# Fractions – 28.03.19

**Y3 - Number - fractions**

Pupils should be taught to:

count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10

recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators

recognise and show, using diagrams, equivalent fractions with small denominators

add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ]

compare and order unit fractions, and fractions with the same denominators

solve problems that involve all of the above

**Y4 - Number - fractions (including decimals)**
**Pupils should be taught to:**

**recognise and show, using diagrams, families of common equivalent fractions**
**count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10**
**solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number**
**add and subtract fractions with the same denominator**
**recognise and write decimal equivalents of any number of tenths or hundreds**
**recognise and write decimal equivalents to 1/4 , 1/2 , 3/4**

**find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths**
**round decimals with 1 decimal place to the nearest whole number**
**compare numbers with the same number of decimal places up to 2 decimal places**
**solve simple measure and money problems involving fractions and decimals to 2 decimal places**

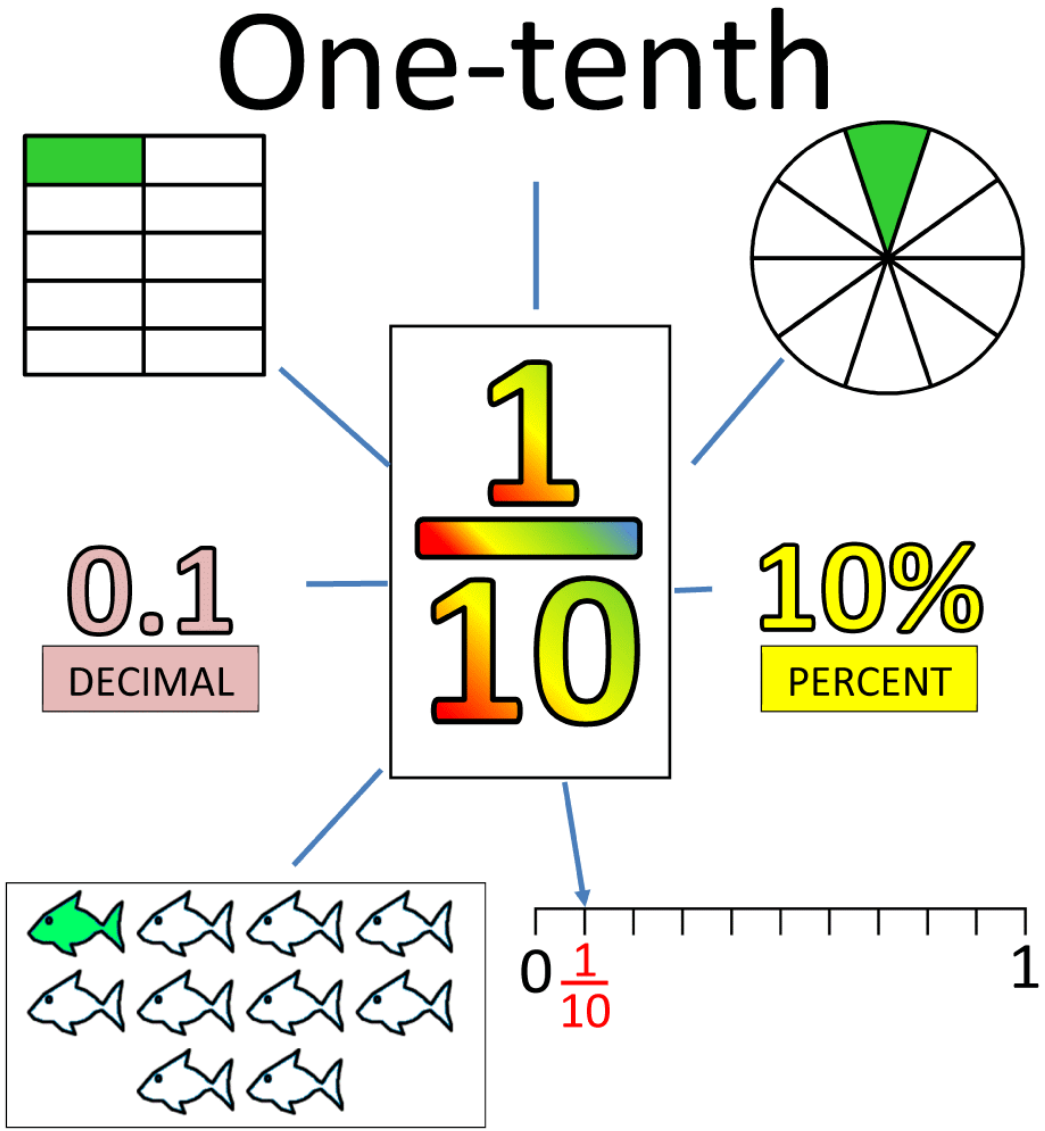
**Y5 - Number - fractions (including decimals and percentages)**
**Pupils should be taught to:**

**compare and order fractions whose denominators are all multiples of the same number**
**identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths**
**recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5 ]**
**add and subtract fractions with the same denominator, and denominators that are multiples of the same number**
**multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams**
**read and write decimal numbers as fractions [for example, 0.71 = 71/100 ]**
**recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents**
**round decimals with 2 decimal places to the nearest whole number and to 1 decimal place**
**read, write, order and compare numbers with up to 3 decimal places**
**solve problems involving number up to 3 decimal places**
**recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction**
**solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25**

