Scheme of Learning: Year 8 Spring Term

Topic Sequence: Developing Number

10	11	12
Fractions and Percentages	**Standard Index Form**	**Number Sense**

Topic Overview: Fractions and Percentages

This block focuses on the relationships between fractions and percentages, including decimal equivalents, and using these to work out percentage increase and decrease. Students also explore expressing one number as a fraction and percentage of another. Both calculator and non-calculator methods are developed throughout to support students to choose efficient methods. Financial maths is developed through the contexts of e.g. profit, loss and interest The higher strand also looks at finding the original value given a percentage or after a percentage change.

Lesson Sequence:

Convert fluently between key fractions, decimals and percentages
This revises year 7 work on mental conversion of key fractions, decimals and percentages. Use of diagrams such as the 100 square, and number lines to compare these will help to secure understanding. Students should be confident in articulating their methods and using them to compare different forms **Calculate key fractions, decimals and percentages of an amount without a calculator**
Students will have visited finding fractions and percentages of amounts during year 7. This step will provide a further opportunity to consolidate their understanding and revisit key ideas and supporting diagrams such as the bar model. Decimal multiplication can sometimes cause confusion, but using their knowledge of conversions and starting with 0.1 × ⋯ = ⋯ ÷ 10 and building from this is helpful.
Calculate fractions, decimals and percentages of an amount using calculator methods
Teachers model the use of calculators so students gain awareness of efficient methods and using estimation before calculating. When solving problems, students will have access to a calculator but may still need access to supporting tools, such as the bar model, to complement their understanding.
Convert between decimals and percentages greater than 100%
Students should already be fluent in converting between decimals and percentages up to 100% and now explore the equivalence of percentages above 100%. This will support later use of multipliers for percentage increase.
Percentage decrease with a multiplier
For percentage decrease, students will need to understand that they are subtracting the given percentage from 100%. This concept will be represented using bar models and number lines to help reinforce how to find the correct multiplier.
Calculate percentage increase and decrease using a multiplier
Students build on the last two steps using multipliers above one to increase an amount by a given percentage. Similarities and differences between percentage increase and decrease will be discussed and mixed questions will be given so that students are thinking carefully rather than just using a procedure.
Express one number as a fraction or a percentage of another without a calculator
As a first step on the way to expressing one number as a percentage of another, students will firstly explore writing one number as a fraction of another. In this step, the focus will be to support students to express fractions as percentages where the fraction denominators are factors or multiples of 100. Links will be made to probability and simple conversions.
Express one number as a fraction or a percentage of another using calculator
Building on from the previous step, students are asked to consider a number as a percentage of another both from fractions that can be converted mentally and those that are best converted using a calculator.
Work with percentage change
Students continue to express one number as a percentage of another, this time in the context of change. Good contexts to consider include percentage profit and loss and interest to remind students of these words. Students will look at situations that can be worked out using both calculator and non-calculator methods allowing them to choose the most appropriate method.
Choose appropriate methods to solve percentage problems
Skills gained from the previous lessons will be applied to various percentage problems. Students will analyse and discuss what questions are being asked and how to choose methods.
Find the original amount given the percentage less than 100% (H)
Bar models are a useful model as they show both the reduction and the remainder providing a strong visual clue as to how to find the original.
Find the original amount given the percentage greater than 100% (H)
Emphasis will be placed on adding the percentage increase to 100%. This will enable students to understand what percentage the value they are given represents.
Choose appropriate methods to solve complex percentage problems (H)
A variety of situations including the 'reverse' percentage questions just studied mixed with percentage increase, decrease, finding a percentage and expressing as a percentage.

Sequence of Lessons:

1	Convert fluently between key fractions, decimals and percentages
2	Calculate key fractions, decimals and percentages of an amount without a calculator
3	Calculate fractions, decimals and percentages of an amount using calculator methods
4	Convert between decimals and percentages greater than 100%
5	Percentage decrease with a multiplier
6	Calculate percentage increase and decrease using a multiplier
7	Express one number as a fraction or a percentage of another without a calculator
8	Express one number as a fraction or a percentage of another using calculator method
9	Work with percentage change
10	Choose appropriate methods to solve percentage problems
11	Find the original amount given the percentage less than 100% (H)
12	Find the original amount given the percentage greater than 100% (H)
13	Choose appropriate methods to solve complex percentage problems (H)

Topic Resources:

Knowledge Map:	Fractions Percentages FDP conversion

Assessment:

Knowledge:	End of Topic test
Application of Knowledge:	Termly mixed topic assessment

Supportive Reading:

Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
	Corbett Maths : www.corbettmaths.com
	AQA Revision Guide