw angles? **Check Point 02:** How should you position a protractor to measure an angle correctly? **Check Out Questions (05 questions):** 1. How would you draw a line segment that is exactly 5 cm long? 2. How do you use a compass to create two parallel lines? 3. What kind of angle is 85°? 4. If you draw a line segment of 7 cm and then another line segment of 7 cm starting from the same point, what kind of triangle can you make? 5. What is the sum of the angles in a triangle?	**Activity 01:** **The Robot's Path** 🤖 A small robot is programmed to draw shapes. Your task is to write a sequence of instructions for the robot to draw a triangle with sides of 5 cm and 7 cm and a 60° angle between them. The robot's commands are: • MOVE FORWARD (distance) • TURN LEFT (degrees) • TURN RIGHT (degrees) You must write the complete sequence of commands for the robot to draw the triangle and end up at the starting	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Line segment Angle Protractor Ruler Compass Straightedge Parallel Perpendicular Bisect Acute angle Obtuse angle **Literacy:** **The Geometer's Guidebook** ✍️ You are writing a step-by-step instruction manual for a new geometry set. Your task is to write a clear and concise guide on **how to draw an angle of 75°** and **how to**	**Art and Design:** The use of rulers, protractors, and compasses is fundamental to creating geometric art, technical drawings, and architectural sketches. Students can explore how precise measurements are used in design. **Engineering and Architecture:** Engineers use these skills to draw plans and diagrams for buildings, bridges, and machines. Accuracy in drawing lines and angles is critical for ensuring structures are safe and stable.

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Year Overview

Year 8

					point, facing the same direction. **Check Point 01** Write the commands to draw the first two sides and the angle. **Activity 02:** **The Treasure Map** 🗺️ You are an explorer creating a treasure map. You need to draw a map with a precise location for the treasure. Your instructions for the map are: 1. From the 'Start' point, draw a line segment 9 cm long. 2. From the end of that line, draw a line segment 6 cm long at a 110° angle to the first line. 3. The treasure is located at the third vertex of the triangle. Your task is to: • **Draw the map exactly to the scale provided.** • **Measure and record the length of the final side.** • **Measure and**		**draw a line segment of 8.5 cm**. Use bullet points or numbered steps and ensure your instructions are easy for a Year 7 student to follow. Include a simple diagram or sketch to illustrate your instructions. **Oracy: Think - Pair - Share:** **The Practical Partner** 🗣️ In pairs, one person will have a ruler and pencil, and the other will have a protractor. The partner with the protractor will give clear instructions to their partner on how to draw a triangle with sides of 10 cm and 7 cm, with a 40° angle between them (SAS). The roles then switch, and the new 'instructor' will guide their partner to draw a triangle with a 50° angle, a 9 cm side, and a 70° angle (ASA). This task emphasizes	**Geography:** Map-making and navigation rely on the accurate drawing and measurement of lines and angles. Students can learn how bearings and distances are used to plot a course. **Computer Science:** The principles of drawing lines and angles are the foundation of computer graphics. Students can learn about how a computer program uses coordinates and angles to create shapes on a screen.

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Year Overview

Year 8

					record the size of the two remaining angles. **Check Point 02:** Accurately measure the two unknown angles in the triangle.		precise language and communication.	

