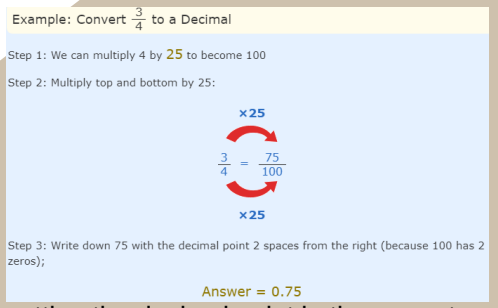
# TERM 2 OVERVIEW YEAR 6 – Maths

<table>
<tr><th colspan="3">Term 2 Book(s) – Goodnight Mr Tom</th></tr>
<tr><th colspan="2">Topic(s) – Block 2 Number: Percentages</th><th>Guide Time = 2 Weeks</th></tr>
<tr><td>Assessment:</td><td>WRMH End of block / term assessments<br>Weekly Arithmetic Tests / Skills checks<br>End of KS2 Statutory tests – year: 2018 and 2019.<br>Daily retention activities / quizzes to ensure children are revisiting prior learning.</td><td rowspan="3">Very Important Points (VIPs):<br><br>Percent = out of 100<br>Equivalent means the same value or amount.<br>Inverse: to perform the opposite operation - an operation that reverses the effect of another operation.<br><br>Converting between fractions, decimals and percentages:<br>Percent to decimal: ÷ 100 and remove the percentage sign<br>e.g. 75% = 0.75<br><br>Decimal to percentage: x 100 and add the percentage sign<br>e.g. 0.125 = 12.5%<br><br>Fraction to a decimal:<br>Divide the numerator by the denominator e.g. 2/5 = 2 ÷ 5 = 0.4<br>OR…<br>Step 1: Find a number you can multiply by the denominator to make it 10, or 100, or 1000.<br>Step 2: Multiply both the numerator and the denominator by that number.<br>Step 3. Then write down just the numerator, putting the decimal point in the correct spot (one space from the right-hand side for every zero in the bottom number).<br><br>  <br><br><br>Decimal to a fraction:</td></tr>
<tr><td>Links to prior learning (sequencing) and canon book</td><td><u>Canon Book – Goodnight Mr Tom</u><br>Children will have prior knowledge of recognising the percent symbol (%) and understand that percent relates to ‘number of parts per hundred’ and writing percentages as a fraction with denominator 100, and as a decimal.<br>Children will have prior knowledge of solving problems which require knowing percentage and decimal equivalents of ½ ¼ 1/5 2/5 4/5 and those fractions with a denominator of a multiple of 10 or 25.<br>Children will have prior knowledge of identifying, naming and writing equivalent fractions of a given fraction, represented visually, including tenths and hundredths.<br>Children will have prior knowledge of reading and writing decimal numbers as fractions [for example, 0.71 = 100 71].<br>Children will have prior knowledge of recognising and using thousandths and relating them to tenths, hundredths and decimal equivalents.</td></tr>
<tr><td>Links to other learning (cross fertilisation)</td><td><u>History</u> – children can apply their knowledge of percentages (fractions and decimal equivalences) when analysing the statistics of World War II e.g. percentages of allies compared to axis and how this changed over time in order for Britain to become succesful.<br>How has schooling of Maths, inparticular calculating perncentages, decimals and fractions changed in comparison</td></tr>
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from then and now? Children can explore the teaching of Maths during World War II and the 1940's and how this compares / differs / has changed to now.

Active Maths - provide additional maths questions / problems based around percentages and their link to decimal and fraction equivalence. Consolidate and teach further concepts in an active way, which allows children to apply their knowledge and understanding mentally at another time / lesson.

Geography – exploring the percentages of country involvement during World War II: children will explore the number / percentages of allies and axis' involved and how this changed throughout the war. Children will further examine and explore the percentages of distrubution of food and produce from other countries linked to rationing.

Thematic Questions:

The World Beyond Us: How would astronauts use their knowledge and understanding of percentages to support their space travel and time in space?

Would these methods apply to that of a pilot during World War II?

The World Around Us:

How large a proportion of British and American troops were involved in direct combat with the enemy in World War II? What was the casualty rate among those men? How does this compare to the percentage of women who played vital roles in the running of their country during this time?

