

## FRACTIONS

Multiply simple pairs of proper fractions writing the answer in its simplest form eg.  $\frac{1}{4} \times \frac{1}{2} =$



Fold paper into size of first fraction eg.  $\frac{1}{4}$ . Colour one quarter yellow. Then fold one one quarter (yellow part) to show second fraction ( $\frac{1}{2}$ ). Colour this part orange. Orange part is answer, eg.  $\frac{1}{8}$

Divide proper fractions by whole numbers eg.  $\frac{1}{3} \div 2 =$



Fold

paper into size of first fraction eg.  $\frac{1}{3}$ . Colour first fraction (eg.  $\frac{1}{3}$  yellow). Then fold one third (yellow part) into number of parts show by whole number (dividing by 2 is halving). Colour this part orange. Orange part is answer, eg.  $\frac{1}{6}$

# Year 6

## A Parent's Guide to Maths Calculations



## SUBTRACTION

### S11d: Column Subtraction

$$\begin{array}{r} \overset{3}{4} \overset{11}{2} \overset{11}{2} \overset{12}{3} \overset{1}{1} \\ - 27358 \\ \hline 14873 \end{array}$$

Subtract numbers with 5 digits. Start from units / ones. Where number at top is less than number at bottom, exchange from next column on left.

### S11e: Column Subtraction

$$\begin{array}{r} \overset{3}{7} \overset{1}{4} \overset{7}{2} \overset{12}{8} \overset{1}{3} \overset{1}{1} \\ - 427358 \\ \hline 315473 \end{array}$$

Subtract numbers with 6 digits. Start from units / ones. Where number at top is less than number at bottom, exchange from next column on left.

### S11f: Column Subtraction

$$\begin{array}{r} \overset{10}{1} \overset{1}{3} \overset{1}{4} \\ - 8.7 \\ \hline 4.7 \end{array}$$

Subtract numbers with 1 decimal place (tenths). Start from right hand side. Where number at top is less than number at bottom, exchange from next column on left.

### S11g: Column Subtraction

$$\begin{array}{r} \overset{6}{7} \overset{11}{2} \overset{13}{4} \overset{1}{3} \\ - 47.85 \\ \hline 24.58 \end{array}$$

Subtract numbers with 2 decimal place (tenths and hundredths). Start from right hand side. Where number at top is less than number at bottom, exchange from next column on left.

## MULTIPLICATION

### M9d: Long Multiplication

$$\begin{array}{r} \text{T U } \cdot \frac{1}{10} \\ 3.6 \\ \times 4 \\ \hline 2.4 \quad (4 \times 0.6) \\ + 12.0 \quad (4 \times 3) \\ \hline 14.4 \end{array}$$

Multiply 1-digit number by number with one decimal place (tenths). Multiply units by tenths and units. Add digits in tenths and units columns.

### M9e: Long Multiplication

$$\begin{array}{r} \text{T U } \cdot \frac{1}{10} \\ 27.2 \\ \times 3 \\ \hline 0.6 \quad (3 \times 0.2) \\ 21.0 \quad (3 \times 7) \\ + 60.0 \quad (3 \times 20) \\ \hline 141.6 \end{array}$$

Multiply 1-digit number by number with one decimal place (tenths). Multiply units by tenths, units, and tens. Add digits in tenths, units and tens columns.

### M9f: Long Multiplication

$$\begin{array}{r} \text{T U } \cdot \frac{1}{10} \\ 24.3 \\ \times 2.5 \\ \hline 0.15 \quad (0.5 \times 0.3) \\ 2.00 \quad (0.5 \times 4) \\ 10.00 \quad (0.5 \times 20) \\ 0.60 \quad (2 \times 0.3) \\ 8.00 \quad (2 \times 4) \\ + 40.00 \quad (2 \times 20) \\ \hline 60.75 \end{array}$$

Multiply numbers with 1 decimal place (tenths). Multiply tenths in second number by tenths, units and tens in first number. Then multiply units of second number by tenths, units, and tens of first number. Add digits in hundredths, tenths, units and tens columns.

