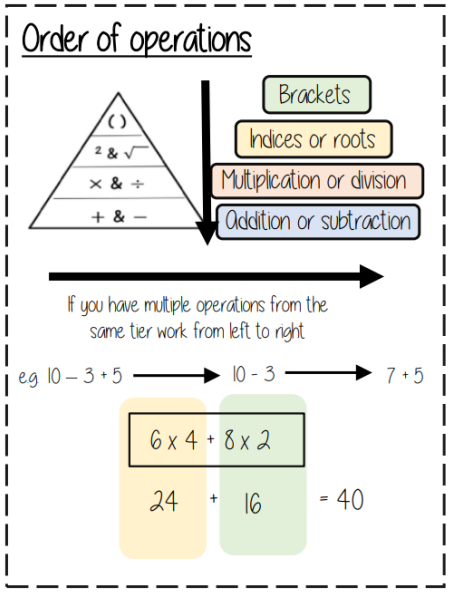
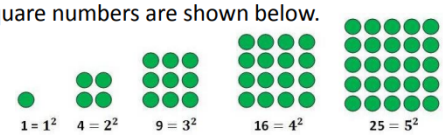
Highsted Knowledge Organiser
Maths
Year 7 BIDMAS

What I need to know	Key Vocabulary
• Recognise square and cube numbers • Understand index notation for square and cube numbers. • Find square roots and cube roots of numbers. • Use a calculator to find powers and roots • Understand the order of operations: BIDMAS (include the 4 4's problem). • Use a calculator and interpret the answer sensibly. • Use brackets on a calculator	Brackets, indices, operations, multiplication, division, addition, subtraction, index notation, square, cube, roots, square root, cube root

Student reference point



Square numbers: This is when we multiply a number by itself, the first 5 square numbers are shown below.

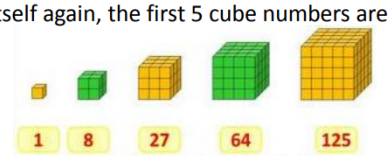


Square roots: This is the number that we started with to get the square numbers.

$\sqrt{49}$ = 7 because 7x7 is 49 ← Remember the answer is 7 not 7x7.

$\sqrt{100}$ = 10 because 10x10 is 10

Cube numbers: This is when we multiply a number by itself and then by itself again, the first 5 cube numbers are shown below.



Challenge question

Every Maundy Thursday, the reigning monarch distributes 'Maundy money' to equal numbers of men and women.

One year at Newcastle 64 men and 64 women each received 64p, one penny for each year of the Queen's life.

Written as a power of 2, what was the total amount distributed in pence?

Suggested reading

https://youtu.be/63qQOYbZS0g (Corbettmaths Square Numbers)
https://youtu.be/oSfs9mGO_lU (Corbettmaths Square Root)
https://youtu.be/YgxUCo94-xk (Corbettmaths Cube Numbers)
https://youtu.be/2Xn_mYEoct4 (Corbettmaths Cube roots)
https://youtu.be/if8ZsZXhQJE (Corbettmaths Order of Operations)

