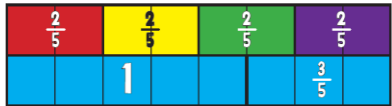



## FRACTIONS

**FK: Calculating with Fractions**  
5×a

$$\frac{2}{5} \times 4 = \frac{8}{5} = 1\frac{3}{5}$$


A Singapore Bar Model showing four bars, each divided into five equal parts. The first bar is red, the second is yellow, the third is green, and the fourth is purple. Each of the first four bars has two parts shaded. Below the bars, a blue bar is divided into five equal parts, with the first four parts shaded blue and the fifth part shaded purple. The number '1' is written in the first four parts, and '3/5' is written in the fifth part.



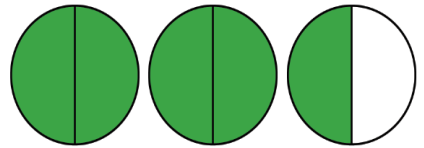
Two pizzas, each divided into five equal parts. The first pizza has two parts shaded red and two parts shaded yellow. The second pizza has two parts shaded green and two parts shaded purple.

Multiply proper fractions and mixed numbers by whole numbers with support. Use Singapore Bar Model - fold 4 paper strips into fifths (or draw 4 bars and split into fifths). Colour  $\frac{2}{5}$  of each paper strip or bar. (You have coloured  $\frac{2}{5}$  of each of the 4 paper strips / bars). Cut off all the shaded fifths and put next to each other. . Every 5 parts make one whole.

**FK: Calculating with Fractions**  
5÷a      Grouping Model - Dividing by a Fraction

$$2\frac{1}{2} \div \frac{1}{2} = 5$$

"How many halves can I fit into a 2 and a half?"  
Answer: 5."



Three pizzas, each divided into two equal parts. The first two pizzas are completely shaded green. The third pizza has one part shaded green and one part white.

Mixed number divided by fraction. How many halves can I fit into 2 and a half? Draw circles / pizzas and split into fraction dividing by.

# Year 5

## A Parent's Guide to Maths Calculations



## SUBTRACTION

### S11d: Column Subtraction

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

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

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

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

$$\begin{array}{r} \overset{10}{6} \overset{1}{7} \overset{1}{2} \overset{1}{4} \overset{1}{3} \\ - 47.85 \\ \hline 24.58 \end{array}$$

Subtract numbers with 2 decimal places (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

### M9a: Long Multiplication

$$\begin{array}{r} \text{TH T U} \\ 56 \\ \times 47 \\ \hline 42 \quad (7 \times 6) \\ 350 \quad (7 \times 50) \\ + 2000 \quad (40 \times 6) \\ \hline 2632 \\ \text{I} \end{array}$$

Multiply two 2-digit numbers. Multiply the units of the second number by each digit in the first number. Multiply the tens of the second number by each digit in the first number. Then add digits in units, tens and hundreds columns.

### M9b: Long Multiplication

$$\begin{array}{r} \text{TH T U} \\ 248 \\ \times 65 \\ \hline 40 \quad (5 \times 8) \\ 200 \quad (5 \times 40) \\ 1000 \quad (5 \times 200) \\ 480 \quad (60 \times 8) \\ 2400 \quad (60 \times 40) \\ + 12000 \quad (60 \times 200) \\ \hline 16120 \\ \text{I} \end{array}$$

Multiply 2-digit number by 3-digit number. Multiply units of 2-digit number by each digit of 3-digit number. Then multiply tens of 2-digit number by each digit of 3-digit number. Finally, add all digits in all columns, starting with units.

### M9c: Long Multiplication

$$\begin{array}{r} \text{TH T U} \\ 203 \\ \times 68 \\ \hline 24 \quad (8 \times 3) \\ 0 \quad (8 \times 0) \\ 1600 \quad (8 \times 200) \\ 180 \quad (60 \times 3) \\ 0 \quad (60 \times 0) \\ + 12000 \quad (60 \times 200) \\ \hline 13804 \\ \text{I} \end{array}$$

Multiply 2-digit number by 3-digit number with 0 as a place holder. Multiply units of 2-digit number by each digit of 3-digit number. Then multiply tens of 2-digit number by each digit of 3-digit number. Finally, add all digits in all columns, starting with units.

