What do I need to be able to do?

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

- Identify integers, real and rational numbers
- Work with directed number
- Solve problems with number
- Find HCF/ LCM
- Add/ Subtract fractions
- Multiply/ Divide fractions
- Write numbers in standard form

Keywords

Integer: a whole number that is positive or negative
Rational: a number that can be made by dividing two integers
Irrational: a number that cannot be made by dividing two integers
Inverse operation: the operation that reverses the action
Quotient: the result of a division
Product: the result of a multiplication.
Multiples: found by multiplying any number by positive integers
Factor: integers that multiply together to get another number

Integers, real and rational numbers

Rational – root word: *ratio*

Real numbers: $\frac{2}{3}$ stems from 2:1 ($\frac{2}{3}$ of the whole)

Irrational numbers: $\sqrt{2}$ the solution is a decimal that never ends and does not repeat.

The square root of a negative is not a real number and cannot be found.

HCF/LCM R

1 is a common factor of all numbers

Common factors are factors two or more numbers share

HCF – Highest common factor

HCF of 18 and 30

| 18 | 1, 2, 3, (6), 9, 18 |
| 30 | 1, 2, 3, 5, (6), 10, 15, 30 |

HCF = 6

LCM – Lowest common multiple

LCM of 9 and 12

| 9 | 9, 18, 27, (36), 45, 54 |
| 12 | 12, 24, (36), 48, 60 |

LCM = 36

The first time their multiples match

Directed number R

= −1 (red)
= 1 (yellow)

Addition

$2 + -4 = -2$

Zero pair
$(-1 + 1 = 0)$

Two "−1" left
$= -2$
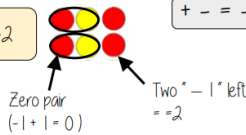
Generalisation
$+ \ - \ = \ -$

Subtraction

$= 2$

Representation for calculation

$2 - -1 = 3$

Take away one (red)

Start with the representation of 2

Generalisation
$- \ - \ = \ +$

"Subtract" – means take away or remove

$= 3$

Multiplication

$-2 \times -3 = 6$

The act of making counters into their negative is turning them over
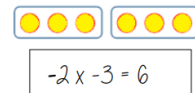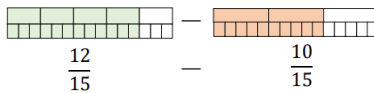
Divisions are the inverse operations

$a = 5$ $b = -4$

Brackets around negative substitutions helps remove calculation errors

$2a - b = 2 \times 5 - (-4) = 10 + 4 = \underline{14}$

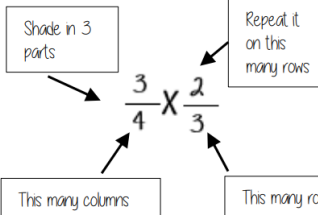## Addition/ Subtraction of fractions R

$\frac{4}{5} - \frac{2}{3}$ $\frac{12}{15} - \frac{10}{15} = \frac{2}{15}$

Use equivalent fractions to find a common multiple for both denominators

Multiplication/ Division of fractions R

Shade in 3 parts

Repeat it on this many rows

$\frac{3}{4} \times \frac{2}{3}$

This many columns

This many rows

$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$

Parts shaded

Modelled:

Total number of parts in the diagram

Remember to use reciprocals

$\frac{2}{5} \div \frac{3}{4}$

$\frac{2}{5} \times \frac{4}{3}$

Multiplying by a reciprocal gives the same outcome

Represented

$= \frac{8}{15}$