Modern Britain:

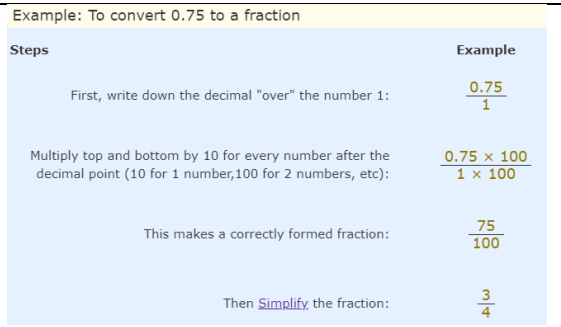
During the rationing of foods and goods, explore how knowledge of percentages would be important.

Healthy Bodies & Healthy Minds:

Why is it important to know the percentage daily intake of key food groups in order to stay healthy? For example, is it healthy to consume 50% of your daily recommendation in sugar every day?

Explore the percentage of each food group on a range of different food packaging: what does this tell you about how healthy this product is?

Would food percentages (and equivalence) differ now compared to those consumed during World War II?




**Fraction to a percentage:** divide the top number by the bottom number, then multiply the result by 100

**Percentage to a fraction:** first convert to a decimal (divide by 100), then use the steps for converting decimal to fractions (like above).

**Common equivalent fractions, decimals and percentages:**

| Percent | Decimal | Fraction |
|---|---|---|
| 1% | 0.01 | $^1/_{100}$ |
| 5% | 0.05 | $^1/_{20}$ |
| 10% | 0.1 | $^1/_{10}$ |
| 12½% | 0.125 | $^1/_8$ |
| 20% | 0.2 | $^1/_5$ |
| 25% | 0.25 | $^1/_4$ |
| $33^1/_3$% | 0.333... | $^1/_3$ |
| 50% | 0.5 | $^1/_2$ |
| 75% | 0.75 | $^3/_4$ |

**Finding the percentage of an amount:**
Multiply the percentage you are wanting to find by the amount / value / quantity and then divide by 100.
*E.g. 35% of 480: 480 x 25 = 12,000 ÷ 100 = 120*

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| | Culture:<br>How and why were percentages, fractions and decimal equivalence used, to ensure Britain had enough food, goods and products to survive and be successful at war?<br>Technology in Action:<br>How has technology changed since World War II to help and allow us to monitor the usage and impact it has had on key historical events and wars in Britain?<br>Would technology have been vital in supporting and calculating our percentages of usage / impact / foods / goods etc? | **Fat Questions:**<br>How do percentages exist and impact our daily lives?<br><br>Would Maths still be the same if percentages no longer existed?<br><br>Do you think World War II leaders would have had a good understanding of percentages (including fraction and decimal equivalence), which would support their governmental decisions and processes? |
| **Links to future learning** | The skills and knowledge taught in this block will be built upon and deepened throughout the year and continue to provide a secure platform for percentages, with links to decimal and fraction equivalaence.<br>Children will have a secure understanding of percentages and calculating with them, which they are able to apply to Year 7+ mathematical learning. | |
| **Character/Wider Development ('50 things', cultural capital, skills)** | Relate and use this knowledge and understanding in real-life contexts and make these relevant and purposeful links:<br>When shopping in a wide range of contexts, children can calculate a range of discounts from total prices.<br>When visiting a restaurant, children will be able to calculate the percentages of an amount when providing a service charge based on the total amount spent.<br>Communicate in a different language – Spanish: children will relate their mathematical understanding of percentages to calculate exchange rates between Euros and English pounds. They will also be able to investigate how these rates have changed overtime and why.<br>Visit the theatre / a castle – children can calculate percentage costings for their visits; they can explore the interest made and losses these kinds of venues may have had during the pandemic; explore the range of costings for running different trips like this.<br>Visit a person in their place of work: children could visit a bank / company where they are able to explore and find out more | |

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| | information regarding costings, budgets, potential wages, mortgage rates etc. that allows children to further explore and apply their understanding of percentages.<br>Make and sell a product- children will use and calculate the fraction or percentage of a budget they have to spend of each aspect of their product e.g. materials, presentation. They will calculate the percentage of their budget they have spent of each area of the product and what profit they need to make as a minimum. They will apply their understanding of fractions, decimals and percentages throughout the project; measuring and buying materials; calculating costs against their budget; profit margins.<br>Raise money for a charity- Children will be able to calculate the percentage of a fundraising target, which they wish to raise. They can analyse the percentage they have raised so far and how much more they need to achieve that target. They can also calculate the percentage of gift aid that people are able to donate. | |

