Year 7 Knowledge Organisers

Bishop walsh Catholic School

Spring Term 1

Place Value & FDP

Unit 7: Place Value

Unit 8: FDP Equivalence

Unit 9: Fractions & Percentages of Amounts

Place Value & FDP...

Unit 7: Place Value

What do I need to be able to do?

By the end of this unit you should be able to:

- Understand place value and the number system including decimals
- Understand and use place value for decimals, integers and measures of any size
- Order number and use a number line for positive and negative integers, fractions and decimals;
- use the symbols $=, \neq, \leq, \geq$
- Work with terminating decimals and their corresponding fractions
- Round numbers to an appropriate accuracy
- Describe, interpret and compare data distributions using the median and range

Keywords

Approximate: To estimate a number, amount or total often using rounding of numbers to make them easier to calculate with
Integer: a whole number that is positive or negative
Interval: between two points or values
Median: A measure of central tendency (middle, average) found by putting all the data values in order and finding the middle value of the list.
Negative: Any number less than zero; written with a minus sign.
Place holder: We use 0 as a place holder to show that there are none of a particular place in a number
Place value: The value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right
Range: The difference between the largest and smallest numbers in a set
Significant figure: A digit that gives meaning to a number. The most significant digit (figure) is the first non-zero digit.

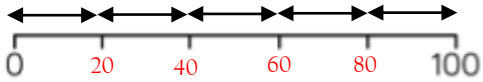
Integer Place Value

Billions			Millions			Thousands			Ones		
H	T	O	H	T	O	H	T	O	H	T	O
		3	1	4	8	0	3	3	0	2	9

Placeholder

Three billion, one hundred and forty eight million, thirty three thousand and twenty nine
1 billion 1, 000, 000, 000
1 million 1. 000, 000

Intervals on a number line



Divide the difference by the number of intervals (gaps)..
E..g. 100 ÷ 5 = 20

Rounding to the nearest power of ten

If the number is halfway between we "**round up**"

5495 to the nearest 1000: 5000 ⬆ 6000

5475 to the nearest 100: 5400 ⬆ 5500

5475 to the nearest 10: 5470 ⬆ 5480

Compare integers using <, >, =, ≠

< less than
> greater than
= equal to
≠ not equal to

Two and a half million = 2 500 000
300 000 000 = Three billion
Six thousand and eighty > 68 000

Range

Spread of the values

Difference between the biggest & smallest

3 9 8 12

Biggest value – Smallest value

12 – 3 = 9

Range = 9

Median

The middle value

Example 1
4 3 9 8 12

Median: put them in order 3 4 8 9 12
find the middle number 3 4 **8** 9 12

Example 2
150 154 148
137 160 158

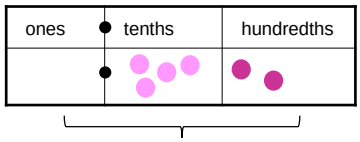
Median: put them in order
137 148 150 154 158 160

There are 2 middle numbers
Find the midpoint
152

Decimals

We say **"nought point five two"**

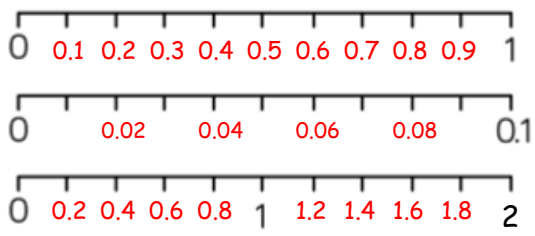
Five tenths and two hundredths



0 ones, 5 tenth and 2 hundredths
0 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.01 + 0.01
= 0 + 0.5 + 0.02
= **0.52**

Decimal intervals on a number line

One whole spit into 10 parts makes tenths = 0.1
One tenth split into 10 parts makes hundredths = 0.01

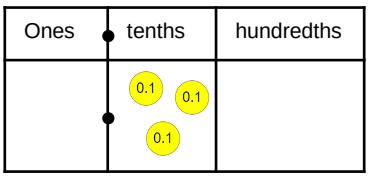


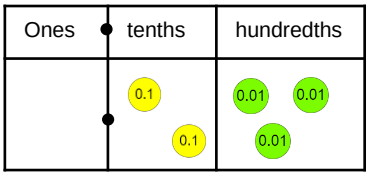
Comparing decimals

Which the largest of 0.3 and 0.23?

$0.3 > 0.23$

"There are more counters in the furthest column to the left"





0.30
0.23

Comparing the values both with the same number of decimal places is another way to compare the number of tenths and hundredths

Round to 1 significant figure

370 to 1 significant figure is 400
37 to 1 significant figure is 40
3.7 to 1 significant figure is 4
0.37 to 1 significant figure is 0.4
0.00000037 to 1 significant figure is 0.0000004

Round to the first non zero number

Place Value & FDP...

Unit 8: FDP Equivalence

What do I need to be able to do?

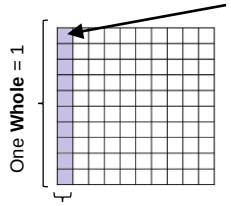
By the end of this unit you should be able to:

- .Convert fluently between fractions, decimals & percentages

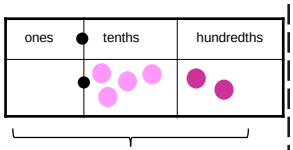
Keywords

Fraction: how many parts of a whole we have
Decimal: a number with a decimal point used to separate ones, tenths, hundredths etc.
Percentage: a proportion of a whole represented as a number between 0 and 100
Place value: the numerical value that a digit has decided by its position in the number
Placeholder: a number that occupies a position to give value
Interval: a range between two numbers
Tenth: one whole split into 10 equal parts
Hundredth: one whole split into 100 equal parts
Sector: a part of a circle between two radius (often referred to as looking like a piece of pie)
Recurring: a decimal that repeats in a given pattern

Tenths and hundredths



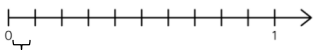
One **hundredth** (one whole split into 100 equal parts) = $\frac{1}{100}$ = 0.01



0 ones, 5 tenths and 2 hundredths
0 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.01 + 0.01
= 0 + 0.5 + 0.02
= 0.52

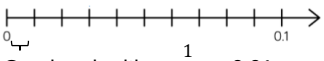
One **tenth** (one whole split into 10 equal parts) = $\frac{1}{10}$ = 0.1

On a number line



One whole – split into 10 equal parts

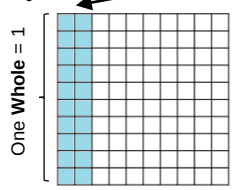
One tenth = $\frac{1}{10}$ = 0.1



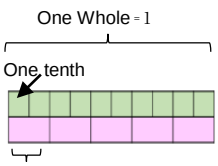
One tenth – split into 10 equal parts

One hundredth = $\frac{1}{100}$ = 0.01

Fifths



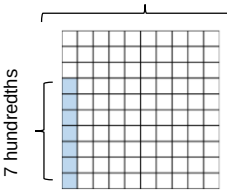
Twenty hundredths



One **fifth** (one whole split into 5 equal parts) = $\frac{1}{5}$ = 0.2

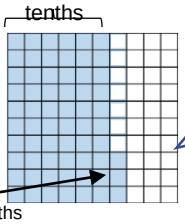
Percentages on a hundred grid

100% = a whole = 100 hundredths



7 hundredths
7 out of 100
7%

6 tenths

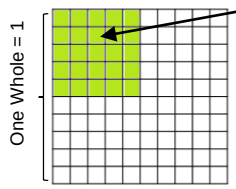


6 tenths and
3 hundredths
63 hundredths
63%

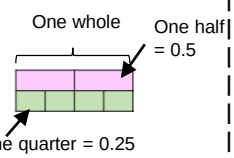
3 hundredths

Quarters

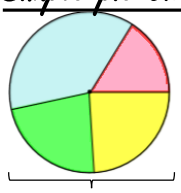
One quarter (one whole split into 4 equal parts) = $\frac{1}{4}$ = 0.25



Twenty five hundredths



Simple pie charts



Split into 10 parts
= 10% = 36º

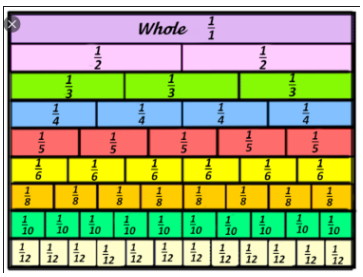
Split into 2 parts
= 50% = 180º

Split into 5 parts
= 20% = 72º

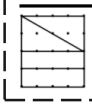
A pie chart has 360º so all FDP calculations are out of 360

Equivalent fractions

Represent equivalence with fraction walls

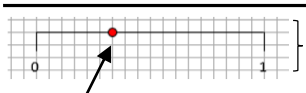


Fractions – on a diagram



The denominator is represented by EQUALLY sized parts – this is split into quarters

Fractions – on a number line



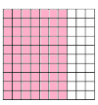
One whole split into 18 equal parts
18 is the denominator

This point is at the 6th part
6 is the numerator

$\frac{6}{18} \rightarrow \frac{3}{9} \rightarrow \frac{1}{3}$

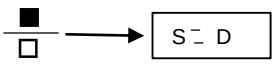
Convert FDP

$\frac{70}{100}$ → This also means 70 ÷ 100 → 70 out of 100 squares
70 "hundredths"
= 7 "tenths"
0.7



→ 70 hundredths = 70%

Using a calculator



Convert to a decimal

This will give you the answer in the simplest form

× 100 converts to a percentage

Be careful of recurring decimals
e.g $\frac{1}{3}$ = 0.3333333
= $0.\dot{3}$
The dot above the 3

Place Value & FDP...

