Tenbury High Ormiston Academy
Maths Department

Stage 6 Home Learning project.
Autumn Term

Name: …………………………………………………………….

Maths teacher: …………………………………………………

<u>Deadlines:</u>

Task 1:_____   Task 2:_____

Task 3:_____   Task 4: _____

Task 5:_____   Task 6: _____

Task 7: _____

Each week your class teacher may ask you to complete a skills check which will provide you with the opportunity to practise your fluency of key skills.

Task 1.   24

Using the paper provided in class write down twenty-four facts about the number 24.

Hint:
You could start by looking at calculations involving 24.

You should be a mathematical as you can.

Example: Nine facts about the number 9.
1. It is a multiple of 3.
2. It is a square number.
3. 1 + 8 = 9
4. It is not a prime number.
5. 27 ÷ 3 = 9
6. 4 + 5 = 9
7. 90 ÷ 10 = 9
8. 7 + 2 = 9
9. It is an odd number.

Task 2.   Problems in the millions.

Sam is trying to get as close as she can to a million. She can use
each of the digits 1 to 9, once and once only, any of the operations +, –,
x and ÷ and brackets.
She has tried two examples and has started recording her answers and
how far they are from a million.

Calculation	Answer	How far from a million?
(953 + 721) x 864	1 446 336	+ 446336
12345 x 678 ÷ 9	929990	– 70010

How close can you get to one million?

In your homework book draw a table like Sam's and try to get as close as you
can. You may use a calculator but remember to follow the correct order of
operations and use brackets where they are needed.

You should try <u>at least 10</u> different calculations.

Task 3. Happy and unhappy numbers

Look for happy numbers using the following rule:

To find the next number in the sequence, square the digits in your number and add the answers together.
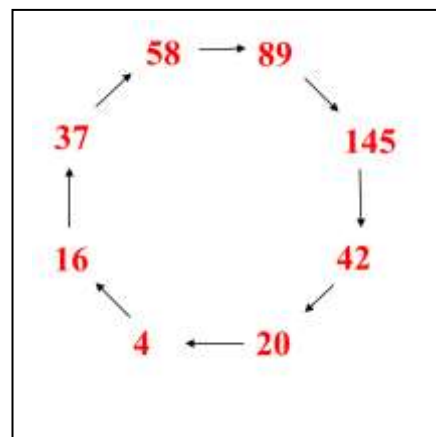
Example: Start with 58

$5^2 + 8^2$

 = 25 + 64= 89

$8^2 + 9^2$ = 145

Continue the chain in the same way.

If your chain reaches 1 then all the numbers in the chain are happy numbers.

If your chain reaches any number in the unhappy circle then all the numbers in the chain are unhappy numbers. In the example above the numbers are all unhappy ☹

Record your happy and unhappy numbers and the chains that produced them in your homework book.

How many happy or unhappy numbers can you find?

Task 4. Golden.

Research the Golden Number/Ratio/.

Make a colourful and informative poster, presentation, song, poem or video about the Golden Number and/or the Golden Ratio. Be as mathematical and creative as possible and be ready to share what you have done with the rest of the class.

Here are some weblinks to get you started:

http://nrich.maths.org/7668

http://craftwhack.com/golden-ratio-for-kids/

https://www.mathsisfun.com/numbers/golden-ratio.html

https://www.youtube.com/watch?v=CPTmRSYZupA

Task 5. Writing numbers.

People use different ways of writing numbers. See how many different ways you can collect. They may be modern ways, such as Chinese numerals, or ancient ones, such as the Aztec system. Or a system that we use today like Roman numerals.

In your homework book write a report on what you found out. Use examples to help you answer the following questions:

List some similarities and differences that you have noticed.
Do the similarities surprise you? Why?
What do the similarities and differences say about the way humans use numbers?

Try doing some calculations using different number systems. Which of these systems do you think is easier to carry out sums on a piece of paper?

Task 6. Methods for multiplication.

There are many techniques used for speedy calculation. The trick is to find the one that makes sense to you. Some people are quite at home with long multiplication and can do it quickly, on the back of an envelope if necessary. Others prefer to learn some simple rules to make the job a bit easier.

What methods do you already know?
Research other methods that can be used for multiplication. You could try the Egyptian method, The Trachtenberg Speed System or Napier's Rods (sometimes called Napier's Bones).

In your homework book write a report on what you found. Use different calculations to show how each method works and be ready to teach your favourite method to another student in your class.

Task 7. The museum of numbers.

Most people at some time in their lives will visit a museum. Museums are varied in what they exhibit – stuffed animals, armour, tapestry, space rockets, garden gnomes, masks, armoured vehicles and even pencils. Imagine a museum of numbers. What would you consider to be of suitable worth and interest to exhibit? A famous number, lucky numbers, big numbers, very small numbers, vital numbers or even a section on amusing numbers?

In your homework book or on paperncreate an information page about the numbers you have chosen. This could be a museum leaflet, small posters, PowerPoint presentation, cartoon or handout. If you have been to a museum recently you might have some other ideas.