# OVERVIEW OF TEACHING SEQUENCE

| Key Facts / Learning | Learning Focus or Key Question | Learning Outcomes (NC) | Key Words/ Vocabulary | Greater Depth/SEND | Misconceptions | Activities and Resources |
|---|---|---|---|---|---|---|
| Week 1 - 2<br><br>Number: Percentages | To convert fractions to percentages.<br><br>To find equivalent fractions, decimals and percentages.<br><br>To order fractions, decimals and percentages.<br><br>To find a percentage of an amount. (x2)<br><br>Part-whole models<br>Bar models<br>Number lines<br>Missing number questions / problems<br><br>A range of models / | Solving problems involving the calculation of percentages *[for example, of measures and such as 15% of 360]* and the use of percentages for comparison.<br><br>Recalling and using equivalences between simple fractions, decimals and percentages including in different contexts. | part, equal parts fraction, proper / improper fraction, mixed number, numerator, denominator equivalent, reduced to, cancel, one whole, half, quarter, eighth third, sixth, ninth, twelfth, fifth, tenth, twentieth hundredth, thousandth simplest form, simplify, proportion, ratio, in every, for every, to every, as many as, decimal, decimal fraction, decimal point, decimal place, percentage, percent, %, integer | GD: Children are introduced to more complex and wider reasoning and problem-solving questions / concepts. They will begin on this in order to<br><br>Children will have multi-step reasoning problems to solve, applying prior learning as well as current.<br><br>Children will need to use depth of mathematical knowledge to provide clear mathematical explanation and reasoning to problems.<br><br>SEND: Assessment and analysis of prior knowledge is needed. Teacher to assess and base planning and resources in a bespoke manner.<br><br>Children will focus on and use concrete and | If children do not master basic prior understanding of percentages taught earlier in the key stage, they will struggle with the understanding of percentages that are more complex and their application when calculating equivalence and finding percentages of amounts in their everyday lives. So even if you are teaching year 6, it is important to go back to 'basics' and children's prior learning to ensure they understand the essential knowledge.<br><br>Children lack an understanding of dividing by 100 and therefore struggle to convert fractions to percentages.<br><br>Children use their 'rationale' knowledge of number order and think that a 'large' number as a denominator is a larger value than a 'small' number e.g. 5/100 is larger than 5/10. | Pre-teaching of key concepts is vital to allow for children to commence tasks immediately within lessons and ensure prior learning is revisited and secure.<br><br>DTMs to be created using the following resources and based on CTs AFL of their class/cohort. Further cross-curricular links can and should be made to the 6 themes, for a wider context, which develops children's wider development / character.<br><br>WRMH: click here<br><br>Third Space Learning: https://thirdspacelearning.com/<br><br>Classroom Secrets: click here<br><br>NCETM – resources / activities for DTMs<br><br>Mastery_Assessment_Y6_High_Res.pdf<br><br>Maths Frame: click here<br><br>Slides / resources saved on trust shared. |

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| | contexts / problems will be used for children to develop their understanding of percentages: converting to their fraction and decimal equivalence as well as calculating and finding percentages of amounts. | | | pictorial resources to support and develop their understanding, E.g. the use of hundred squares and base ten will help children to understand percent as 'out of 100' and will enable them to physically see and compare the equivalence between fractions, decimals and percentages.<br><br>Use of real-life contexts should always be used to support all children's learning as they are able to see the relevance and purpose of this learning and apply it to an 'everyday' situation. | Children think that 0.10 is more than 0.2 because their schema tells them that 10 is more than 2.<br><br>Children simplify fractions by 2 only and therefore don't put the fraction into its simplified form as they can't find the highest common factor.<br><br>Children do not multiply by 100 when converting a decimal into a percentage, they assume numbers after the decimal point are percentage. E.g. 0.125 = 125%<br><br>Children become confused between the different rules for converting between fractions, decimals and percentages and use the wrong one.<br><br>Children do not convert each fraction, decimal or percentage to the same form before ordering.<br>Children will also order the converted forms instead of the original forms when answering the question.<br><br>Children think and see 0.1 as 1% without applying their knowledge of decimal place value to understand that 0.1 is equivalent to 10%. | |

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| | | | | | Children will divide by 1 when finding 1% of a number, instead of 100.<br><br>*AFL to be consistently used, to address misconceptions found within own classes / cohorts of children and address where applicable.* | |

Context (big picture learning):

Mathematics is an important, creative discipline that helps us to understand and change the world. We want all of our children within the Pontefract Academies Trust to experience all that mathematics has to offer and to develop a sense of curiosity about the subject with a clear understanding. When they leave us we want them to continue their love of maths and use it continuously and positively in their future lives.

