Edward Peake Church of England Middle School		
Topic: Prime numbers and proof	**Year: 7**	**NC Strand: Number**

What should I already know?

- How to identify common factors, common multiples and prime numbers

What will I know by the end of the unit?

- How to find and use multiples
- How to identify factors of numbers and expressions
- How to recognise and identify prime numbers
- How to recognise and identify square and triangle numbers
- How to find factors of a set of numbers including the highest common factor (HCF)
- How to find multiples of a set of numbers including the lowest common multiple (LCM)
- How to write a number as a product of it's prime factors
- How to use a venn diagram to calculate the HCF and LCM
- How to make and test conjectures
- How to use a counter example to disprove a conjecture

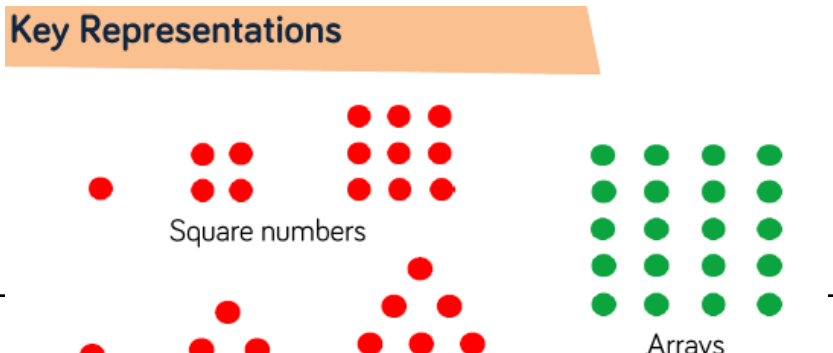
Vocabulary

Multiples	Factorise	Investigate	Lowest Common multiple (LCM)
Positive	Divisor	Square number	Prime factor
Integer	Prime number	Expression	Express
Zero	Odd	Common Factor	Union/Intersection
Factor	Even	Factorising	Conjecture
Divisible	Digit	Highest Common Factor (HCF)	Explain
Remainder	Triangular Number	Common multiple	True/False
Term	Relationship	Product	Proof
Demonstration	Always/Never/Sometimes	Systematic	Assumption
Counter example			

Investigate/Homework tasks

- Homework will be set by your teacher using google classroom
- You should complete at least 30 minutes of maths tasks using the website and log in provided by your teacher. 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: Answer the key questions to deepen your knowledge

Key Information/Diagrams



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Key Questions

How many multiples of 11 are there?

Can you have multiples of $\frac{1}{3}$?

Does zero have any multiples? Explain your answer.

Explain the difference between a factor of a number and a multiple of a number.
Can a number be both a factor and a multiple?
Can zero be a factor of a number?
Can negative numbers be factors of positive numbers?

When you add together two prime numbers, do they always give an even number? Explain your answer.

Which large numbers can you tell are not prime just by looking at their digits?

Can a number be both square and triangular?
Why do square numbers always have an odd number of factors?
What's the difference between n^2 and $n + n$?
Can triangular and square numbers be odd or even?

How many examples do you need to prove that a conjecture is always true?
Convince me that your conjecture is always true. Give me a mathematical reason.
What's meant by proof?
Why is proof different from demonstration?

What number is a common factor of all numbers?
How do we know when we have found the highest common factor?
What do you notice about the HCF of two numbers when one is a multiple of the other?

Why will the product of two numbers be a common multiple of the numbers?
When is the LCM of a set of numbers not the same as their product?
Can the HCF and LCM of a pair of numbers be the same?

Is there more than one way to factorise 12?
Is there more than one way to express 12 as a product of prime factors? Does the order of the factors matter?
What happens when you find the prime factorisation of a prime number?

$60 = 2 \times 2 \times 3 \times 5$ $168 = 2 \times 2 \times 2 \times 3 \times 7$
Why don't we write 2, 2, 2, 2, 3, and 3 in the intersect on the Venn diagram?
Why is $2 \times 2 \times 3$ the HCF of the two numbers?
Why is $2 \times 2 \times 2 \times 3 \times 5 \times 7$ the smallest of the common multiples?
How can we find a larger common multiple?

How many counterexamples do we need to disprove a conjecture?

Is it important to be systematic when looking for a counterexample? Why? What strategies could you use?