Maths

Name: _____

Form: _____

MATHEMATICS Secondary

Transition at Turton

Welcome to 'mastery in mathematics' at Turton School

So, what is mastery?
We believe mastery means children being able to confidently and accurately use mathematical concepts, facts and strategies appropriately. They will be able to recall given number facts quickly and use these in different areas of maths to solve unknown answers. They will also have good age appropriate reasoning skills and be able to describe how they have reached an answer in their own words. They will also be able to explain it to someone else.
In essence, children will be fluent in the fundamentals, being able to reason mathematically and can solve problems using a range of strategies.

What activities are included in this pack?
We do not have activities for all the Year 6 objectives as there are so many. Instead, we have carefully put together a set of activities that will help you begin to understand whether you have mastered a particular area of mathematics.

How to use this booklet?
Work your way through the booklet answering the questions fully and as accurately as you can. Please ensure you bring this booklet into your first week's mathematics lessons when you arrive at Turton School in September, it will let us know how you got on!

Miss Wong, the teacher, has four cards. On each card is a number:

59 996	59 943	60 026	62 312

She gives one card to each pupil. The pupils look at their card and say a clue.
Anna says, 'My number is 60 000 to the nearest 10 thousand.'
Bashir says, 'My number has exactly 600 hundreds in it.'
Charis says, 'My number is 59900 to the nearest hundred.'
David says, 'My number is 60 000 to the nearest 10.'

Can you work out which card each pupil had?

Put these numbers in order, from smallest to largest.

- 3·3, 3·03, 3·33, 3·303, 3·033
- 5834, 61·8 multiplied by 100, one tenth of 45813
- 0·034, 3·6 divided by 100, ten times 0·0033
- –4·4, –4·44, –4·04, –4·404

Three pupils are asked to estimate the answer to the sum 4243 + 1734.
Andrew says, 'To the nearest 100, the answer will be 5900.'
Bilal says, 'To the nearest 50, the answer will be 6000.'
Cheng says, 'To the nearest 10, the answer will be 5970.'

Do you agree with Andrew, Bilal or Cheng?
Can you explain their reasoning?

A scientist measures the depth of some objects below the surface of the sea.
She records her measurements using negative numbers.

Object	Depth
Coral reef	−2 m
Shipwreck	−11 m
Pirate treasure	four times as deep as the coral reef
Sleeping shark	3 metres above the shipwreck

Which object is deepest? Explain your choice.

Is the sleeping shark deeper than the pirate treasure? Explain your reasoning.

A seagull is hovering 1 m above the surface of the sea. How far apart are the seagull and the coral reef?

A scientist measured the temperature each day for one week at 06:00.

On Sunday the temperature was 1·6°C.
On Monday the temperature had fallen by 3°C.
On Tuesday the temperature had fallen by 2·1°C.
On Wednesday the temperature had risen by 1·6°C.
On Thursday the temperature had risen by 4·2°C.
On Friday the temperature had fallen by 0·9°C.
On Saturday the temperature had risen by 0·2°C.

What was the temperature on Saturday?

Calculate 36·2 + 19·8

- with a formal written column method
- with a mental method, explaining your reasoning.

Jasmine and Kamal have been asked to work out 5748 + 893 and 5748 – 893.

Jasmine says, '893 is 7 less than 900, and 900 is 100 less than 1000, so I can work out the addition by adding on 1000 and then taking away 100 and then taking away 7.'

What answer does Jasmine get, and is she correct?

Can you use five of the digits 1 to 9 to make this number sentence true?

$\square\square \cdot \square + \square \cdot \square = 31{\cdot}7$

Can you find other sets of five of the digits 1 to 9 that make the sentence true?

Put brackets in these number sentences so that they are true.

$12 - 2 \times 5 = 50$

$12 - 8 - 5 = 9$

$10 \times 8 - 3 \times 5 = 250$

Choose operations to go in the empty boxes to make these number sentences true.

6 ☐ 3 ☐ 7 = 16

6 ☐ 3 ☐ 7 = 27

6 ☐ 3 ☐ 7 = 9

Write different number sentences using the digits 2, 3, 5 and 8 before the equals sign, using:

- one operation
- two operations but no brackets
- two operations and brackets.

Can you write a number sentence using the digits 2, 3, 5 and 8 before the equals sign, which has the same answer as another number sentence using the digits 2, 3, 5 and 8 but which is a different sentence?

A shop sells magazines and comics. Freya buys a magazine and a comic. She pays £2·50. Evie buys a magazine and two comics. She pays £3·90.

How much does a comic cost? How much does a magazine cost?

Fill in the missing numbers to make these number sentences true.

$\square \times \square = 864$

$\square \times \square \times \square = 864$

A box of labels costs £24.
There are 100 sheets in the box.
There are 10 labels on each sheet.

Calculate the cost of one label, in pence.

Miriam and Alan each buy 12 tins of tomatoes.
Miriam buys 3 packs each containing 4 tins. A pack of 4 costs £1·40.
Alan buys 2 packs each containing 6 cans. A pack of 6 costs £1·90.

Who gets the most change from a £5 note?

