



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.

You will need:

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

Variation

- Play the same game but make the smallest number.

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

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.

You will need:

- pencil and paper

Variation

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

QUESTIONS TO ASK

If $6 \times 7 = 42$, 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 40×30)

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. $\frac{15}{30} = \frac{3}{6} = \frac{1}{2}$. $\frac{1}{2}$ is this fraction in its simplest form.

ACTIVITY

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.

You will need:

- pencil and paper
- coin

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 $\frac{1}{3}$, ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{10}$, $\frac{1}{5}$)

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.)

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



Topics studied this half term:

- Fractions, decimals and percentages

Within fractions, decimals and percentages, your children will be learning to:

- Calculate with decimals with up to three decimal places
- Multiply and divide integers and decimals by 10, 100 and 1000
- Multiply and divide decimals by integers
- Use division to solve problems
- Convert from decimals to fractions
- Convert from fractions to decimals
- Convert from fractions to percentages
- Identify equivalent fractions, decimals and percentages
- Order fractions, decimals and percentages
- Find a percentage of an amount
- Use percentages to find missing values

Tips for good homework habits:

Choose a quiet place to work, preferably sitting at a table, where your child can work comfortably without being disturbed.

Fractions

HERE'S THE MATHS

Your child is practising adding and subtracting fractions with different denominators and mixed numbers, using the concept of equivalent fractions. In order to add or subtract fractions, they need to be changed to an equivalent fraction with the same denominator,

e.g. $\frac{1}{3} + \frac{3}{8} = \frac{8}{24} + \frac{9}{24} = \frac{17}{24}$. Answers are best expressed in their simplest form,

e.g. an answer of $\frac{6}{8}$ should be simplified to $\frac{3}{4}$.

ACTIVITY

| | | | |
|---------------------------|----------------------------|----------------------------|----------------------------|
| 1 $\frac{1}{4}$ | 2 $\frac{4}{5}$ | 3 $\frac{3}{8}$ | 4 $\frac{7}{8}$ |
| 5 $\frac{1}{8}$ | 6 $\frac{3}{5}$ | 7 $\frac{1}{2}$ | 8 $\frac{5}{8}$ |
| 9 $\frac{1}{5}$ | 10 $\frac{3}{4}$ | 11 $\frac{2}{5}$ | 12 $\frac{3}{2}$ |

What to do

- One person shuffles the cards, and turns over 3 cards. In the table above, they find the fraction represented by the cards. They add the fractions by finding a common denominator and simplifying the answer if possible.
- The second person checks the addition.
- Change roles. Repeat twice more.
- Keep a note of all 6 answers.
- Race one another to put the fractions in increasing order.

You will need:

- pack of playing cards with the Kings removed (Jack represents 11, Queen 12)

QUESTIONS TO ASK

What is an improper fraction? (fraction with the numerator bigger than the denominator)

Change $\frac{14}{4}$ to a mixed number in its simplest form. ($\frac{31}{2}$)

Simplify $\frac{9}{45} \cdot \left(\frac{1}{5}\right)$



Fractions

HERE'S THE MATHS

Your child is learning to multiply simple pairs of fractions, writing the answer in its simplest form. To multiply fractions, multiply the numerators of the fractions to find the new numerator and multiply the denominators of the fractions to find the new denominator. To remember the method, it can help to carry out the simplest possible calculation, i.e. $\frac{1}{2} \times \frac{1}{2}$ because this is easy to visualise as $\frac{1}{4}$. To reduce or simplify a fraction, you need to find the common factors of the numerator and denominator, e.g. $\frac{9}{15}$: the common factor of 9 and 15 is 3 so it can be simplified to $\frac{3}{5}$.

ACTIVITY

What to do

- Take turns to generate fractions to multiply.
- Roll the dice to make a proper fraction (if they are the same, re-roll one dice), e.g. 4 and 3 gives $\frac{3}{4}$.
- Roll them again to give a second fraction, e.g. 5 and 2 gives $\frac{2}{5}$.
- Multiply the pair of fractions, e.g. $\frac{3}{4} \times \frac{2}{5} = \frac{6}{20}$.
- Simplify the answer: $\frac{6}{20} = \frac{3}{10}$.
- Put the answer on a number line from 0 to 1.
- The largest and the smallest fractions are the winning ones. If you have one each, it's a draw!

You will need:
• two 1–6 dice

Variation

- Use digit cards 1–9 to increase the range of possible fractions.

QUESTIONS TO ASK

What is $\frac{1}{4}$ of $\frac{1}{2}$? ($\frac{1}{8}$)

Calculate $\frac{1}{2} \times \frac{3}{5}$ ($\frac{3}{10}$)

What is $\frac{6}{10} \times \frac{2}{3}$ in its simplest form? ($\frac{2}{5}$)

Fractions (including decimals and percentages)

HERE'S THE MATHS

Your child is learning to solve problems involving the calculation of percentages and the use of percentages for comparison. They should know that 1% is $\frac{1}{100}$, 10% is $\frac{1}{10}$, 25% is $\frac{1}{4}$, 50% is $\frac{1}{2}$, and 75% is $\frac{3}{4}$. To calculate 35% of an amount they can calculate 10%, multiply that by 3 and add half of 10%. Another way would be to find the value of 1% and multiply that by 35.

ACTIVITY

| Player 1 | Player 2 |
|--|--|
| <input type="text"/> <input type="text"/> % of <input type="text"/> <input type="text"/> 0 0 | <input type="text"/> <input type="text"/> % of <input type="text"/> <input type="text"/> 0 0 |

You will need:

- 0–9 digit cards from a pack of playing cards (use Jacks to represent zero)
- pencil and paper

What to do

- Player 1 shuffles the cards and turns over four cards to fill the spaces.
- Calculate the percentage, using an appropriate method.
- Player 2 has a turn.
- The player with the larger number scores a point.
- Repeat with new cards.
- The winner is the first person to reach 5 points.

Variation

- To make it easier, find 1-digit percentages of a 3-digit number using:
 % of 0

QUESTIONS TO ASK

What is 1% of 570? (5.7)

How would you find 15% of 340? What is the answer? (51)

How would you find 35% of 280? What is the answer? (98)

Which is bigger? 25% of 300 or 40% of 200? (40% of 200 = 80 whereas 25% of 300 is 75)

What percentage is 30 of 150? (20%)