### M9g: Long Multiplication

$$\begin{array}{r} \text{HTU} \\ 3786 \\ \times 48 \\ \hline 48 \quad (8 \times 6) \\ 640 \quad (8 \times 80) \\ 5600 \quad (8 \times 700) \\ 24000 \quad (8 \times 3000) \\ 240 \quad (40 \times 6) \\ 3200 \quad (40 \times 80) \\ 28000 \quad (40 \times 700) \\ 120000 \quad (40 \times 3000) \\ \hline 181728 \end{array}$$

Multiply 2-digit number by 4-digit number. Multiply units of 2-digit number by each digit of first number. Then multiply tens of 2-digit number by each digit of first number. Add digits in columns, starting at right hand side

## FRACTIONS

New National Curriculum 2014

By the end of Year 6, most children should be able to these key things:

- Use negative numbers to calculate intervals across zero
- Divide numbers using long division, interpreting the remainders as appropriate
- Use order of operations to carry out calculations
- Use common factors to simplify fractions
- Compare and order fractions of any size
- Add and subtract fractions with different denominators and mixed numbers
- Multiply simple pairs of proper fractions
- Divide proper fractions by whole numbers
- Calculate decimal fraction equivalents for simple fractions
- Multiply a number with up to two decimal places by whole numbers
- Use written division with answers of up to two decimal places
- Solve problems involving the calculation of percentages
- Recall and use equivalences between fractions, decimals and percentages
- Solve problems using ratio using multiplication and division facts
- Solve problems involving similar shapes where the scale factor is known
- Solve problems involving proportion, using knowledge of fractions and multiples
- Use simple formulae

Add two fractions, using array method

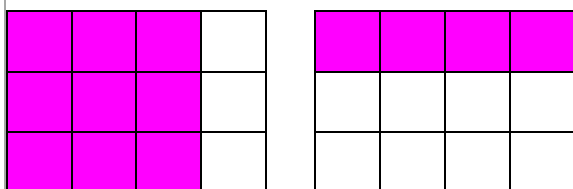
$$1/3 + 1/2 = ?$$



Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Find an array which can show  $1/3$  and  $1/2$  ( $3 \times 2$  array). Then count all shaded squares, eg.  $1/3 + 1/2$  becomes  $2/6$  and  $3/6 = 5/6$

Subtract two fractions, using array method

$$3/4 - 1/3 = ?$$



Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Find an array which can show quarters and thirds so  $4 \times 3$  array of 12 squares. Draw this twice. Shade  $3/4$  on one array and  $1/3$  on the other.  $3/4$  of 12 is 9 so  $9/12$ .  $1/3$  of 12 is 4 so  $4/12$ . So  $9/12 - 4/12$  is  $5/12$ .

## DIVISION continued

New National Curriculum 2014 (continued)

By the end of Year 6, most children should be able to these key things:

- Generate and describe linear number sequences
- Express missing number problems algebraically
- Convert units of measure between smaller and larger units
- Convert between miles and kilometres
- Calculate the area of parallelograms and triangles
- Calculate and compare volume of cubes and cuboids
- Illustrate and name parts of a circle
- Finding missing angles in triangles, quadrilaterals and regular polygons
- Recognise vertically opposite angles and find missing angles
- Describe positions on the full co-ordinate grid
- Translate shapes on a co-ordinate grid and reflect in the axes
- Construct and interpret pie charts
- Calculate the mean as an average

**D13j: Long Division**  
Chunking Method

$$\begin{array}{r}
 37 \overline{) 983} \\
 \underline{- 370} \quad (10) \times 37 \\
 613 \\
 \underline{- 370} \quad (10) \times 37 \\
 243 \\
 \underline{- 222} \quad (6) \times 37 \\
 21
 \end{array}
 \qquad
 983 \div 37 = 26r21$$

3-digit number divided by 2-digit number. Read calculation as 'How many 37s in 983?' Use times table facts to subtract 'chunks', ie.  $10 \times 37 = 370$ . Repeat, subtracting 'chunks' of 37. Record any remainder.

**D13: Long Division**  
Chunking Method

$$\begin{array}{r}
 37 \overline{) 983} \\
 \underline{- 740} \quad (20) \times 37 \\
 243 \\
 \underline{- 222} \quad (6) \times 37 \\
 21
 \end{array}
 \qquad
 983 \div 37 = 26r21$$

3-digit number divided by 2-digit number. Read calculation as 'How many 37s in 983?' Use times table facts to subtract biggest known 'chunk', ie.  $2 \times 37$  is 740 so  $20 \times 37 = 740$ . Repeat, subtracting 'chunks' of 37. Record any remainder.