Highsted Knowledge Organiser
Maths
Year 7 Factors, Primes and Multiples

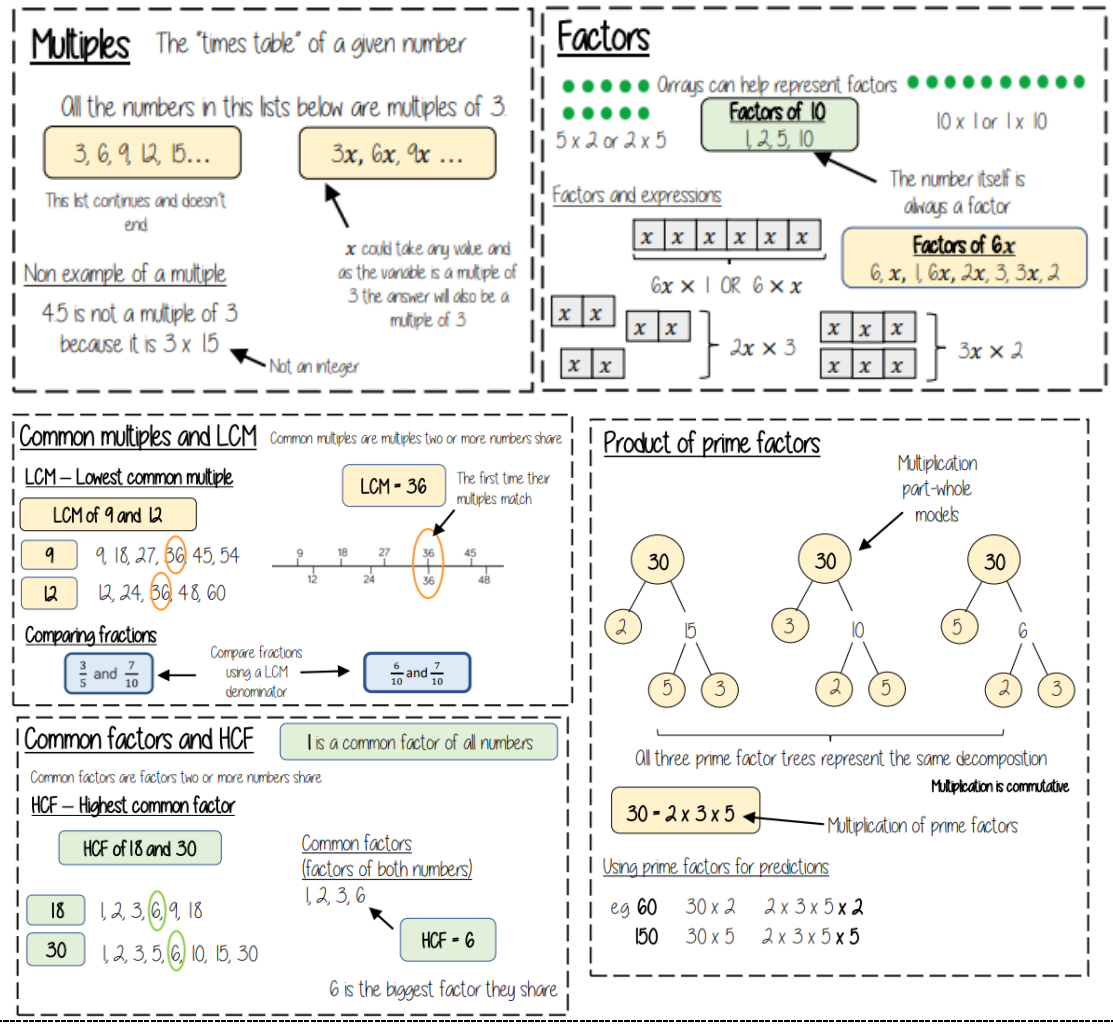
What I need to know

- Understand divisibility facts.
- Find factors and multiples of numbers
- Know which numbers are prime numbers.
- Write numbers as the product of prime numbers using index notation.
- Use Venn diagrams to find the HCF and LCM of a pair of numbers

Key Vocabulary

Divisibility, factors, multiples, prime numbers, product, index notation, venn diagram, highest common factor, lowest common multiple

Student reference point



Challenge question

The integer 113 is prime, and its reverse, 311, is also prime.
How many two-digit primes are there between 10 and 99 which have the same property?

Suggested reading

https://youtu.be/YkbMTSqE1vM (Corbettmaths Factors)
https://youtu.be/gASAc6_kBL4 (Corbettmaths Highest Common Factor)
https://youtu.be/xHWUJkNQRdI (Corbettmaths Multiples)
https://youtu.be/DW_yEg6VGac (Corbettmaths Lowest Common Multiples)

