Maths Information

We thought this sheet might be helpful to:
- Help you with any homework problems that arise;
- Have a clear understanding of what you need to know by the end of Year 6.

Place Value:

The column headings for the numbers we write are:

Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	units	Tenths (Decimal)	Hundredths (Decimal)	Thousandths (Decimal)

- To multiply a number by 10, you move the digits one place left. The vacant place is filled by a zero.
- To multiply a number by 100, you move the digits two places left. The two vacant places are filled by two zeros.
- To multiply a number by 1000, you move the digits three places left. The three vacant places are filled by three zeros.

- To divide by 10, move all the digits one place to the right. If there was a zero on the end of the original number, it falls off.
- To divide by 100, move all the digits two places to the right. If there were any zeros on the end of the original number, they fall off.
- To divide by 1000, move all the digits three places to the right. If there were any zeros on the end of the original number, they fall off.
- For decimal numbers the above rules still apply – just keep the decimal in the same place.

Symbols:

> means "more than"

< means "less than"

≥ means "in descending order" (going down)

$\leq$ means "in ascending order" (going up)

= means "equal to"

$\approx$ means "approximately equal to"

Rounding:

- Rounding numbers to the nearest 10: look at the units digit.
  If less than 5, round down.
  If 5 or above, round up.
- Rounding to the nearest 100: look at the tens and units together.
  If less than 50, round down.
  If 50 or above, round up.
- Rounding to the nearest 1000: look at the hundreds, tens and units together.
  If less than 500, round down.
  If 500 or above, round up.
- Decimals work in a similar way: If it's less than .5, round down to the nearest whole number. If it's .5 or above, round up.

General Number:

- The larger the negative number, the smaller it is!! e.g. –5 is smaller than –2

- Numbers multiplied by themselves make "square numbers." e.g. 4 x 4 = 16 (16 is the square number.) A short way of writing this is 4^2.

- Square roots are the opposite of square numbers, e.g. the square root of 144 is 12. We write it $\sqrt{144}$ = 12

- Cubed numbers are numbers that are multiplied by themselves 3 times (4^3 = 4x4x4 =64)

- A multiple is a number which you get from a multiplication sum, e.g. some multiples of 4 are 4, 16, 24, 40, 48, 800, etc.

- Multiples do not end at ten times the number or twelve times the number. They carry on beyond the 12x table!

- Factors are those numbers which will fit into other numbers exactly (no remainders.)
- e.g. the factors of 24 are 1, 24, 2, 12, 3, 8, 4 and 6
- Factors normally go in pairs.
- A number which can only be divided by itself and 1 is called a prime number, e.g. 23 is a prime number because no other numbers can fit equally into it (other than 1 and 23).

Calculations:
- When adding numbers on paper, always line up the digits carefully.
- There are several ways to add mentally. Find a strategy you are happy with, depending on the calculation.

- When subtracting, remember that you can only take a small number from a bigger number.
- You can count on from a small number to a bigger number as a method of subtracting.

- Always check your answer. Think about the size of the answer you expect to get.
- Also check the units, e.g. 6 + 7 = 13. Therefore, 26 + 37 = 63 (look at the units, they both end in 3!)

- When multiplying, always remember that you can partition (split) the sum up, e.g. 23 x 34 = (20 x 30) + (20 x 4) + (3 x 30) + (3 x 4)
- Multiplying and dividing are opposites.

- You can always adjust the sum by rounding, e.g. for 46 x 21 you could do (46 x 20) + (1 x 46). This also works for multiplying other numbers which are close to 20 etc.

- Use brackets to show which calculations you are doing and in which order they come. Remember BIDMAS!

- Make sure you know doubles and halves.

Measure:
- Know your measurements:

  e.g.   10 mm = 1 cm
              100 cm = 1 m
              1000 m = 1 km
              1000 g = 1 kg
              1000 ml = 1 litre

  and always remember to write the correct ones down!

- Think carefully about how to convert from one measurement to another:

  e.g.   to convert from metres to centimetres you multiply by 100
              to convert from centimetres to metres you divide by 100.