## FRACTIONS

**FK: Calculating with Fractions**  
5+

$$\frac{1}{4} + \frac{5}{8} = \frac{2}{8} + \frac{5}{8} = \frac{7}{8}$$

Add fractions with denominators that are multiples of the same number. Use times table facts to find equivalent fraction ( $\frac{1}{4}$  is same as  $\frac{2}{8}$ ). Add numerators. (Numerator is number at top, denominator is number at bottom)

**FK: Calculating with Fractions**  
5-

$$\frac{9}{10} - \frac{3}{5} = \frac{3}{10}$$

Subtract fractions with denominators that are multiples of the same number. Find equivalent fraction so that both have same denominator to enable subtraction.

New National Curriculum 2014

By the end of Year 5, most children should be able to these key things:

- Interpret negative numbers in context
- Read Roman numerals to 1000, including years
- Recognise and use square and cube numbers, and know the notation
- Use rounding to check answers and determine accuracy
- Identify multiples and factors, including finding factor pairs and common factors
- Use vocabulary: prime numbers, prime factors and composite numbers
- Know prime numbers up to 19
- Multiply and divide numbers by 10, 100 or 1000, including decimals
- Use long multiplication for multiplying numbers of up to 4 digits by one or two digits
- Divide numbers using standard written short division
- Convert between mixed numbers and improper fractions
- Compare and order fractions whose denominators are multiples of the same number
- Identify, name and write equivalent fractions including tenths and hundredths
- Add and subtract fractions with denominators that are multiples of the same number
- Multiply proper fractions and mixed numbers by whole numbers with support

## ADDITION

### A7e: Column Addition

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

Add two 6-digit numbers. Add units / ones, then tens, hundreds, thousands, ten thousands, and hundred thousands. Show carrying / regrouping of tens or hundreds underneath.

### A7f: Column Addition

$$\begin{array}{r} 1 \cdot \frac{1}{10} \\ 4.8 \\ + 3.8 \\ \hline 8.6 \\ \hline \end{array}$$

Add two numbers with one decimal place (tenths). Add tenths, showing carrying / regrouping on whole numbers underneath. Add units / ones

### A7g: Column Addition

$$\begin{array}{r} 1 \cdot \frac{1}{10} \quad \frac{1}{100} \\ 5.65 \\ + 3.29 \\ \hline 8.94 \\ \hline \end{array}$$

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

## DIVISION continued

### D11f: Chunking

$$\begin{array}{r} 169r1 \\ 5 \overline{)846} \\ - 500 \text{ (100) } \times 5 \\ \hline 346 \\ - 300 \text{ (60) } \times 5 \\ \hline 46 \\ - 45 \text{ (9) } \times 5 \\ \hline 1 \end{array}$$

Mega Chunk

$846 + 5 = 169r1$

3-digit numbers divided by 1-digit. Read calculation as 'How many 5s in 846?' Try to subtract a 'mega chunk' (100 x number dividing by). Then subtract chunks.  $169 \times 5 = 845$  with a remainder of 1.

### D11e: Chunking

$$\begin{array}{r} 854 \\ 7 \overline{)5978} \\ - 5600 \text{ (800) } \times 7 \\ \hline 378 \\ - 350 \text{ (50) } \times 7 \\ \hline 28 \\ - 28 \text{ (4) } \times 7 \\ \hline 0 \end{array}$$

Mega Chunk

$5978 + 7 = 854$

4-digit numbers divided by 1-digit. Read calculation as 'How many 7s in 5978?' Try to subtract a 'mega chunk' using times table facts ( $8 \times 7 = 56$  so  $800 \times 7 = 5600$ ). Then subtract chunks.