We foster a positive 'growth mind-set' attitude and we promote the fact that we believe that all children can achieve in mathematics. We teach for secure and deep understanding of mathematical concepts through manageable, bespoke steps and cross fertilize at every opportunity. VIPs (Very Important Points) are implemented in every lesson to ensure knowledge and skills are revisited and retained over time.

We use mistakes and misconceptions as an essential part of learning and provide challenge through rich and sophisticated reasoning and problem solving activities. At our school, the majority of children will be taught the content from their year group only. They will spend time becoming true masters of content, applying and being creative with new knowledge in multiple ways.

Folder name and link to resources: Trust shared > Primaries > Departments > KS2 > Planning Cycle B > Spring 1: Goodnight Mr Tom > Maths > Year 6

Week 1 L1-4

Week 2 L5-8

# Year 6 Knowledge Organiser: Percentages

PONTEFRACT ACADEMIES TRUST

## Fat Questions:

How do percentages exist and impact our daily lives?

Would Maths still be the same if percentages no longer existed?

Do you think World War II leaders would have had a good understanding of percentages (including fraction and decimal equivalence), which would support their governmental decisions and processes?

## Key vocabulary

percentages
per cent = out of 100
equivalent fraction
equivalent decimal
compare
order
convert
the whole
decimal
decimal
tenths
hundredths
thousandths
fractions

*To see the full list of vocabulary, please refer to our resource walls.*

## Intent

We aim to develop and progress our skills in percentages and their links to decimals and fractions in order to equip us with the ability to solve real world problems that require a mathematical solution with multi-steps. With these skills, we can help to develop and improve the world around us, in which we live.

## VIPs:

**A decimal** is a number expressed in the scale of tens. Commonly speaking **we talk about decimals when numbers include a decimal point to represent a whole number plus a fraction of a whole number** (tenths, hundredths, etc.).

**Per cent** = out of 100

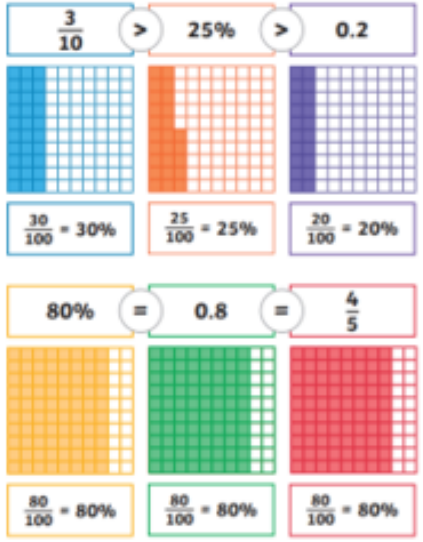
**Equivalent** means the same *value* or *amount*.

**Inverse:** to perform the opposite operation - an operation that reverses the effect of another operation.

### Finding a percentage of an amount:

| | | | |
|---|---|---|---|
| 50% = $\frac{1}{2}$ so we can divide by 2 | 10% = $\frac{1}{10}$ so we can divide by 10 | 25% = $\frac{1}{4}$ so we can divide by 4 | 1% = $\frac{1}{100}$ so we can divide by 100 |

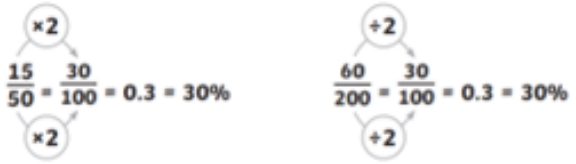
### Order fractions, decimals and percentages:




### Equivalent fraction, decimal and percentages:

| Percent | Decimal | Fraction |
|---|---|---|
| 1% | 0.01 | $^1/_{100}$ |
| 5% | 0.05 | $^1/_{20}$ |
| 10% | 0.1 | $^1/_{10}$ |
| 12½% | 0.125 | $^1/_8$ |
| 20% | 0.2 | $^1/_5$ |
| 25% | 0.25 | $^1/_4$ |
| 33⅓% | 0.333... | $^1/_3$ |
| 50% | 0.5 | $^1/_2$ |
| 75% | 0.75 | $^3/_4$ |

### Fractions to percentages:




### Percentages - Missing Values: