Edward Peake Church of England Middle School			
Topic: Equality and Equivalence	**Year: 7**	**NC Strand:**	**Algebra**

What should I already know?

- How to find pairs of numbers that satisfy an equation with two unknowns
- How to use a single function machine
- How to use inverse operations to find the input given the output
- How to use diagrams and letters to generalise number operations
- How to use diagrams and letters with single function machines
- How to find the function machine given a simple expression
- How to substitute values into single operation expressions
- How to find numerical inputs and outputs for a series of two function machines
- How to find the function machine given a two-step expression

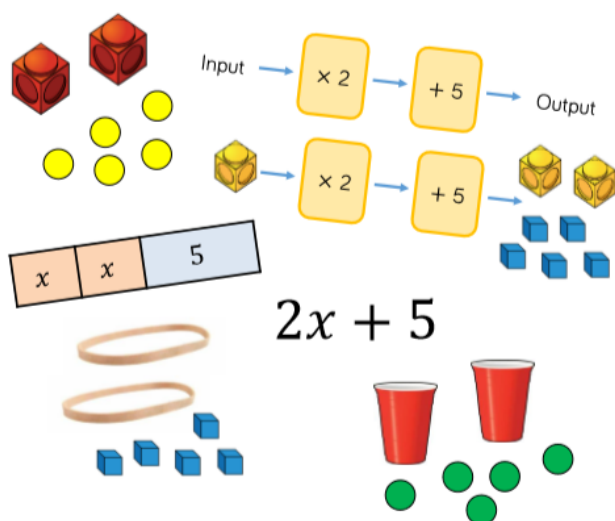## What will I know by the end of the unit?

- How to write equations correctly
- How to explain if an equation is true
- How to write and use fact families numerically
- How to write and use fact families algebraically
- How to solve one-step linear equations involving addition and subtraction by using inverse operations
- How to solve one-step linear equations involving multiplication and division by using inverse operations
- How to recognise and explain if terms are like terms or unlike terms
- How to recognise equivalent expressions and demonstrate they are equivalent
- How to collect like terms and use the symbol for equivalence

Vocabulary

Fact family	a fact family consists of four related number facts.	**Coeficient**	a number which multiplies a variable.
Equation	a mathematical statement containing an equals sign, to show that two expressions are equal.	**Index**	an index (exponent, power or order) is a small number placed to the upper-right of a base number which shows how many copies of the base number are multiplied together.
Solve	work out the answer to a problem.	**Expression**	an expression is one or a group of terms and may include variables, constants, operators and grouping symbols.
Solution	the answer to a problem.	**Equivalent**	expressions that simplify to same expression, e.g. $3(x + y)$ is equivalent to $3x + 3y$.
Inverse	opposite, reverse operations.	**Equal**	having the same amount or value.
Unknown	a variable representing an unknown quantity.	**Simplify an expression**	to remove brackets, unnecessary terms and numbers
Term	one of the numbers in a sequence, e.g. 1, 3, 5, 7, ...	**Collect like terms**	means to simplify terms in expressions in which the variables are the same
Like	are exactly the same except for their coefficients. Can be combined to make a single term.	**Variable**	a letter or symbol representing a varying quantity, for example, n in $10 + n$.
		Simplify an expression	to remove brackets, unnecessary terms and numbers

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Diagram

Key Representations

$$2x + 5$$

Key Information

We will be forming and solving equations using our knowledge of inverse operations. Equations we will meet will require the use of a calculator. This is to ensure students understand how to solve equations rather than using informal methods e.g spotting solutions. We also look at the difference between equivalence and equality by looking at collecting like terms.

Investigate/Homework tasks

- Homework will be set from the booklet issued by your teacher

- You should complete at least 30 minutes of maths tasks on Maths Whizz (not games). Please attend help sessions if you do not have access to the internet at home
- Additional work you could complete:
  - Find out more about the meaning of the vocabulary list using http://www.amathsdictionaryforkids.com/
- To challenge yourself:
  - Investigate the key questions typed in red text
  - Explain the key questions typed in purple text

Key Questions

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- What difference does it make when you swap the right hand side and the left hand side of an equation?
- If you change the order of the terms on one side of an equation, will it still be true?
- Do bar models need to be drawn to scale?
- If you know one addition fact how many subtraction facts do you also know?
- What is the difference between an equation and an expression?
- How is an unknown different from a variable?
- What is the inverse of add on 12?
- Are the equations 3x = 192 and 192 = 3y the same or different?
- How can we check the answers to our equations are correct?
- Why are 3x and $3x^2$ unlike terms?
- What is the coefficient of d in the term -7d?
- Are the expressions 2x and x^2 equivalent. Why or why not?
- Write down as many expressions as you can that are equivalent to 5p
- What's the difference between equality and equivalence?
- Can you simplify unlike terms?