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 02	Congruent Triangles	G5 use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles	To know that • There are **four specific conditions** that can be used to prove that two triangles are congruent. • **SSS (Side, Side, Side)** condition proves congruence if all three sides of one triangle are the same length as the three corresponding sides of the other. • **SAS (Side, Angle, Side)** condition proves congruence if two sides and the angle *between* them are the same as the two corresponding sides and included angle of the other. • **ASA (Angle, Side, Angle)** condition proves congruence if two angles and the side *between* them are the same as the two corresponding angles and included side of the other. • **RHS (Right-angle, Hypotenuse, Side)** condition only works for right-angled triangles and proves congruence if the hypotenuse and one other side are the same length.	• Drawing SAS ASA and triangles • Drawing SSS triangles	**Check Point 01:** Which conditions guarantee that two triangles are congruent? **Check Point 02:** Which condition applies only to right-angled triangles? **Check Out Questions (05 questions):** 1. Which two conditions require you to know at least one angle? 2. If two triangles have sides of 5 cm, 7 cm, and 10 cm, and another triangle has sides of 7 cm, 10 cm, and 5 cm, which condition proves they are congruent? 3. A triangle has angles of 45° and 60° and a side of 8 cm between them. Which condition could prove congruence? 4. A triangle has sides of 8 cm and 10 cm, with a 40◦ angle. Can you prove congruence using SAS if the angle is not between the two sides? 5. If two triangles have the same three angles, does this prove they are congruent?	**Activity 01:** **The Bridge Designer** 🌉 You are a civil engineer designing a small footbridge. You need to design the triangular supports for the bridge. You have been given two specifications: 1. The base of each support triangle must be 8 m long. 2. The two angles at the base must be 55° and 70°. Your task is to: • **Draw two different versions of the support triangle using the ASA condition.** • **Explain why these two triangles are congruent, even though they look different in your drawing.** • **Calculate the length of the third side for both triangles.** **Check Point 01** Explain why the ASA condition guarantees that all corresponding parts	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Congruent Side-Side-Side (SSS) Side-Angle-Side (SAS) Angle-Side-Angle (ASA) Right-Angle-Hypotenuse-Side (RHS) Corresponding sides Corresponding angles Protractor Compass Straightedge **Literacy:** **The Geometry Detective** 🕵️ You are a detective investigating a crime scene. A map has been found with two triangles drawn on it. You need to write a report for your team proving that the two triangles are congruent. You must use one of the conditions (SSS, SAS, or ASA) as your evidence. Your report should clearly state which	**Architecture and Engineering:** Congruent triangles are essential for structural stability. Architects and engineers use them to create strong, rigid frameworks for buildings, bridges, and other structures. **Art and Design:** Artists use geometric principles, including congruence, to create patterns and designs. Quilting and mosaic art, for example, often rely on identical shapes being repeated to form a larger pattern. **Geography:** Triangulation, a method for finding a location by using the measurements of a triangle, is a key skill in navigation and surveying. Students can learn how congruent triangles can be used to prove the position of landmarks. **Computer Science:** In computer graphics

Year Overview

Year 8

					are equal. **Activity 02:** **The Treasure Hunt** 🗺️ You are creating a treasure map with a hidden prize. The instructions for finding the treasure are based on creating a congruent triangle to a known starting triangle. **The known triangle has sides of 6 cm and 8 cm, with a 50◦ angle between them.** Your task is to: • **Draw the starting triangle using the SAS condition.** • **Draw a second triangle, using different angles and sides, but prove it is congruent to the first using the SSS condition.** • **Write down the measurements of all sides and angles of the second triangle.** **Check Point 02:** Use these three new side lengths to draw a second triangle and explain why it is congruent to the first using the SSS condition.		condition you used, list the corresponding sides and angles, and explain why this proves the triangles are congruent. **Oracy: Think - Pair - Share:** **The Congruence Coach** 🗣️ In pairs, you will take on the role of a 'Congruence Coach'. One person will describe a triangle to their partner using only one of the three congruence conditions (e.g., "Draw a triangle with a 7 cm side, a 50◦ angle, and a 6 cm side"). The partner must then draw the triangle and verbally explain which condition was used and why the triangle they drew is congruent to the one described.	and 3D modeling, congruent triangles are used to build up complex shapes and to ensure that objects are rendered accurately and consistently.