**D12: Long Division**  
Short Division Method

$$\begin{array}{r}
 37 \overline{) 983} \\
 \underline{9 \quad 24} \\
 26r21
 \end{array}$$

3-digit number divided by 2-digit number. Read calculation as 'How many 37s in 983?' How many 37s in 9? 0. Move 9 to tens column. How many 37s in 98?  $2 \times 37 = 74$  with a remainder of 24. Move 24 to units. How many 37s in 243?  $6 \times 37 = 222$  with a remainder of 21.

# DIVISION

**D11g2: Chunking** Long Division

$$\begin{array}{r}
 32 \\
 15 \overline{)480} \\
 \underline{-150} \quad (10) \times 15 \\
 330 \\
 \underline{-150} \quad (10) \times 15 \\
 180 \\
 \underline{-150} \quad (10) \times 15 \\
 30 \\
 \underline{-30} \quad (10) \times 15 \\
 0
 \end{array}$$

$480 \div 15 = 32$

3-digit number divided by 2-digit number. Read calculation as 'How many 15s in 480?' Use times table facts to subtract 'chunks', ie.  $10 \times 15 = 150$ . Repeat. Count how many chunks of 15.

**D11g1: Chunking** Long Division

$$\begin{array}{r}
 32 \\
 15 \overline{)480} \\
 \underline{-450} \quad (30) \times 15 \\
 30 \\
 \underline{-30} \quad (2) \times 15 \\
 0
 \end{array}$$

$480 \div 15 = 32$

3-digit numbers divided by 2-digit number. Read calculation as 'How many 15s in 480?' Use times table facts to subtract 'chunks', ie.  $3 \times 15 = 45$ , so  $30 \times 15 = 450$ . Work out last 'chunk' to subtract, ie.  $2 \times 15 = 30$ .  $32 \times 15 = 480$ .

**D10i: Short Division**

$$87.5 \div 7 = 12.5$$

$$\begin{array}{r}
 12.5 \\
 7 \overline{)87.5} \\
 \underline{7} \phantom{0} \\
 17 \\
 \underline{14} \\
 35 \\
 \underline{35} \\
 0
 \end{array}$$

Number with 1 decimal place divided by 1-digit number. Read calculation as 'How many 7s in 87.5?' How many 7s in 8? 1 with a remainder of 1. Move 1 to units column. How many 7s in 17?  $2 \times 7 = 14$  with a remainder of 3. Move 3 to tenths. How many 7s in 35?  $5 \times 7 = 35$ .

# ADDITION (Same methods as Year 5)

**A7e: Column Addition**

$$\begin{array}{r}
 787567 \\
 + 446278 \\
 \hline
 1233845
 \end{array}$$

Add two 6-digit numbers. Add digits in each column, starting from right hand side with units / ones. Show carrying / regrouping underneath.

**A7h: Column Addition**

$$\begin{array}{r}
 \begin{array}{c} 10 \quad 1 \quad \frac{1}{10} \\ 76.7 \\ + 58.5 \\ \hline 135.2 \end{array}
 \end{array}$$

Add two numbers with one decimal place (tenths). Add tenths, then units / ones, then tens. Show carrying / regrouping underneath.

**A7i: Column Addition** With Money

$$\begin{array}{r}
 \pounds 38.25 \\
 + \pounds 27.46 \\
 \hline
 \pounds 65.71
 \end{array}$$

Add two numbers with 2 decimal places (hundredths and tenths). Add hundredths, then tenths, then units / ones, then tens. Show carrying / regrouping on whole numbers underneath.

**A7h: Column Addition**

$$\begin{array}{r}
 \begin{array}{c} 10 \quad 1 \quad \frac{1}{10} \\ 76.7 \\ + 58.5 \\ \hline 135.2 \end{array}
 \end{array}$$

Add two numbers with one decimal place (tenths). Add tenths, then units / ones, then tens. Show carrying / regrouping underneath.

**A7j: Column Addition** With Decimals

$$73.40 + 5.67 = 79.07$$

**M7a: Column Multiplication**

$$\begin{array}{r} 3647 \\ \times 4 \\ \hline 14588 \end{array}$$