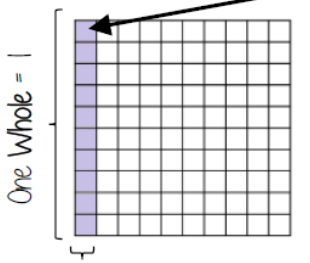
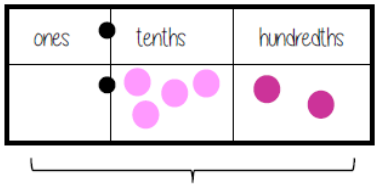
Knowledge Organiser: Year 7 Maths; Structure of number – Place Value (Part 1)

Tenths and hundredths



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

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



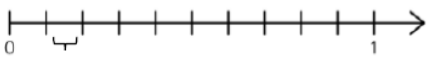
0 ones, 5 tenth and 2 hundredths

0 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.01 + 0.01

= 0 + 0.5 + 0.02

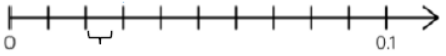
= 0.52

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

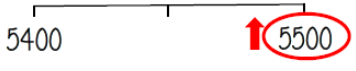
One hundredth = $\frac{1}{100}$ = 0.01

Round to powers of 10

If the number is halfway between we "round up"

5495 to the nearest 1000

5475 to the nearest 100



5475 to the nearest 10

Round to decimal places

2.46192 ← Focus on the numbers **after** the decimal point

"To 1dp" – to one number after the decimal

"To 2dp" – to two numbers after the decimal

2.46192 (to 1dp) - Is this closer to 24 or 25

2.4 6192 This shows the number is closer to 25

2.46192 (to 2dp) - Is this closer to 246 or 247

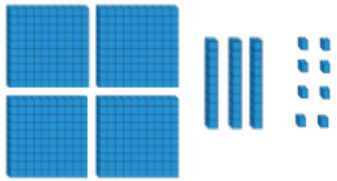
2.46 192 This shows the number is closer to 246

Addition/ Subtraction with decimals

4	.	3	8	
7	.	9	0	+

0 can be used to fill empty places with value

The decimal place acts as the placeholder and aligns the other values



If  represents 1 instead of 100

$5.43 + \frac{8}{10}$

Revisit Fraction – Decimal equivalence

5.43 + 0.8

Keywords

Significant: Place value of importance

Round: Making a number simpler but keeping its value close to what it was

Decimal: Place holders after the decimal point

Commutative: changing the order of the operations does not change the result

Associative: when you add or multiply you can do so regardless of how the numbers are grouped

Inverse: the operation that undoes what was done by the previous operation (The opposite operation)

Placeholder: a number that occupies a position to give value

Tenth: one whole split into 10 equal parts

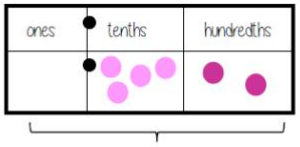
Hundredth: one whole split into 100 equal parts

Knowledge Organiser: Year 7 Maths; Structure of number – Place Value (Part 2)

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?

Ones	Tenths	hundredths
	0.1, 0.1, 0.1	

Ones	Tenths	hundredths
	0.1, 0.1	0.01, 0.01, 0.01

$0.3 > 0.23$

"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

Mental methods for decimals

Multiplying by a decimal < 1 will make the original value smaller e.g x 0.1 = ÷ 10

Methods for multiplication 1.2 x 0.03

$12 \times 3 = 36$
$1.2 \times 3 = 3.6$
$1.2 \times 0.3 = 0.36$
$1.2 \times 0.03 = 0.036$

$12 \times 3 = 36$
÷ 10 ÷ 100 ÷ 1000
$1.2 \times 0.03 = 0.036$

Methods for division 1.5 ÷ 0.05

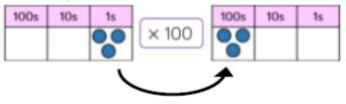
Multiply by powers of 10 until the divisor becomes an integer