Year Overview

Year 8

	Lesson Title	National Curriculum or Specification Link	Declarative Knowledge	Procedural Knowledge	Diagnostic questions for each phase of the lesson.	Push Yourself Activities	Resources Link	Literacy and Oracy	Cross Curricular
Lesson 03	Congruent Triangles	G5 use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles	To know that • **bisecting** a line segment means to divide it into two equal parts. • **A perpendicular bisector** of a line segment is a line that cuts the segment exactly in half and is perpendicular to it. • every point on the perpendicular bisector of a line segment is equidistant from the two endpoints of the segment. • **perpendicular bisector** can be constructed using a compass and a straightedge. • **bisecting** an angle means to divide the angle into two equal parts. • **An angle bisector** is a line that passes through the vertex of an angle and divides it into two equal angles. • every point on the angle bisector is equidistant from the two sides that form the angle. • **An angle bisector** can be constructed using a	• Bisecting a line segment • Bisecting an angle	**Check Point 01:** What does the term 'bisect' mean in geometry? **Check Point 02:** When bisecting a line segment, what should the compass setting be? **Check Out Questions (05 questions):** 1. What is a key property of the perpendicular bisector of a line segment? 2. If you bisect a 120◦ angle, what size are the two new angles? 3. Which of these is another name for a line that divides a line segment into two equal parts? 4. A point is on the bisector of an angle. What is true about its distance from the two sides of the angle? 5. If a line is both a bisector and perpendicular to a line segment, what is it called?	**Activity 01:** **The Town Planner** 🏡 You are a town planner designing a new town with two main roads that meet at an angle. The mayor wants to build a new library that is exactly the same distance from both roads. Your task is to: • **Draw two lines that meet at an angle of your choice.** • **Use a compass and straightedge to find the exact location for the library.** • **Explain why your method works using the term 'equidistant'.** **Check Point 01** Explain, using diagrams, why any point on the bisector is equidistant from the two lines. **Activity 02:** **The Treasure Hunt** 🗺️ An old map shows two treasure chests, A and B. You know there is a secret	Slides Worksheet Differentiated Worksheet Check Out | Google Form	**Key Terminology:** Line segment Angle Bisect Perpendicular bisector Angle bisector Equidistant Compass Straightedge Arc Vertex **Literacy:** **The Geometer's Logbook** ✍️ You are a geometer on an expedition, and you have discovered a mysterious map. It has a single straight path on it, but you need to find a central point that is exactly in the middle of the path. The map also shows a V-shaped river, and you need to find a path that is exactly in the middle of the river. Write a logbook entry explaining how you used a compass and straightedge to	**Art and Design:** Geometric constructions are the foundation of many art forms, from creating intricate mandalas to designing tessellations. Artists use these precise methods to ensure their patterns are symmetrical and balanced. **Engineering and Architecture:** Engineers and architects use these skills to create accurate drawings and designs. The concept of a perpendicular bisector is used in constructing perpendicular walls, and the angle bisector is used in creating symmetrical designs. **Geography:** Surveyors use the principles of bisecting lines and angles to create accurate maps. They can use these techniques to find the midpoint between two locations or to

Year Overview

Year 8

		compass and a straightedge.			third treasure exactly in the middle of a straight line between them. The map also says that the third treasure is the same distance from two other key landmarks, a giant oak tree and a large rock, which form an angle. Your task is to: • **Draw a line segment to represent the path between the two treasure chests A and B.** • **Draw an angle to represent the position of the oak tree and the rock.** • **Use your knowledge of bisecting lines and angles to find the exact location of the third treasure.** **Check Point 02:** Mark the point where the two bisectors intersect, which is the location of the treasure.		solve both of these problems. Use a step-by-step format and include the correct mathematical terminology. **Oracy: Think - Pair - Share:** **The Practical Partner** 🗣️ In pairs, you will have a piece of paper, a compass, and a straightedge. One person will act as the 'Director' and the other as the 'Geometer'. The Director will give clear, verbal instructions to the Geometer on how to bisect a line segment. The Geometer must follow the instructions precisely. After successfully bisecting the line, the roles will switch, and the new Director will give instructions on how to bisect an angle. This task emphasizes clear communication and precise language.	create a path that is equidistant from two landmarks. **Computer Science:** In computer graphics, algorithms use these mathematical principles to draw shapes and lines on a screen. For example, a program might bisect an angle to create a new line for a complex design

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Year Overview

Year 8