Contents

Steps to Success and Top Tips – Year 5

Key Learning Objectives

1. To multiply and divide numbers to 10000 by 10 or 100 and understand the effect

Top Tips

Multiply

- To multiply by 10, move all the digits one place to the left
- To multiply by 100, move all the digits 2 places to the left

Divide

- To divide by 10, move all the digits one place to the right
- To divide by 100, move all the digits 2 places to the right

Remember

- *Write the place value columns to help.*
- *The decimal point never moves (remember the decimal point dance)*
- *When dividing the number is **R**educed and the digits move to the **R**ight*
- *When multiplying the number gets **L**arger and the digits move to the **L**eft*
- *Number of zeros is the clue to the how many places to move.*
- *Remember to put zeros as place holders in any columns left empty.*
- *Remember each place value column is 10 times larger than the last when you move to the left and 10 times smaller as you move to the right*

2. To order positive and negative numbers

Steps to Success

1. Draw a number line with 0 in the middle.
2. Mark the positive numbers on the number line to the RIGHT of the 0.
3. Mark the negative numbers on the number line to the LEFT of the 0.
4. Circle the numbers you need to order on the number line
5. Copy your circled numbers the same order.

Top Tips

- Negative numbers are less than zero

- Negative numbers are opposite to positive numbers. The 0 line is like a mirror line.

- Negative numbers have less value than positive numbers

- Use a context to explain negative numbers, e.g. Temperature, lifts, money

- Always use the term **negative** not minus (minus is the operation – weather people get it wrong)

3. To use decimal notation for tenths and hundredths

Top Tips

- If there are no units then you need a 0 in the units column before the decimal point e.g. 0.9

- Zeros can be used as placeholders to the right of the number e.g. 9.100

- Each place value column is 10 times larger as you move to the left, 10 times smaller as you move to the right

- Write column headings – **H T U .** $\frac{1}{10}$ $\frac{1}{100}$

- Encourage children to record one digit per square, putting the decimal point on the line between the units column and the 1/10 column.

4. To round a number with one or two decimal places to the nearest whole number

Steps to Success

e.g. **3.47**

Memorise this poem:

1. Find your digit (the whole number 3)
2. Look **right** next door.
3. 4 or less just ignore.
4. 5 or more, add 1 more.

5. To understand how fractions link to division

Top Tips

- The larger the denominator the smaller each unit fraction (where 1 is the numerator) because the whole is divided into more pieces. Link to slices of pizza.
- Provide context of sharing something of value to them, e.g. pizza
- Show link between written representation of fractions and the division sign
- **D**enominator – **d**ivide – **d**own (at the bottom)
- Denominator = how many equal parts a whole is divided into
- Numerator = how many of the equal parts of the whole there are

6. To know the decimal equivalent to fractions (½, 1/3, ¼, 1/10)

Top Tips

Learn off by heart:
½ = 0.5
¼ = 0.25
1/3 = 0.333
1/10 = 0.1 (link to place value headings)
¾ = 0.75

7. To calculate mentally a difference

Steps to Success

Partitioning

1. Put the larger number in your head
2. Partition the smaller number into H, T, U
3. Take away the hundreds
4. Take away the tens
5. Take away the units

Top Tips – partitioning

- Partitioning is best when the digits of smaller number are smaller than the corresponding digits of the larger number.

Compensation (rounding and adjusting)

1. Look at the numbers. Can any be rounded to the nearest 10, 100, 1000?
2. Carry out the simpler calculation.
3. Adjust answer allowing for original rounding.

Top Tips – compensation

- Compensation is best when the smallest number **CAN** be rounded up e.g. £3.99 rounded to £4

Counting up

1. Put the smaller number in your head
2. Count on to the nearest ten
3. Then count on to the nearest hundred

8. To carry out column addition of numbers less than 10,000

Steps to Success

1. Write each digit in the correct place value column *(if appropriate make sure that the decimal point is lined up.)*
2. Start with the column on the right and add up all the numbers in that column.
3. If one of the columns add up to an answer of 10 or more:
   a. put the right digit of the answer in that column and
   b. carry the left digit to the column on the left, writing it under the bottom line.