$1.5 \div 0.05$
x100 x100
$150 \div 5 = 30$

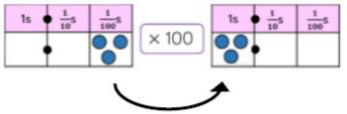
Methods for addition 2.3+2.4

$2 + 2 = 4$
$0.3 + 0.4 = 0.7$
$4 + 0.7 = 4.7$

Multiply/ Divide by powers of 10



3 x 100 = 300



0.03 x 100 = 3

Repeated multiplication and division by powers of 10 is commutative

÷ 10 then ÷ 10 → ÷ 100

Addition/ Subtraction with decimals

The method's just the same, but start instead by lining up the decimal points.

EXAMPLES:

1. Work out 0.7 + 32.2 + 1.65.

1) 0.70
32.20
+ 1.65
.55
1

Decimal points lined up

It often helps to write in extra zeros to make all the decimals the same length

7 + 2 + 6 = 15 — write 5 and carry the 1

2) 0.70
32.20
+ 1.65
34.55
1

0 + 2 + 1 + carried 1 = 4

2. Ryuji has £5 and spends 91p on a pie. How much does he have left?

1) £5.00
− £0.91

Decimal points lined up

0 is smaller than 1, so you can't do 0 – 1.

2) 4 10
£5.00
− £0.91

Borrow 10...

3) 9
4 10 10
£5.00
− £0.91
£4.09

...then borrow 10 again

10 – 1 = 9

9 – 9 = 0

4 – 0 = 4

Ordering Decimals

1) Do the whole number bit first, then the bit after the decimal point.
2) With numbers between 0 and 1, first group them by the number of 0s at the start. The group with the most 0s at the start comes first.

EXAMPLE: Write these numbers in order, from smallest to largest:

11.9 13.56 7.143 11.6 7.7 2.6 8.91

1) First order them by the whole number bit from smallest to largest.

2.6 7.143 7.7 8.91 11.9 11.6 13.56

2) If two numbers have the same whole number bit, then order them by the size of the decimal.

2.6 7.143 7.7 8.91 11.6 11.9 13.56

In decimals, like in whole numbers, the value of the digits decreases from left to right.

0.256
tenths hundredths thousandths

EXAMPLE: Write these numbers in order, from smallest to largest:

0.1 0.022 0.53 0.0011 0.027 0.023 0.0023

1) These are all between 0 and 1, so group them by the number of 0s at the start:

2 initial 0s		1 initial 0			no initial 0s	
0.0011	0.0023	0.022	0.027	0.023	0.1	0.53

2) Once they're in groups, just order them by comparing the first non-zero digits.
(If the first non-zero digits are the same, look at the next digit along instead.)

0.0011 0.0023 0.022 0.023 0.027 0.1 0.53

How do we use Knowledge Organisers in Mathematics?

How can you use knowledge organisers at home to help us?

- **Retrieval Practice:** Read over a section of the knowledge organiser, cover it up and then write down everything you can remember. Repeat until you remember everything.
- **Flash Cards:** Using the Knowledge Organisers to help on one side of a piece of paper write a question, on the other side write an answer. Ask someone to test you by asking a question and seeing if you know the answer.
- **Mind Maps:** Turn the information from the knowledge organiser into a mind map. Then reread the mind map and on a piece of paper half the size try and recreate the key phrases of the mind map from memory.
- **Sketch it:** Draw an image to represent each fact; this can be done in isolation or as part of the mind map/flash card.
- **Teach it:** Teach someone the information on your knowledge organiser, let them ask you questions and see if you know the answers.

How will we use knowledge organisers in Mathematics?

Knowledge organisers will be used before I complete a Learning Check or Common Assessment. I will spend part of the lesson looking over each of the key topics of the half term before completing the Learning Check or Common Assessment.
I will also use these at home to complete my own independent learning and revision of these key topics.

GLUE HERE