Year 8 Maths Topics 10, 11 & 12
Fractions & Percentages, Standard Index Form & Number Sense

Week 1

This topic is going to look at fractions and percentages. The first thing we will do is recap from Y7 how to convert between fractions, decimals and percentages.
You will then learn how to work out a fraction of an amount and a percentage of an amount.
To find a fraction of an amount you divide the amount by the denominator and multiply it by the numerator.

E.g. $\frac{3}{4}$ of 60 = 45 60 ÷ 4 = 15 x 3 = 45

To find 50% of a number: ÷ 2
To find 25% of a number: ÷ 4
To find 10% of a number: ÷ 10
To find 5% of a number: ÷ 10 ÷ 2
To find 1% of a number: ÷ 100

Week 2

This week we are going to look at percentage decrease and increase.
A **percentage decrease** is where you work out the percentage and subtract it from the original amount. This is like when there is a sale on in a shop. A **percentage increase** is where you work out the percentage and add it onto the original amount. This is how interest works on loans and bank accounts.

E.g. Reduce £120 by 30%
10% of £120 = 120 ÷ 10 = £12
30% = £12 x 3 = £36
£120 - £36 = **£84**

We will also look at how we can use a calculator to do these calculations. To do this we will look at a new method which uses decimal multipliers.

Week 3

This week we will write one value as a percentage of another by first writing it as a fraction and then converting it to a fraction over 100 to get a percentage. An example of this could be to compare test scores in different subjects.

E.g. 18 out of 20 = $\frac{18}{20} = \frac{90}{100} = 90\%$

On a calculator you would do top ÷ bottom and multiply by 100.
We will put our skills to the test by solving real life percentage problems.

Higher learners will also work backwards to find the original amount before the decrease or increase and also work with percentages over 100%.

Week 4

This week we will learn how to write really large numbers in standards form and really small numbers in standard form.
Standard form is way of shortening long numbers.
The rules of standard form are

$$A \times 10^n$$

where A is a number between 1 and 10 and n is an integer.

E.g. 230 000 000 = 2.3 x 10^8 (the decimal point jumps 8 places forwards)

E.g. 0.0000000084 = 8.4 x 10^{-9} (the decimal point jumps 9 places backwards)

Week 5

This week we will start to do calculations with numbers in standard form.
If the base and power are the same you can just add or subtract the front numbers and keep the base the same.
E.g. 2 x 10^4 + 7 x 10^4 = 9 x 10^4 (if they add up to 10 or over you will need to adjust the power)
If the base and powers are different you will have to turn them into ordinary numbers carry out the calculation and then convert it back to standard form.
E.g. 2 x 10^4 + 7 x 10^5 = 20000 + 700000 = 720000 = 7.2 x 10^5

To multiply and divide numbers in standard form we will use what we learnt in the Indices topic. When multiplying indices you add the powers and when dividing you subtract the powers.
E.g. 2x10^4 x 3x10^7 = 6x10^{11} or 9x10^{12} ÷ 3x10^4 = 3x10^8

Week 6

This week our topic is Number Sense. We will recap how to round a number and how to estimate.
Rounding is when you use a less accurate number but it is easier to use. You can round numbers to a certain place value or significant figure. You just look to the right of the number you want to round to and follow the rules. The rounding rules are
0, 1, 2, 3, 4 round down
5, 6, 7, 8, 9 round up
E.g. 47285 rounded to the nearest thousand is 47 000 as the 2 said round down.
To estimate a calculation you round each number in the calculation to 1 significant figure and then carry it out.
We will also convert between metric units.

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Week 1

Questions	Answers
How do you find a fraction of an amount?	Divide the amount by the denominator and multiply it by the numerator.
How do you find 50% of an amount?	Divide by 2
If I divide an amount by 10, what percentage have I found?	10%
What do you divide by to find 25%?	4
How could I find 35% of an amount?	By finding 25% and 10% and adding them together

Week 2

Questions	Answers
What is a percentage increase?	When a percentage is added onto the original amount.
What is a percentage decrease?	When a percentage is subtracted from the original amount.
Give a real life of example when you might see a percentage decrease.	In a sale in a shop eg 10% off
Give a real life of example when you might see a percentage increase.	On a loan or bank account.
What can you use when using a calculator to work it out?	Decimal multipliers

Week 3

Questions	Answers
How do you write one value as a percentage of another value?	First write it as a fraction and then convert it to a fraction over 100 to get the percentage.
How could you do it on a calculator?	Type in top ÷ bottom and multiply by 100.
When could this be used in real life?	To compare test scores.

Week 4

Questions	Answers
What is standard form?	A way of shortening long numbers.
What are the rules of standard form?	$A \times 10^n$ where A is a number between 1 and 10 and n is an integer.
What is 2.3 x 10^8 as an ordinary number?	230 000 000
How do you write 0.0000000084 in standard form	8.4 x 10^{-9}
What does the power on the standard form tell you?	How many places the decimal will move to make the ordinary number.

Week 5

Questions	Answers
How do you add numbers in standard form when the base and power are the same?	Add or subtract the front numbers and the base stays they same.
How do you add numbers in standard form when the base and power are not the same?	turn them into ordinary numbers carry out the calculation and then convert it back to standard form.
When multiplying numbers in standard form what do you do with the powers?	Add the powers when multiplying.
When dividing numbers in standard form what do you do with the powers?	Subtract the powers when dividing.
When might you need to adjust your answer?	If the front number is not between 1 and 10.

Week 6

Questions	Answers
Why do we round numbers?	To make them easier to use.
If a number is followed by a 5,6,7,8,9 how is it rounded?	It is rounded up
What numbers are needed to make it round down?	0,1,2,3,4
How do you estimate a calculation?	Round each number in the calculation to 1 significant figure and then carry it out.
Can you think of a real life example of rounding?	A new TV costs £799 but you say it cost £800.