Highsted Knowledge Organiser
Maths
Year 7 Number Skills and Directed Numbers

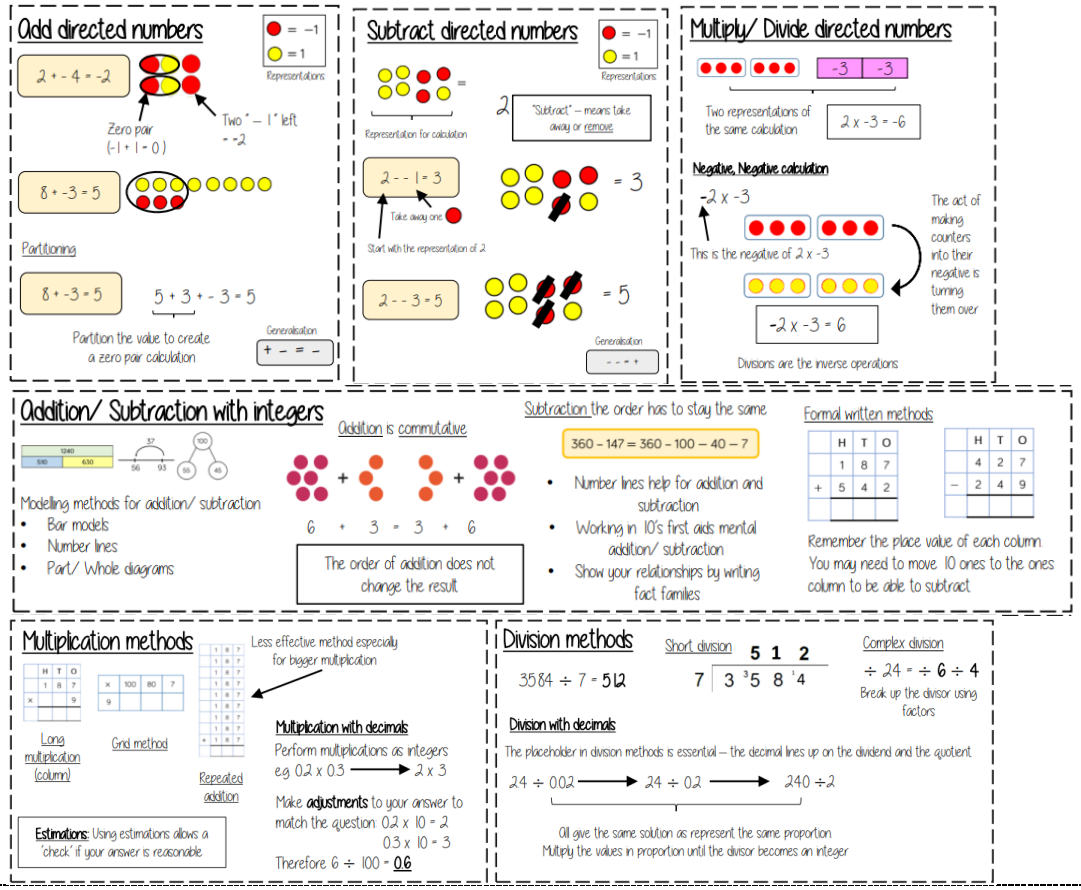
What I need to know

- Understand and use decimal notation and place value and order decimals
- Multiply and divide integers and decimals by 10, 100, 1000 and explain the effect.
- Understand negative numbers as positions on the number line.
- Order, add and subtract positive and negative integers in context
- Multiply and divide negative numbers
- Multiply and divide three-digit numbers by two-digit numbers
- Divide numbers using written methods
- Solve number problems
- Round numbers to different degree of accuracy
- Estimate the answers to calculations.