### D10e: Short Division

$$5978 + 7 = 854$$

$$\begin{array}{r} 854 \\ 7 \overline{)5978} \end{array}$$

4-digit numbers divided by 1-digit. Read calculation as 'How many 7s in 5978?' How many 7s in 5? 0. Move 5 to hundreds column. How many 7s in 59?  $8 \times 7 = 56$  with remainder of 3. Move 3 to tens column. How many 7s in 37?  $5 \times 7 = 35$  with a remainder of 2. Move 2 to units. How many 7s in 27?  $4 \times 7 = 28$ .

### D10f: Short Division

$$\begin{array}{r} 169.2 \\ 5 \overline{)846.0} \end{array}$$

Different Remainders

$$\begin{array}{r} 169r1 \\ 5 \overline{)846} \end{array}$$

$$\begin{array}{r} 169 \frac{1}{5} \\ 5 \overline{)846} \end{array}$$

The remainder to a division calculation will need to be written in different ways, according to the context of a word problem, ie. As a decimal, whole number or fraction. If the problem was 864 eggs being packed into boxes of 5, it would have to be a remainder of 1 egg, rather than 0.2 eggs or  $\frac{1}{5}$  of an egg.

## DIVISION

### D11c: **Chunking**

Remainders

$$\begin{array}{r}
 65r4 \\
 6 \overline{)394} \\
 \underline{-360} \quad (60) \times 6 \\
 34 \\
 \underline{-30} \quad (5) \times 6 \\
 4 \\
 394 + 6 = 65r4
 \end{array}$$

3-digit numbers divided by 1-digit. Read calculation as 'How many 6s in 394?' Use times table facts to subtract 'chunks', ie.  $6 \times 6 = 36$ , so  $60 \times 6 = 360$ . Work out last 'chunk' to subtract, ie.  $5 \times 6$ .  $65 \times 6 = 390$  with a remainder of 4.

### D10c: **Short Division**

$$394 + 6 = 65r4$$

$$\begin{array}{r}
 65r4 \\
 6 \overline{)394}
 \end{array}$$

3-digit numbers divided by 1-digit. Read calculation as 'How many 6s in 394?' How many 6s in 3? 0. Move to tens column. How many 6s in 39?  $6 \times 6 = 36$  with a remainder of 3. Move 3 to units. How many 6s in 34?  $6 \times 5 = 30$  with remainder of 4

### D11d: **Chunking**

Mega Chunk

$$\begin{array}{r}
 197 \\
 3 \overline{)591} \\
 \underline{-300} \quad (100) \times 3 \\
 291 \\
 \underline{-270} \quad (90) \times 3 \\
 21 \\
 \underline{-21} \quad (7) \times 3 \\
 0 \\
 591 + 3 = 197
 \end{array}$$

3-digit numbers divided by 1-digit. Read calculation as 'How many 3s in 591?' Try to subtract a 'mega chunk' (100 x number dividing by). Then subtract chunks

### D10d: **Short Division**

$$591 + 3 = 197$$

$$\begin{array}{r}
 197 \\
 3 \overline{)591}
 \end{array}$$

Read calculation as 'How many 3s in 591?' How many 3s in 5? 1 with a remainder of 2. Move 2 to tens column. How many 3s in 29?  $9 \times 3 = 27$  with a remainder of 2. Move 2 to units. How many 3s in 21?  $7 \times 3 = 21$

## ADDITION continued

### A7h: **Column Addition**

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

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

### A7i: **Column Addition**

With Money

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

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.

### A7j: **Column Addition**

With Decimals

$$\begin{array}{r}
 73.40 + 5.67 = 79.07 \\
 10 \quad 1 \quad \frac{1}{10} \quad \frac{1}{100} \\
 73.40 \\
 + 5.67 \\
 \hline
 79.07
 \end{array}$$

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. Encourage children to think of money amounts, eg.  $\text{£}73.40 + \text{£}5.67$

**M7: Column Multiplication**

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