



YEAR 7
KNOWLEDGE ORGANISERS



BLOCK: PLACE VALUE AND PROPORTION

Place value & ordering integers & decimals

Fraction, decimal & percentage equivalence

"MATHS OPENS DOORS"

YEAR 7 — PLACE VALUE AND PROPORTION

Ordering integers and decimals

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:** any positive or negative whole number, or zero
- 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) in an integer is the digit on the left. The most significant digit in a decimal fraction is the first non-zero digit after the decimal point

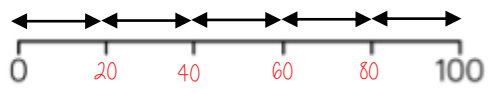
Integer Place Value

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 | 000, 000, 000
 1 million | 000, 000

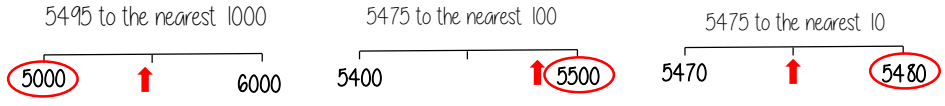
Intervals on a number line



Divide the difference by the number of intervals (gaps).
 Eg $100 \div 5 = 20$

Rounding to the nearest power of ten

If the number is halfway between we "round up"



Compare integers using $<$, $>$, $=$, \neq

- $<$ less than: Two and a half million (2 500 000)
- $>$ greater than: 300 000 000 (Three billion)
- $=$ equal to: 300 000 000
- \neq not equal to: Six thousand and eighty (68 000)

Range Spread of the values

Difference between the biggest and smallest
 3 9 8 12
 Range: Biggest value - Smallest value
 $12 - 3 = 9$
 Range = 9

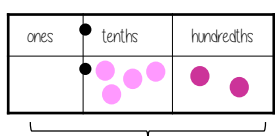
Median The middle value

Example 1: Median: put the in order 3 4 8 9 12
 4 3 9 8 12 find the middle number 3 4 **8** 9 12

Example 2: Median: put the in order 150 154 148 137 148 **150 154** 158 160
 137 160 158 There are 2 middle numbers Find the midpoint 152

Decimals

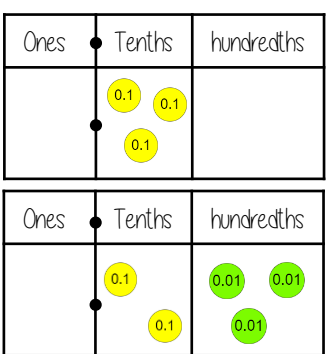
We say "nought point five two"
 Five tenths and two hundredths



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

Comparing decimals

Which the largest of 0.3 and 0.23?

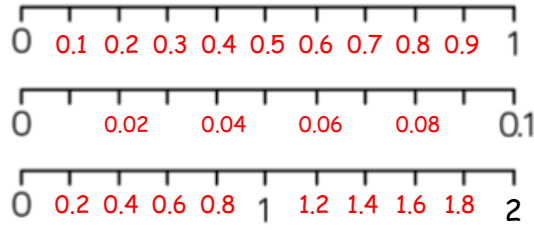


$0.3 > 0.23$
 "There are more counters in the furthest column to the left"

0.30 } Comparing the values both with the same number of decimal places is another way to compare the number of tenths and hundredths
 0.23 }

Decimal intervals on a number line

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



Round to 1 significant figure

- 370 to 1 significant figure is 400
- 37 to 1 significant figure is 40
- 37 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

YEAR 7 — PLACE VALUE AND PROPORTION... 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

Decimal (number): a number that uses a decimal point followed by digits that show a value smaller than one

Fraction: any part or a group, number or whole

Hundredth: one part in one hundred equal parts

Interval: between two points or values

Percentage: a fraction expressed as a number out of 100. Uses the % symbol

Place holder: we use 0 as a place holder to show that there are none of a particular place in a number.

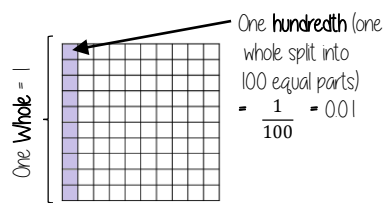
Place value: the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right.

Recurring (decimal): a decimal number that has a repeating digit or pattern of repeating digits

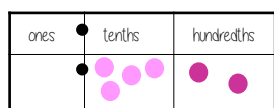
Sector: a "pie-slice" part of a circle, bounded by two radii and an arc.

Tenth: one part in ten equal parts of a whole.

Tenths and hundredths



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



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

On a number line

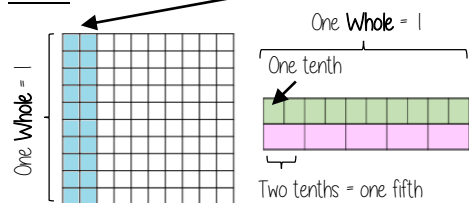
One whole — split into 10 equal parts

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

One tenth — split into 10 equal parts

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

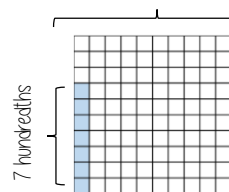
Fifths



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

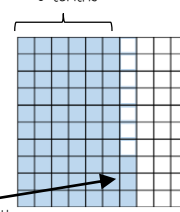
Percentages on a hundred grid

100% = a whole = 100 hundredths



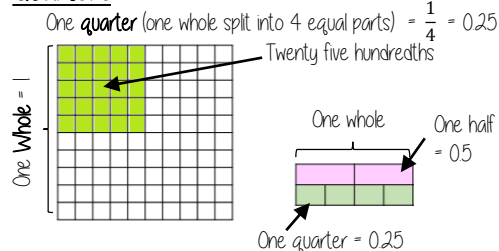
7 hundredths
7 out of 100
7%

6 tenths

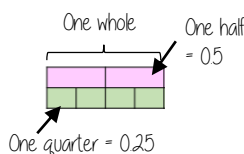


6 tenths and 3 hundredths
63 hundredths
63%

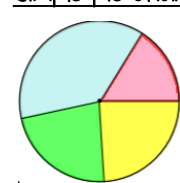
Quarters



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



Simple pie charts



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

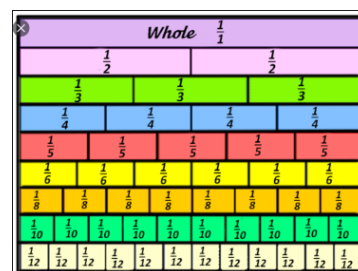
Split into 10 parts
= 10% = 36°

Split into 2 parts
= 50% = 180°

Split into 5 parts
= 20% = 72°

Equivalent fractions

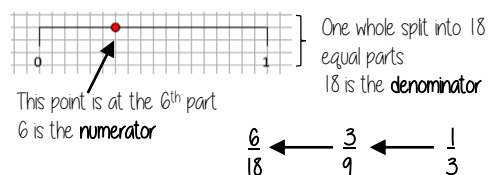
Represent equivalence with fraction walls



Fractions — on a diagram

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

Fractions — on a number line



Convert FDP

$\frac{70}{100}$

This also means 70 out of 100 squares
70 "hundredths" = 70%



70 hundredths = 70%

Using a calculator

$\frac{70}{100}$

S=D 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. $\frac{1}{3} = 0.3333333$
 $\frac{1}{3} = 0.\dot{3}$
 The dot above the 3