Key Vocabulary

Decimal, place value, order, multiply, divide, integer, negative numbers, add, subtract, three-digit numbers, two-digit numbers, degree of accuracy, estimate

Student reference point



Challenge question

I have some strange dice: the faces show the numbers 1 to 6 as usual, except that the odd numbers are negative (i.e. -1, -3, -5 in place of 1, 3, 5).
If I throw two such dice, which of the following totals cannot be achieved?
a) 3 b) 7 c) 8

Suggested reading

https://youtu.be/wayoCIgl08I (Corbettmaths Long Multiplication)
https://youtu.be/mED76j4Agiw (Corbettmaths Negative numbers addition and subtraction)
https://youtu.be/ElAvJfpGD0w (Corbettmaths Multiplying negatives)
https://youtu.be/0KbzamTIJCQ (Corbettmaths Dividing negatives)
https://youtu.be/l00tsmfk8oQ (Corbettmaths Estimating)

Highsted Knowledge Organiser
Maths
Year 7 Expressions

What I need to know

- Understand that algebraic operations follow the same conventions as arithmetic operations
- Simplify expressions by collecting like terms and cancelling fractions
- Multiply out brackets

Key Vocabulary

Operations, algebraic, arithmetic, collecting like terms, fractions, brackets

Student reference point

Form expressions

For unknown variables, a letter is normally used in its place

More than – ADD

Less than/ difference – SUBTRACT

e.g. 4 more than t → t + 4

8 less than k → k - 8

Only similar terms can be grouped together

e.g. Find the perimeter of this shape

(Perimeter = length around outside of shape)

t + 2t + 1 + t + 2t + 1 → 6t + 2

Directed numbers

+ + → +

– – → +

+ – → –

– + → –

e.g. a = -5 and b = 2

a^2 = a x a = -5 x – 5 = 25

b + a = 2 + - 5 = -3

Like and unlike terms

Like terms are those whose variables are he same

♡ and 3♡ are **like** terms

the variable is the same

☆ 3♡ are **unlike** terms

the variables are NOT the same

Examples and non-examples

Like terms	Un-like terms
y, 7y	y, 7x
$2x^2$, x^2	$2x^2$, $2c^2$
ab, 10ba	ab, 10a
5, -2	5, -2t

Note here ab and ba are commutative operations, so are still like terms

Collecting like terms ≡ symbol

The ≡ symbol means equivalent to

It is used to identify equivalent expressions

Collecting like terms

Only **like terms** can be combined

4x +5b –2x +10b

4x +5b –2x +10b

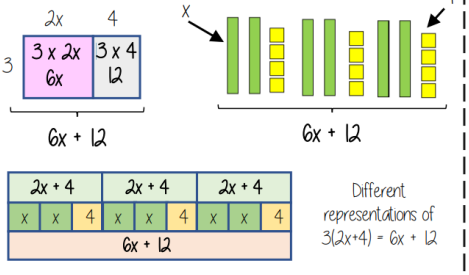
2x + 15b

Common misconceptions

$2x + 3x^2 + 4x \equiv 6x + 3x^2$

Although they both have the x variable x2 and x terms are un-like terms so can not be collected

Multiply single brackets 3 (2x + 4)



Challenge question

In the set of equations below, how many △s are equal to ◊?

△ + △ = □

□ + △ = ○

◊ = ○ + □ + △

Suggested reading

https://youtu.be/gn91zRbHRrc (Corbettmaths Forming Algebraic Expressions)

https://youtu.be/zxJNJMDj2Ec (Corbettmaths Collecting Like Terms)

https://youtu.be/ZJA1qz4XovY (Corbettmaths Expanding Brackets)

