**TOPIC OVERVIEW DOCUMENT**

# YEAR 9

**TOPIC OVERVIEW:**

In Year 9, these topics build on Year 8 learning in coordinates, transformations, angles, ratio and proportional reasoning. Students extend their understanding by justifying geometric results, using vectors, applying Pythagoras' Theorem, and exploring enlargement and similarity. Their earlier work with ratio is developed further through scaling, proportional problems, speed, density and rates. This progression strengthens logical reasoning, mathematical communication and problem solving.
Across these topics, students develop spatial awareness, logical reasoning, algebraic fluency and the ability to solve multi-step problems, providing a strong foundation for GCSE Maths.

| Key Vocabulary (T2) | Key Vocabulary (T3) | Core knowledge | Disciplinary Skills |
|---|---|---|---|
| Interpret, identify, describe, compare, justify, explain, reason, apply, calculate, recognise, represent, determine, investigate, construct, transform, scale, relate, predict, evaluate, accurate, logical, relationship, method, strategy, sequence, proportion, conclusion. | Parallel.<br>Angle.<br>Rotation.<br>Translation.<br>Square Number<br>Enlargement.<br>Integer.<br>Proportion.<br>Ratio.<br>Conversion | Students develop geometric and proportional reasoning through work on deduction, transformations, Pythagoras' Theorem, enlargement, similarity, ratio and rates. They learn to justify geometric results, rotate and translate shapes, calculate missing lengths, use scale factors and identify similar shapes. Students also develop confidence in ratio and proportion, using proportional reasoning to solve problems involving sharing, scaling, speed, density and other rates. Together, these topics strengthen logical reasoning, accuracy and problem-solving skills. | Students develop their understanding of geometry, proportion and mathematical reasoning through deduction, transformations, Pythagoras' Theorem, similarity, ratio and rates. They use angle facts and properties of shapes to find unknown values and justify conclusions, while rotations, translations and enlargements develop their understanding of how shapes move and change. Pythagoras' Theorem is used to calculate missing lengths and solve problems involving right-angled triangles. Students also strengthen their proportional reasoning through similarity, ratio and direct and inverse proportion. They apply these skills to real-life problems, including best buys and compound measures such as speed, density and pressure. They learn to use and rearrange formulas, convert units and interpret graphs. |

| Checkpoint: Vocab/ Knowledge/ Disciplinary skill(s) | What does this assessment look like? | Which disciplinary skills do I need to be successful? |
|---|---|---|
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| Checkpoint 1:<br>Three dimensional shapes | You will complete a skills check<br>You will be reassessed during the Mastery lesson | You need to recognise and describe 3-D shapes, identify faces, edges and vertices, and visualise nets and different representations. You should be able to calculate surface area and volume accurately, select appropriate formulae and units, and apply spatial reasoning to solve problems. |
| Checkpoint 2:<br>Construction and congruency | You will complete a skills check<br>You will be reassessed during the Mastery lesson | You need to use geometric tools accurately to construct shapes, bisectors and triangles, and follow geometric instructions carefully. You should be able to recognise congruent shapes, apply triangle congruence rules, and justify your conclusions using clear mathematical reasoning. |
| Checkpoint 3:<br>Numbers | You will complete a skills check<br>You will be reassessed during the Mastery lesson | *You need* **to** work confidently with different types of numbers, including integers, fractions, decimals, percentages, powers and roots**.** You should be able to calculate accurately, use estimation and rounding, recognise number relationships, select efficient methods and apply your skills to solve problems in unfamiliar contexts. |
| Checkpoint 4:<br>Using percentages | You will complete a skills<br>You will be reassessed during the Mastery lesson | You need to calculate percentages of amounts, percentage increases and decreases, and use percentage multipliers. You should be able to choose efficient methods, apply percentages to real-life problems, work accurately and check whether your answers are reasonable. |
| Checkpoint 5:<br>Maths and money | You will complete a skills check<br>You will be reassessed during the Mastery lesson | *You need to* calculate percentages of amounts, percentage increases and decreases, and use percentage multipliers**.** You need t**o** choose efficient methods, apply percentages to real-life problems, work accurately and check that your answers are sensible**.** |

| **Milestone assessment:** |
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| The average of the following skills checks :<br>Three dimensional shapes; Construction and congruency; Numbers; Using percentages; Maths and money |

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| **Vocab quiz:** | **Knowledge tasks:** | **Disciplinary tasks:** |
|---|---|---|
| Parallel.<br>Angle<br>Rotation.<br>Translation.<br>Square Number<br>Enlargement.<br>Integer.<br>Proportion.<br>Ratio.<br>Conversion. | Students develop confidence in geometry and proportion by working with transformations, Pythagoras' Theorem, similarity, ratio and rates. They learn to calculate missing lengths, use scale factors, transform shapes and justify geometric results. Students also apply ratio and proportion to practical problems involving sharing, scaling, speed and density. These topics strengthen logical reasoning, accuracy and problem-solving, while building important foundations for GCSE Maths. | Students develop confidence in geometry, proportion and problem solving. They learn to use transformations, Pythagoras' Theorem, similarity, ratio and proportion to solve problems and explain their reasoning. Students also apply these skills to real-life situations involving speed, density, pressure, best buys and unit conversions, building accuracy and confidence for GCSE Maths. |

How can I **achieve** in this topic?

- Complete tasks on SPARX
- Engage 100% in lessons
- Make good notes/examples in lessons and use them

*Further research:*

- Home | NRICH
- Maths - BBC Bitesize