5. Repeat with all the columns. Remember to add any carrying as well.

```
     Th   H   T   U
          3   0   2
          2   1   3
      4   6   8   5
  +           1   4
     ----------------------------
      5   2   1   4
     ----------------------------
          1   1   1
```

Top Tips

- Write the column headings to help you.

9. To carry out column subtraction of numbers less than 10000

Steps to Success

1. Write the greatest number on top, line up the digits in the place value columns.
2. Make sure the decimal points are lined up.
3. Start by subtracting the column on the right, taking the bottom number away from the top.
4. If the top digit is less than the digit you are going to subtract, you need to exchange with a digit in the column to the left. *Make the left neighbour 1 less, write the 1 beside your digit on its left)*

```
        H    T    U
                5    1
        3    6̶    1
    -        3    4
        -----------------
        3    2    7
        -----------------
```

Top Tips

- Keep everything in the correct columns.
- Exchange if necessary.
- When exchanging, cross out digit you are exchanging with and take away one from it. Write the new number above it.
- Remember you cannot take away from 0 so you need to exchange with the column to the left. **ALSO** remember you cannot exchange with 0 so you need to exchange with the next column.

10. To know by heart all multiplication facts up to 10 × 10

Top Tips

To multiply by 4, just double it and double it.
The 6 times table is double the 3 times table.
The 8 times table is double the 4 times table etc.
5, 6, 7, 8 – reminds you that 56 = 7 x 8
The sum of the digits in the 9 times table digits add up to 9.
Remember finger trick for the 9 times tables.
Remember 4x5 = 5x4 etc. you only need to learn half as many facts!

11. To carry out short multiplication

Steps to Success

1. Multiply the single digit number by each digit of the greater number in turn (starting with the units).

2. Each time you get an answer 10 or more, carry the left digit to the next column (like you do when you are adding)

12. To carry out short division

Steps to Success

1. Divide into the big number, one digit at a time, starting from the LEFT (It's the opposite side from when you are adding, subtracting and multiplying)
2. Put the result of each division directly above, on the top of the 'bus stop'
3. If the small number won't go into a digit exactly, carry the remainder across (to the next digit on the right). If it won't go at all put a 0 on top and carry the whole digit.

Top Tips

- Extend bus stop analogy to numbers that are 'out in the rain' and sheltered numbers.

- Use you multiplication facts to help.

- Remember that division is about sharing into groups – you are finding out how many groups of the lower value number can fit into/be taken out of the greater number.

- Division is repeated subtraction just as multiplication is repeated addition.

- A number of children will need to perform the grouping/sharing process with practical apparatus.

13. To carry out long multiplication of a TU by TU

Steps to Success

1. Set out the numbers according to place value.

```
                    T    U
                    7    2
      x             1    8
      ---------------------------------

      ---------------------------------
```

2. Multiply each digit of the top number by the digit in the units column of the bottom number, starting with the units column and then the tens.

```
                    T    U
                    7    2
      x             1    8
      ---------------------------------
                    --
            5    7    6
                    1
```

4. Because you are now going to multiply by the tens column, put a zero in the units column of your answer before you start.

```
      T                 T    U
                        7    2
      X                 1    8
      ---------------------------------
            5           7    6
                             0
```

5. Multiply each digit of the top number by the digit in the tens column of the bottom number.

```
                              T   U
                              7   2
              X               1   8
          -----------------------------------
                      5       7   6
                      7       2   0
```

6. Add the two answers to obtain the final answer.

```
      T               T   U
                      7   2
      X               1   8
      ------------------------------------
              5       7   6     This is 72 x 8 units.
              7       2   0     This is 72 x 1 ten.
      ------------------------------------
      1       2       9   6     This is 72 x 18.
```

Top Tips

- When you multiply by the tens column and you need to put a place holder zero. Turn the 0 into a smiley face for fun!
- Start writing your calculation three squares in from the margin because the answer will grow.
- Highlight each stage using different colours.