Highsted Knowledge Organiser
Maths
Year 7 Fractions

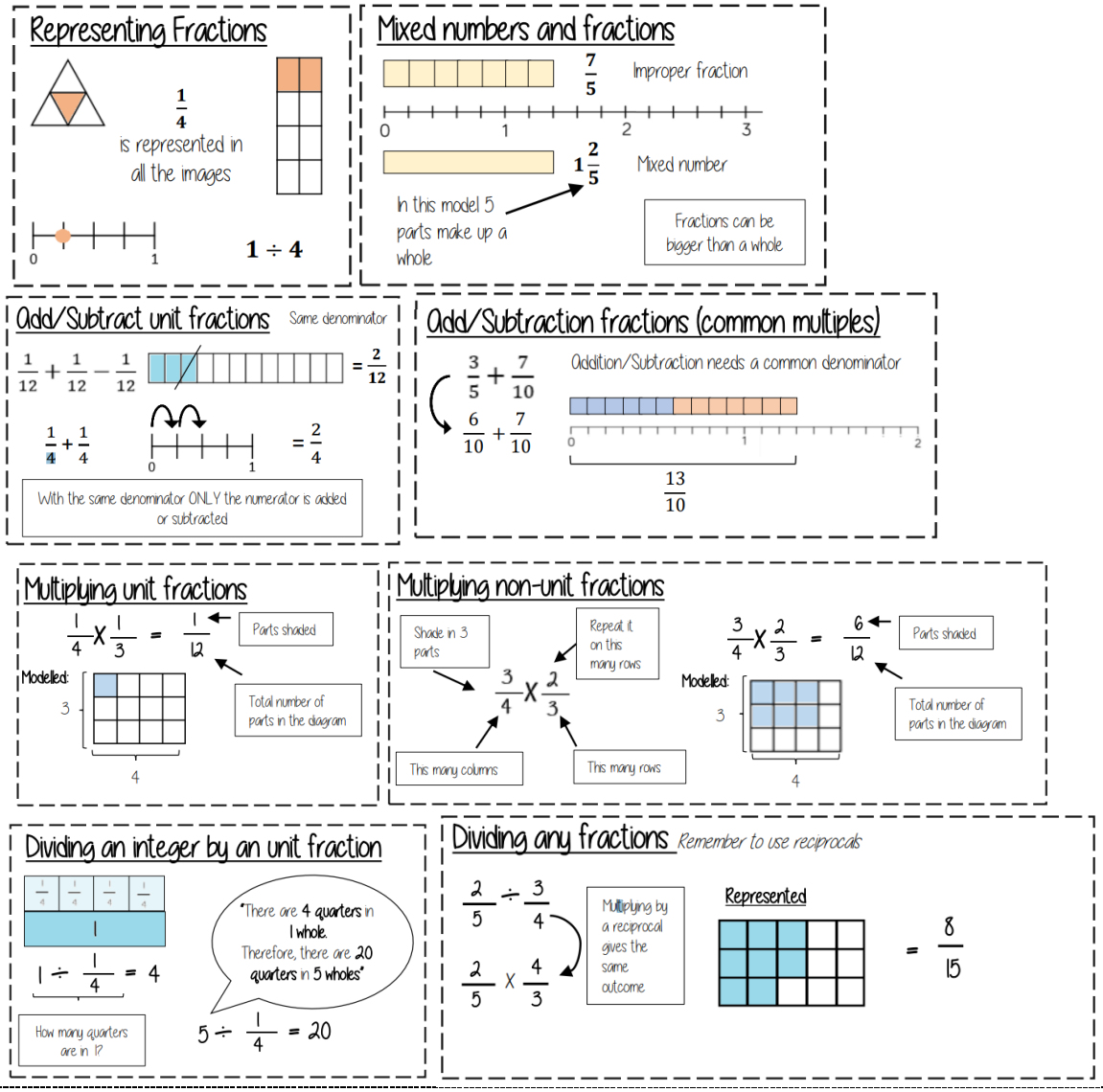
What I need to know

- Understand the meaning of fractions as parts of a whole
- Recognise equivalent fractions, and simplify fractions, including changing between improper fractions & mixed numbers
- Compare sizes of fractions
- Add and subtract fractions (no mixed numbers)
- Multiply and Divide Fractions

Key Vocabulary

Part, whole, equivalent, simplify, improper fraction, mixed numbers, compare, add, subtract, multiply, divide

Student reference point



Challenge question

Yesterday, Granny had 12 cups and 10 matching saucers, but this morning she dropped a tray holding one third of the cups and half the saucers, breaking all of those on the tray.
How many of her cups are now without saucers?

Suggested reading

https://youtu.be/tlKN8NNNxdI (Corbettmaths Simplifying Fractions)
https://youtu.be/w3JewxYjiNs (Corbettmaths Adding Fractions)
https://youtu.be/93Y8hCoOAj0 (Corbettmaths Multiplying Fractions)
https://youtu.be/c89f9IewdkI (Corbettmaths Division Fractions)

Highsted Knowledge Organiser
Maths
Year 7 Expressions

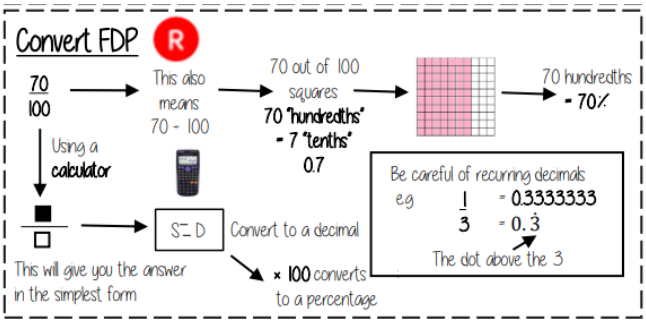
What I need to know

- Interchange fractions, decimals and percentages with and without a calculator and recognise simple ones.
- Find a percentages and fractions of a quantity using mental and calculator methods
- Find simple percentage increases and decreases (only 10%, 25%, 50% etc…)

Key Vocabulary

Fraction, decimal, percentage, quantity, increase, decrease

Student reference point



To increase by a percentage we use multipliers.

To find the multiplier we divide the percentage by 100 and add it to 1.

Increase 30 by 16%

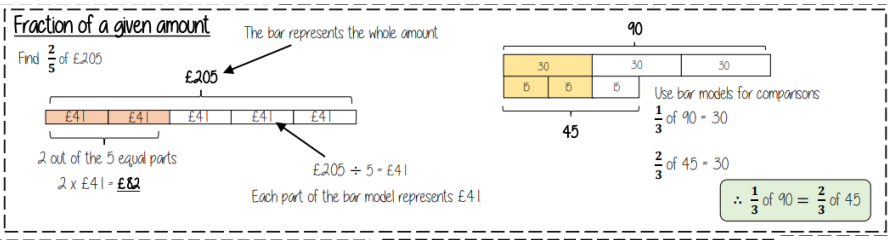
30 x 1.6 = 34.8

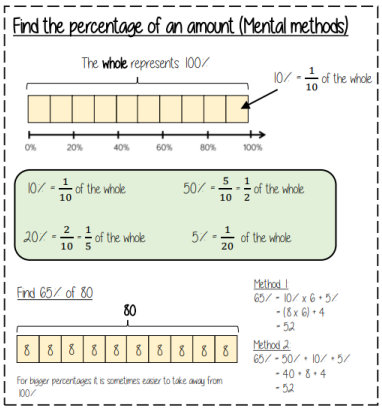
To decrease by a percentage we use multipliers.

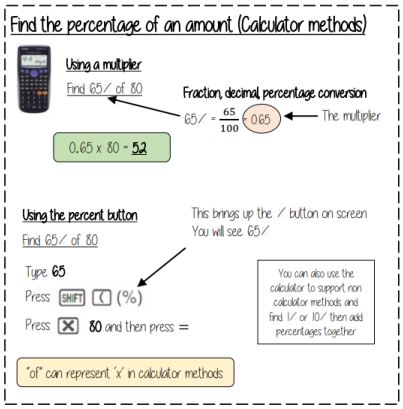
To find the multiplier we divide the percentage by 100 and subtract it from 1

Decrease 70 by 19%

70 x 0.81 = 56.1







Challenge question

In Emily's first spelling test, she scored 1 mark out of 5, so she decided to work really hard to improve her scores.

If she scores full marks (5 out of 5) in all her tests after the first, how many more tests does she need to take, in order to increase her average to more than 80%?

Suggested reading

https://youtu.be/pmHwZ7WYRXE (Corbettmaths Percentages to Decimals)
https://youtu.be/Alod_I-STl8 (Corbettmaths Percentages to Fractions)
https://youtu.be/hO_ITi01VIk (Corbettmaths Decimals to Fractions)
https://youtu.be/tUtgC7ZrsRc (Corbettmaths Increasing and Decreasing)