

Above and Beyond – Mathematics (Year 7)

1	<p>Title: Fibonacci</p> <p>Details: Find out the first 15 fibonacci numbers. A) How do they work? B) How would you complete the first 15 terms of a Fibonacci sequence that starts with -1, 2, 1, ... C) Make your own starting point and complete the first 15 fibonacci terms.</p> <p>Curriculum link: Sequences</p> <p>House Points: 25</p>	5	<p>Title: Self Reflection</p> <p>Details: This week is a chance to hone your skills from lesson. Find your class teacher and ask them to find a worksheet that focusses on a topic you have been working on in lesson. Complete this and present as your homework</p> <p>Curriculum link: Self reflection and improvement</p> <p>House Points: 15</p>
2	<p>Title: Golden Ratio</p> <p>Details: This week is all about the golden ratio! What is the golden ratio? How does it link to the Fibonacci numbers? Find out how the golden ratio links to the human body and present this information in the form of a poster.</p> <p>Curriculum link: Sequences</p> <p>House Points: 25</p>	6	<p>Title: Maths in Nature</p> <p>Details: So we have already figured out at this point that the Fibonacci numbers are linked to the human body amongst many other things. So can we find mathematics in nature around us? Of course we can! Mathematics is the foundation of the world around us. Your task is take a photo or find an interesting photo on the internet of mathematics in nature. Next to your photo, you will need an explanation of the mathematics behind it and why you think it is interesting</p> <p>Curriculum link: Maths in the Natural World</p> <p>House Points: 25</p>
3	<p>Title: Mathematical Art!</p> <p>Details: Using as many pieces of maths equipment as possible, create a mathematical art piece. Bonus points can be awarded for creativity and amount of equipment used!</p> <p>Curriculum link: Equipment knowledge.</p> <p>House Points: 25 – 50 depending on quality</p>	7	<p>Title: Algorithmic Approach</p> <p>Details: Follow Instructions in the presentation.</p> <p>Curriculum link: Applying algorithms.</p> <p>House Points: 10-25</p>
4	<p>Title: Pascal's Triangle</p> <p>Details: What is Pascal's triangle? Who invented it? Get yourself 4 copies of Pascal's triangle. Colour in the 2 times table on one of them, the 3 times table on another and the 6 times table on the final triangle. What did you find?</p> <p>Curriculum link: Pattern Spotting</p> <p>House Points: 25</p>	8	<p>Title: Kaprekar Constants</p> <p>Details: We are looking into something that you will need to ensure you read the instructions VERY carefully. Pick any 4 digit number (as long as the digits are not ALL the same). Put the digits in ascending order (smallest to biggest) and descending order (biggest to smallest) to create two numbers. Subtract the small number from the big number, to create a next stage number. Then repeat the process with the new number. What do you notice?</p> <p>Curriculum link: Number</p> <p>House Points: 25</p>

Find out the first 15 fibonacci numbers.

A) How do they work?

B) How would you complete the first 15 terms of a Fibonacci sequence that starts with $-1, 2, 1, \dots$

C) Make your own starting point and complete the first 15 fibonacci terms.

TASK 1

This week is all about the golden ratio!

What is the golden ratio?

How does it link to the Fibonacci numbers?

Find out how the golden ratio links to the human body and present this information in the form of a poster.

TASK 2

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Using as many pieces of maths equipment as possible, create a mathematical art piece. Bonus points can be awarded for creativity and amount of equipment used!

TASK 3

A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, set against a blue background.

Pascals Triangle.

What is Pascals triangle?

Who invented it?

Get yourself 4 copies of pascals triangle. Colour in the 2 times table on one of them, the 3 times table on another and the 6 times table on the final triangle.

What did you find?

TASK 4

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This week is a chance to hone your skills from lesson.

Find your class teacher and ask them to find a worksheet that focusses on a topic you have been working on in lesson.

Complete this and present as your homework 😊

TASK 5

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Maths in nature.

So we have already figured out at this point that the Fibonacci numbers are linked to the human body amongst many other things. So can we find mathematics in nature around us? Of course we can! Mathematics is the foundation of the world around us.

Your task is take a photo or find an interesting photo on the internet of mathematics in nature. Next to your photo, you will need an explanation of the mathematics behind it and why you think it is interesting.

TASK 6

This week is something pretty weird... Make sure you follow these steps VERY carefully...

Think of any 3-digit number, but make sure that the first digit is the biggest and the third digit is the smallest. So, for example, you could pick 531, but not 536 or 555.

Next, reverse your 3-digit number to create a new number.

Next, subtract this new (smaller) number from the original number to create what we will call the core number.

Next, reverse the core number to create the eroc number.

Finally, add the core number and the eroc number.

When you receive your answers and solutions, make sure that you check them properly.

What did you notice?

Try a few different starting points to check this is always true!

Is there any case where this does NOT occur?

TASK 7

Similar to last week, we are looking into something that you will need to ensure you read the instructions VERY carefully.

Pick any 4 digit number (as long as the digits are not ALL the same).

Put the digits in ascending order (smallest to biggest) and descending order (biggest to smallest) to create two numbers.

Subtract the small number from the big number, to create a next stage number.

Then repeat the process with the new number

TASK 8

Last week we found the 4 digit Kaprekar constant.

Your challenge this week is to complete the following:

What is the 3 digit kaprekar constant?

What happens when we try doing this process for 2 digit numbers?

What starting numbers will mean that this process does NOT work?

TASK 9

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