14. To use all four operations to solve simple word problems

Steps to Success

1. **R**ead and understand the problem.
2. **U**nderline key information.
3. **D**ecide what you need to work out (*which operation?*).
4. **E**stimate

5. **C**alculate
6. **A**nswer in a sentence.
7. **T**ake time to check your answer.

Top Tips

- Record your working throughout. You can use jottings but write them down clearly so you can trace back your steps when you are checking your answer.
- Reality Check – is your answer sensible?

15. To explain methods and reasoning

Top Tips

- Break your method down into clear steps
- Use mathematical language to explain your method

Steps to Success and Top Tips
Shape, Space, Measures and Data Handling – Year 5

Key Learning Objectives

16. To understand area measured in square centimetres (cm^2)

Top Tips

- Area is the amount of surface covered by a flat shape.
- cm^2 = a square that has each side measuring 1cm
- m^2 = a square that has each side measuring 1m

17. To understand and use the formula in words 'length × width' for the area of a rectangle

Steps to Success

1. Multiply the length by the width (l x w)
2. Write you answer using units squared e.g. cm^2

Top Tips

Area is the amount of surface covered by a flat shape.
cm^2 = a square that has each side measuring 1cm
m^2 = a square that has each side measuring 1m

18. To recognise parallel and perpendicular lines

Top Tips

Para**ll**el is like train tracks (double ll in parallel)

Parallel lines can go on forever and always stay the same distance apart and never touch

The symbol for British Rail is like a train track and using the mathematical symbol for parallel

Perpendicular is where two lines meets at right angles

19. To describe the properties of rectangles

Top Tips

- Rect = right   angle = angle
- 2D shape
- 4 sides (so it is also a quadrilateral)
- All angles are right angles (therefore adjacent sides are perpendicular)
- Opposite sides are parallel (so it is also a parallelogram)
- Opposite sides are equal in length
- Diagonals bisect each other (cut each other in half)
- A square is a special rectangle

20. To use all four operations to solve word problems involving measures

Steps to Success

1. **R**ead and understand the problem.
2. **U**nderline key information.
3. **D**ecide what you need to work out (*which operation?*).
4. **E**stimate

5. **C**alculate
6. **A**nswer in a sentence.
7. **T**ake time to check your answer.

Top Tips

There are three types of metric measures length, mass and volume (capacity). Each one has a base unit:

Length = metre
Mass = grams
Volume = litres

Each type of metric unit has smaller and larger units which are either 10, 100, 100- times smaller or larger. The size of the unit compared to the base unit is shown by adding a prefix.

Deci = 1/10 of the base unit (10 times smaller)
Centi = 1/100 of the base unit (100 times smaller)
Milli = 1/1000 of the base unit (1000 times smaller)
Kilo = 1000 time larger than the base unit

21. To use all four operations to solve word problems involving money

Steps to Success

1. **R**ead and understand the problem.
2. **U**nderline key information.
3. **D**ecide what you need to work out (*which operation?*).
4. **E**stimate

5. **C**alculate
6. **A**nswer in a sentence.
7. **T**ake time to check your answer.

Top Tips

Answers to problems involving money always need to be written with 2 decimal places. If you are using a calculator and the answer is 1.5 you need to add a 0 on the end so it's £1.50

22. To use all four operations to solve word problems involving time

Steps to Success

1. **R**ead and understand the problem.
2. **U**nderline key information.
3. **D**ecide what you need to work out (*which operation?*).
4. **E**stimate

5. **C**alculate
6. **A**nswer in a sentence.
7. **T**ake time to check your answer.

Top Tips

am means morning – it runs from 12 midnight to 12 noon

pm means afternoon and evening – it runs from12 noon to 12 midnight

12 noon is pm and 12 midnight is am

The 24 hour clock always has 4 digits and does NOT need a am or a pm. The 24 hour time is the same as the 12 hour clock in the morning except it has a 0 in front. You need to add 12 hours is it's the afternoon.

Remember to calculate in 60's not 100's. Practice addition bonds to 60 and practice counting in intervals of 5.

Many children will need apparatus to calculate time problems.