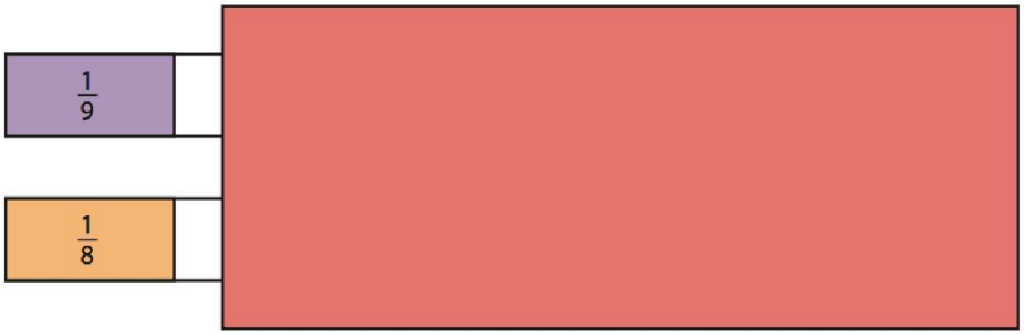
All the pupils in a school were asked to choose between an adventure park and the seaside for a school trip.

They voted, and the result was a ratio of 5:3 in favour of the adventure park.

125 children voted in favour of going to the adventure park.

How many children voted in favour of going to the seaside?

Only a fraction of each whole rod is shown. Using the given information, identify which whole rod is longer.



Explain your reasoning.

Put the following numbers on a number line:

$\frac{3}{4}$, $\frac{3}{2}$, 0·5, 1·25, 3 ÷ 8, 0·125

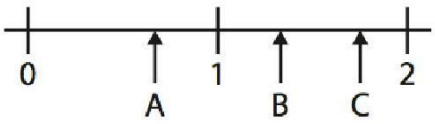
On Monday I ran $1\frac{2}{3}$ km and on Tuesday I ran $2\frac{2}{5}$ km.
How far did I run altogether on these two days?

On Wednesday I ran $1\frac{2}{3}$ km and my sister ran $2\frac{2}{5}$ km.
How much further did my sister run than I did?

Roland cuts a sandwich into two pieces. First, Roland gives one piece to Ayat and the other piece to Claire. Then Claire gives Ayat half of her piece. Now Ayat has $\frac{7}{8}$ of the original sandwich.

Did Roland cut the sandwich into two equal pieces? If not, how did he cut the sandwich?

Suggest a fraction that could be at point A, a decimal that could be at point B and an improper fraction that could be at point C on this number line.



In each number sentence, replace the boxes with different whole numbers less than 20 so that the number sentence is true:

$$\frac{1}{\square} = \frac{3}{\square}$$

$$\frac{\square}{3} = \frac{\square}{12}$$

$$\frac{\square}{\square} = \frac{\square}{\square}$$

$$\square \div \square = \square \cdot \square$$

$$\frac{30}{\square} = \frac{45}{\square}$$

In each number sentence, replace the boxes with different whole numbers less than 20 so that the number sentence is true:

$$\frac{1}{\square} \times \frac{3}{\square} = \frac{\square}{\square}$$

$$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{8}{15}$$

$$\frac{2}{\square} \times \frac{5}{\square} < \frac{10}{\square}$$

$$\frac{\square}{\square} \div 3 = \frac{1}{\square}$$

$$\frac{\square}{\square} \div 3 > \frac{1}{4}$$

Leonhard Euler (1707-1783) was born in Switzerland. His father was a preacher and wanted his son to give up mathematics and enter the church. Euler went on to become a great mathematician, winning many prizes and providing masses of work for others to continue. Prime numbers caused him problems. He said: 'Mathematicians have tried in vain to this day to discover some order in the sequence of prime numbers, and we have reason to believe that it is a mystery into which the human mind will never penetrate'.

'The moving power of mathematical invention is not reasoning but imagination.' Augustus De Morgan (1806-1871)

Sonya Koralovsky (1850-1891) was born in Russia. She learned mathematics from her uncle and the walls in her bedroom, which were covered in mathematical calculations and formulae. She said: 'Mathematics requires a great amount of imagination'.

Karl Friederich Gauss (1777-1855) was born to poor parents in Germany. He had a photographic memory and saw the answers to problems before he had the method for solving them. He said: 'I have had my results for a long time, but I do not yet know how I am to arrive at them'.

'Perfect numbers like perfect men are very rare.' René Descartes (1596-1650)

'There is no problem that cannot be solved.' François Viète (1540-1603)

'Numbers are the free creation of the human mind.' Richard Dedekind

'Number is all things.' Pythagoras

'Where is number is beauty.' Roclus

Isaac Newton (1642-1727) was such a tiny baby that he was not expected to live. He was brought up by his grandmother and attended school in Grantham where he was taught very little mathematics. At twenty he went to Cambridge University but had to leave because of the plague. He spent two years at home when he created most of the great mathematics he went on to develop. He is best known for his 'laws of gravity' which helped other mathematicians to explain and predict events such as tides and the mass of the moon. He said: 'I seem to have been only like a boy playing on the seashore, now and then finding a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me'.

'People who don't count, won't count.' Anatole France

'Number proceeds from unity.' Aristotle

'The control of large numbers is possible, and like unto that of small numbers, if we subdivide them.' Sun Tze