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| Year 11 – Foundation Tier | **Topic: Unit 18 – Fractions, Indices and Standard Form****Period:** Autumn 1 |
| **Overview of topic:**Students will build on their knowledge from KS3 and year 10 in dealing with and calculating with fractions, powers, roots and numbers expressed in standard form.* Multiplying and Dividing Fractions
* The Laws of Indices
* Writing large numbers in Standard Form
* Writing small numbers in Standard Form
* Calculating with Standard Form

In addition to continued study within the scheme of work, year 11 students will complete regular GCSE practice papers and use analysis of those results to inform revision of prior knowledge, tailored to the individual needs of different classes and students. |
| **Key** **knowledge:*** What is the reciprocal of 4, 1/2, −2, −1/2?
* Students should be able to justify when fractions are equal and provide correct answers as a counter-argument.
* Links with other areas of mathematics should be used where appropriate to embed the notion that fractions are not just used in isolation, e.g. use 6 1⁄2 cm instead of 6.5 cm.
* Write 51 080 in standard form.
* Write 3.74 × 10−6 as an ordinary number.
* What is 90?
* Link with other areas of mathematics, such as compound measures, by using speed of light in standard form.

**Key vocabulary:**

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| Tier 2 | Tier 3 |
| * Add
* Subtract
* Multiply
* Divide
* Mixed
* Improper
* Fraction
* Decimal
* Power
* Reciprocal
* Index
 | * Standard form
* Indices
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 | **Key skills:** * Add and subtract mixed number fractions;
* Multiply mixed number fractions;
* Divide mixed numbers by whole numbers and vice versa;
* Find the reciprocal of an integer, decimal or fraction;
* Understand ‘reciprocal’ as multiplicative inverse, knowing that any non-zero number multiplied by its reciprocal is 1 (and that zero has no reciprocal because division by zero is not defined).
* Use index laws to simplify and calculate the value of numerical expressions involving multiplication and division of integer powers, fractions and powers of a power;
* Use numbers raised to the power zero, including the zero power of 10;
* Convert large and small numbers into standard form and vice versa;
* Add, subtract, multiply and divide numbers in standard form;
* Interpret a calculator display using standard form and know how to enter numbers in standard form.
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| **Co-curricular opportunities:** Standard form is used throughout the scientific disciplines of Biology, Chemistry and Physics, and in technology subjects such as engineering and electronics to express and work with very large and very small values – such as the distance between planets or the size of tiny electrical charges. | **Key reading skills taught and key texts:**Clarify – identify key vocabulary in questions and be fluent in understanding the meaningsQuestion – from a worded question, what Maths is required to be done in order to get a solution?**Wider Reading Opportunities/Links:** |
| **How can I use this information at home?*** Conversation starters with your children to discuss their learning
* Support your child in carrying out independent research around the topic
* Visit your local library (or BorrowBox), museums, or other locations to explore the topic
* Promote books/other texts that explore this topic (see reading section)
* Help your child to learn the key vocabulary
* Encourage practice and consolidation through completion of homework, TTRockStars and using other online learning platforms
* Encourage them to practice their mathematical skills in a variety of everyday situations wherever the opportunity arises.
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