Unit 9: Fractions and Percentages of Amounts

What do I need to be able to do?

By the end of this unit you should be able to:

- Find a fraction of a given amount
- Use a given fraction to find the whole or other fractions
- Find the percentage of an amount using mental methods
- Find the percentage of a given amount using a calculator

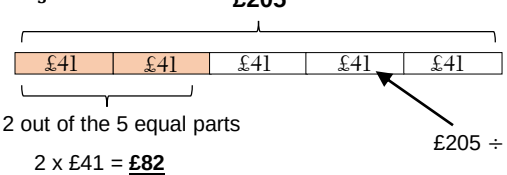
Keywords

Fraction: how many parts of a whole we have
Equivalent: of equal value
Whole: a number with no fractional or decimal part.
Percentage: parts per 100 (uses the % symbol)
Place Value: the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right
Convert: change into an equivalent representation, often fraction to decimal to a percentage cycle.

Fraction of a given amount

Find $\frac{2}{5}$ of £205

The bar represents the whole amount

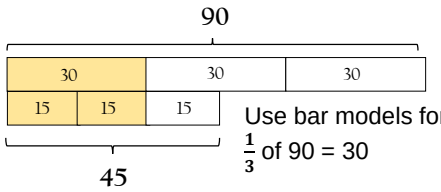


2 out of the 5 equal parts

2 x £41 = **£82**

£205 ÷ 5 = £41

Each part of the bar model represents £41.



Use bar models for comparisons

$\frac{1}{3}$ of 90 = 30

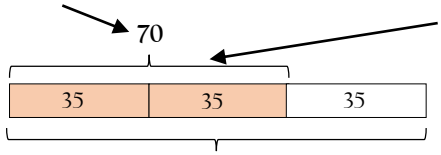
$\frac{2}{3}$ of 45 = 30

$\therefore \frac{1}{3}$ of 90 = $\frac{2}{3}$ of 45

Use a fraction of amount

The wording of the question is important to setting up the bar model

$\frac{2}{3}$ of a value is 70. What is the whole number?



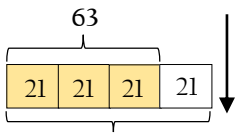
70 ÷ 2 = 35

Each part of the bar model represents 35.

35 x 3 = **105**

The whole number is 105

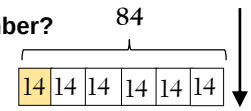
$\frac{3}{4}$ of a number is 63.



Find the whole

What is $\frac{1}{6}$ of the number?

14

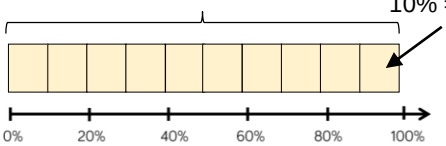


Use the whole to find a given part

Find the percentage of an amount (Mental methods)

The **whole** represents 100%

10% = $\frac{1}{10}$ of the whole



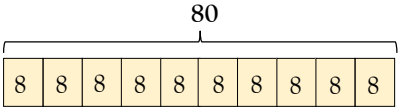
10% = $\frac{1}{10}$ of the whole

50% = $\frac{5}{10}$ = $\frac{1}{2}$ of the whole

20% = $\frac{2}{10}$ = $\frac{1}{5}$ of the whole

5% = $\frac{1}{20}$ of the whole

Find 65% of 80



For bigger percentages it is sometimes easier to take away from 100%

Method 1:
65% = 10% x 6 + 5%
= (8 x 6) + 4
= 52

Method 2:
65% = 50% + 10% + 5%
= 40 + 8 + 4
= 52

Find the percentage of an amount (Calculator methods)

Using a multiplier

Find 65% of 80

Fraction, decimal, percentage conversion

65% = $\frac{65}{100}$ = 0.65

The multiplier

0.65 x 80 = **52**

Using the percent button

Find 65% of 80

This brings up the % button on screen You will see 65%

Type **65**

Press SHIFT ((%)

Press × **80** and then press =

You can also use the calculator to support non calculator methods and find 1% or 10% then add percentages together

"of" can represent 'x' in calculator methods