Make sure you know how to convert between the others.

- You must know 60 secs = 1 minute, 60 mins = 1 hour and all the other time related facts such as hours in a day, days in a week, etc.

- Make sure you know the equivalent times for the 24hr clock and the 12hr clock, e.g. 2 o'clock = 14.00 hours.

Shape:
- To find the area of a rectangle you multiply the length by the width. The answer will be in squared cm, mm, m, etc.

- To find the perimeter of a rectangle (the total length of the outside of the shape) you add one length to one width and multiply by 2.

- There are 360° in a circle. This is made up of 4 right angles (each 90°).

- There are 180° in a straight line.

- Triangles: There are 4 different types of triangle. You can remember them by the initials R I S E
  R = right angled (one 90° angle)
  I = isosceles (two angles the same and two sides same)
  S = scalene (no angles or sides equal)
  E = equilateral (all 3 angles measure 60° and all sides same)

- You must know the names of the 2D shapes. These are collectively called polygons.

- Know the definitions of parallel and perpendicular lines.

- You should know the names of the common 3D shapes.

- You can mark a co-ordinate on a grid by giving two numbers in brackets, e.g. (3, -4). These numbers relate to numbers on the x axis and the y axis. You always read co-ordinates horizontally then vertically – x axis then y axis.

Fractions:
- Fractions are parts of whole numbers. The number at the top is the numerator. Underneath is the denominator.
- A fraction like ¾ is a proper fraction.
- A fraction can be "top heavy" or improper when the numerator is larger than the denominator, e.g. 7/4. This is just the same as having 1 ¾.

- The larger the denominator the smaller the size of the fraction.
- Adding and subtracting fractions – ensure the fractions have the same (common) denominator. Then the denominator stays the same and you add or subtract the numerators only. E.g. 2/9 + 3/9 = 5/9 or 7/10 – 2/10 = 5/10.
- To multiple fractions:
  - 2 fractions – multiply the numerators, then the denominators ($\frac{1}{8}$ x $\frac{1}{4}$ = 1/32).
  - A fraction x a whole number – multiply the numerator and the whole number and the denominator stays the same ($\frac{1}{8}$x3 = 3/8)
- To divide fractions:
  - A fraction ÷ a whole number – multiply the denominator by the whole number and the numerator stays the same ($\frac{1}{8}$÷6 = 1/48).
- Always simplify fractions at the end of a calculation, if you can. E.g. 5/10 = $\frac{1}{2}$.

Decimals and Percentages:
- Decimal places mean the number of places after a decimal point.
- As you go to the right after the units column you have a decimal point, then tenths, then hundredths, then thousandths, etc.
- Be careful when adding or subtracting decimals so that you get the digits in the right places!
- You should know: 0.5 = $\frac{1}{2}$ = 50%
  0.25 = $\frac{1}{4}$ = 25%
  0.75 = $\frac{3}{4}$ = 75%
  1.0   = 1 = 100%
  0.1   = 1/10 = 10%
  0.2   = 2/10 = 20%   etc.

- Percentages can be found easily. You should know how to find 50% by halving, 25% by halving again (or quartering), now 75% can be found by multiplying that by 3. It's easy to find 10% because you divide by 10. Then you can find 5% or 20% if necessary. 1% is easy because you can divide by 100 or divide by 10 twice!
- Remember: "of" also means multiply (15% of 20 = 15% X 20)

Probability:
- Probability means "how likely?" or "the chances of"
- Remember that you can have a 0 chance or a 1 chance and you can mark these on a line. Then you can have an even chance ($\frac{1}{2}$ or 50%) etc.

Data:
- Take care with charts and tables. Remember how to draw a tally chart!
- Think carefully about labelling graphs' axis and giving the graph a title.
- For bar graphs you label the x axis in the middle of the square.
- For line graphs or bar line graphs, label on the line.
- Remember that line graphs are designed to show trends because the points that you join up have meaning, e.g. for temperature.

Remember: ALWAYS READ QUESTIONS CAREFULLY, SHOW YOUR WORKINGS AND CHECK YOUR ANSWERS.