Year 6: Autumn term 1

Topics studied this half term:

- Number and place value
- Addition, subtraction, multiplication and division
- Calculating with fractions

Within number and place value, your children will be learning to:

- Read, write, order and compare numbers to 10,000,000
- Round any number to any given degree of accuracy
- Calculate and solve problems involving negative numbers

Within addition, subtraction, multiplication and division, your children will be learning to:

- Multiply up to a 4 and 5 digit numbers by a 2-digit number using the column method
- Divide by 1 and 2-digit numbers using short and long division
- Divide using factors
- Establish common factors and multiples
- Identify prime, square and cube numbers
- Calculate using the correct order of operations
- Perform mental calculations and estimation
- Reason from known facts

Within calculating with fractions, your children will be learning to:

- Simplify fractions
- Place fractions on a number line
- Compare and order fractions using the numerator and denominator
- Add and subtract fractions
- Multiply fractions by integers
- Multiply fractions by fractions
- Divide fractions by integers
- Find a fraction of an amount
- Using a fraction of an amount to find the whole

Tips for good homework habits:

Plan a homework timetable and agree a time when your child will do their homework.

Number and place value

HERE'S THE MATHS

Your child is learning to read, write, order and compare numbers to 10 000 000. They are also consolidating their understanding of rounding numbers to a required degree of accuracy. The rule for rounding to the nearest 10 (100, 1000, 10 000 and so on) is that 5 (50, 500, 5000 and so on) or greater is rounded up and 4 or fewer (49, 499, 4999 and so on) is rounded down.

ACTIVITY

What to do

- Each person has a set of 0–9 cards.
- Lay out 7 cards.
- Use the cards to make the largest 7-digit number possible.
- Read your numbers to one another.
- The person with the larger number scores a point.
- Shuffle the cards and repeat.
- The winner is the first person to reach a score of 5.

Variation

- Play the same game but make the smallest number.

You will need:

- 2 sets of 0–9 digit cards from a pack of playing cards (use Jacks to represent zero)

QUESTIONS TO ASK

How is zero used as a placeholder? (*Zeros keep the digits in the correct places.*)

What is the 2 worth in these numbers:
1 256 789? (*two hundred thousand: 200 000*)
1 567 234? (*two hundred: 200*)
1 426 000? (*twenty thousand: 20 000*)

What happens to digits when you divide by 1000? (*The digits move one place to the right.*)

Which digits change when you add 1 to 999 999? Why?
(*All of them, because adding one more to each nine changes the value to 10.)*

Multiplication and division

HERE'S THE MATHS

Your child is practising multiplication calculations, including with large numbers, e.g. ThHTO × O and TO × TO. They are learning to scrutinise a calculation to determine the best method to solve it. They can perform mental calculations, using jottings as appropriate, or a formal written method. They are encouraged to estimate and check answers.

ACTIVITY

You will need:
- pencil and paper

What to do

- Ask your child to look at these calculations and possible answers and use their mathematical knowledge of multiplication to choose and explain the correct one.

  34 × 57? **A** 2130 **B** 1938 **C** 1875 **D** 8978
- One explanation (of many possible) is as follows. The ones digit in the correct answer must be 8 because 4 × 7 is 28, therefore it cannot be A or C. An estimate of the answer is 30 × 60 which is 1800, which means D is too big and so the correct answer is B.
- Now use a formal written method to see if 1938 is actually correct.
- Each try carrying out a similar type of analysis of one of the following calculations.

  67 × 58? **A** 1207 **B** 3764 **C** 1273 **D** 3886

  83 × 26? **A** 2158 **B** 3158 **C** 2150 **D** 7158
- Write similar questions for each other to try.
- Listen to one another's reasoning carefully.

Variation

- Write calculations and possible answers for each other for calculations of the type ThHTO × O.

QUESTIONS TO ASK

If 6 × 7 = 42, tell me two more multiplication calculations that you know. (*60 × 7, 6 × 70, 60 × 70, etc*.)

What is the ones digit in the answer to 37 × 17? (*9*)

Estimate the answer to 37 × 28? (*1200*) Do you think the exact answer will be greater or smaller than your estimate? (*Smaller*) Why? (*Because to estimate, you will round up to 40 x 30*)

Estimate the answer to 3139 × 4? (*12 000 or 12 400*) Do you think the exact answer will be greater or smaller than your estimate? (*Greater*) Why? (*Because to estimate, you will round down to 3000 or 3100*)

Fractions

HERE'S THE MATHS

Your child is using **common factors** to simplify fractions and **common multiples** to express fractions in the same denominator. The lowest common multiple (LCM) is the smallest number required to add fractions with different denominators, e.g. to calculate $\frac{2}{3}+\frac{1}{4}$, the LCM is 12 because 12 is the first common multiple of 3 and 4, so $\frac{2}{3}+\frac{1}{4}=\frac{8}{12}+\frac{3}{12}=\frac{11}{12}$. Simplifying fractions is changing them by dividing the numerator and denominator by a common factor, e.g. $\frac{15}{30}=\frac{3}{6}=\frac{1}{2}\cdot\frac{1}{2}$ is this fraction in its simplest form.

ACTIVITY

You will need:
- pencil and paper
- coin

What to do

Numerator	1	2	3	Denominator	4	5	6

- Each person makes up two fractions by selecting different numerators and denominators, e.g. $\frac{2}{5}$ and $\frac{3}{4}$.
- Add the fractions by finding the LCM, e.g. $\frac{2}{5}+\frac{3}{4}=\frac{8}{20}+\frac{15}{20}=\frac{23}{20}=1\frac{3}{20}$.
- Compare your fractions.
- Toss the coin – for heads, the larger fraction scores a point, for tails, the smaller fraction scores a point. You may need to find a new LCM to find out the winner.
- Play for a set time or until one person reaches a score of 5 points.

Variations

- For a simpler version use these figures:

Numerator	1	2	Denominator	3	4	5

- For a more complex version, use a greater variety of numerators and denominators.

QUESTIONS TO ASK

What is the lowest LCM required to add $\frac{1}{10}$ and $\frac{1}{5}$? (*10*)

What is the lowest LCM required to add $\frac{1}{7}$ and $\frac{1}{4}$? (*28*)

Simplify $\frac{9}{27}$ ($\frac{9}{36}$, $\frac{9}{18}$, $\frac{9}{90}$, $\frac{9}{45}$) Answers $\frac{1}{3}$,($\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{10}$, $\frac{1}{5}$)

Express 2 in quarters, eighths and sixteenths. ($\frac{8}{4}$, $\frac{16}{8}$, $\frac{32}{16}$)

Put these fractions in order without finding a LCM: $\frac{3}{7}$, $\frac{3}{4}$, $\frac{3}{11}$. Explain your thinking. (*Quarters are bigger than sevenths because the whole has been divided into fewer parts.*)