**Y6 - Number - Fractions (including decimals and percentages)**
**Pupils should be taught to:**

**use common factors to simplify fractions; use common multiples to express fractions in the same denomination**
**compare and order fractions, including fractions >1**
**add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions**
**multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 × 1/2 = 1/8 ]**
**divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6 ]**
**associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8 ]**
**identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places**
**multiply one-digit numbers with up to 2 decimal places by whole numbers**
**use written division methods in cases where the answer has up to 2 decimal places**
**solve problems which require answers to be rounded to specified degrees of accuracy**
**recall and use equivalences between simple fractions, decimals and percentages, including in different contexts**

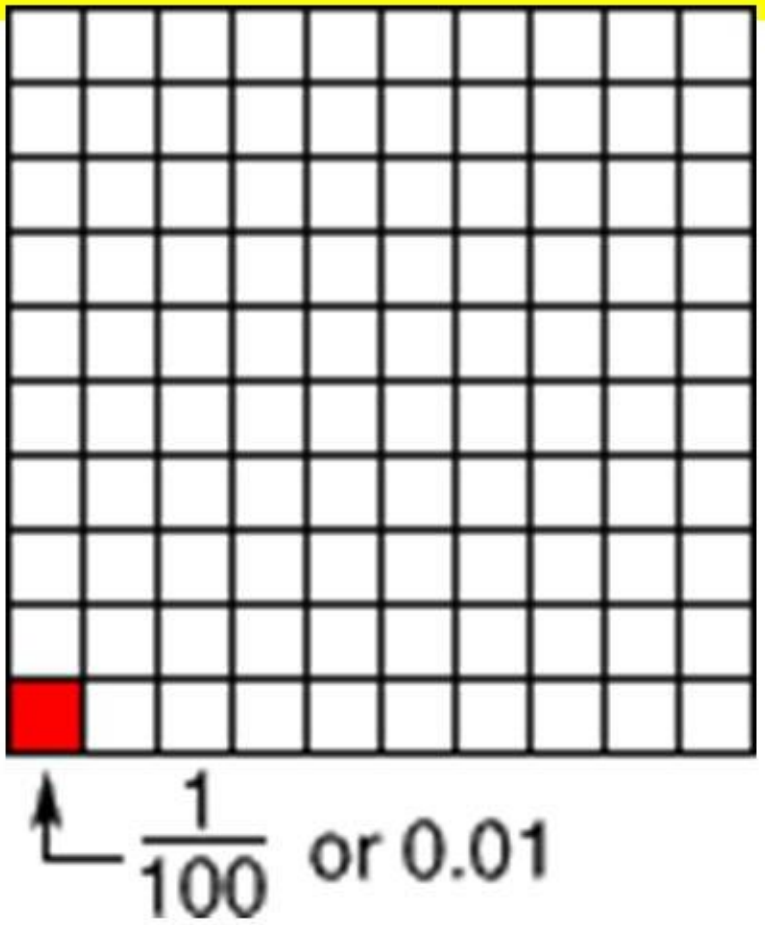
# Counting up and down in tenths



# Counting in one hundredths

- One of one hundred equal parts

***Example:***



# Fraction of amounts

| Challenge 1 | | | |
|---|---|---|---|
| Find $\frac{1}{10}$ of:<br><br>a) 30<br>b) 80<br>c) 20p<br>d) 50p | Find $\frac{1}{5}$ of:<br><br>e) 10<br>f) 30<br>g) 25cm<br>h) 45cm | Find $\frac{1}{3}$ of:<br><br>i) 9<br>j) 27<br>k) £30<br>l) £12 | Find $\frac{1}{4}$ of:<br><br>m) 8<br>n) 32<br>o) 20m<br>p) 36m |

| Challenge 2 | | | | |
|---|---|---|---|---|
| a) $\frac{1}{10}$ of 60 | e) $\frac{1}{5}$ of 50 | i) $\frac{5}{6}$ of 12 | m) $\frac{2}{7}$ of 70p | q) $\frac{5}{6}$ of 30cm |
| b) $\frac{3}{10}$ of 60 | f) $\frac{4}{5}$ of 50 | j) $\frac{2}{5}$ of 35 | n) $\frac{3}{4}$ of 28p | r) $\frac{7}{9}$ of 18cm |
| c) $\frac{1}{4}$ of 16 | g) $\frac{1}{3}$ of 21 | k) $\frac{4}{9}$ of 27 | o) $\frac{5}{8}$ of £16 | s) $\frac{3}{8}$ of 40m |
| d) $\frac{3}{4}$ of 16 | h) $\frac{2}{3}$ of 21 | l) $\frac{7}{10}$ of 90 | p) $\frac{2}{3}$ of £24 | t) $\frac{4}{7}$ of 21m |

| Challenge 3 |
|---|

Circle $\frac{1}{3}$ of the set of objects below.

Circle $\frac{2}{5}$ of the set of objects below.

Circle $\frac{3}{4}$ of the people below.

Deepening Understanding

YR4 Fractions of Amounts

Bar Models

| 20 | | | | |
|---|---|---|---|---|
| $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ |
| 4 | 4 | 4 | 4 | 4 |

I know this bar model tells me that one fifth of 20 is 4.

What other facts does it show?

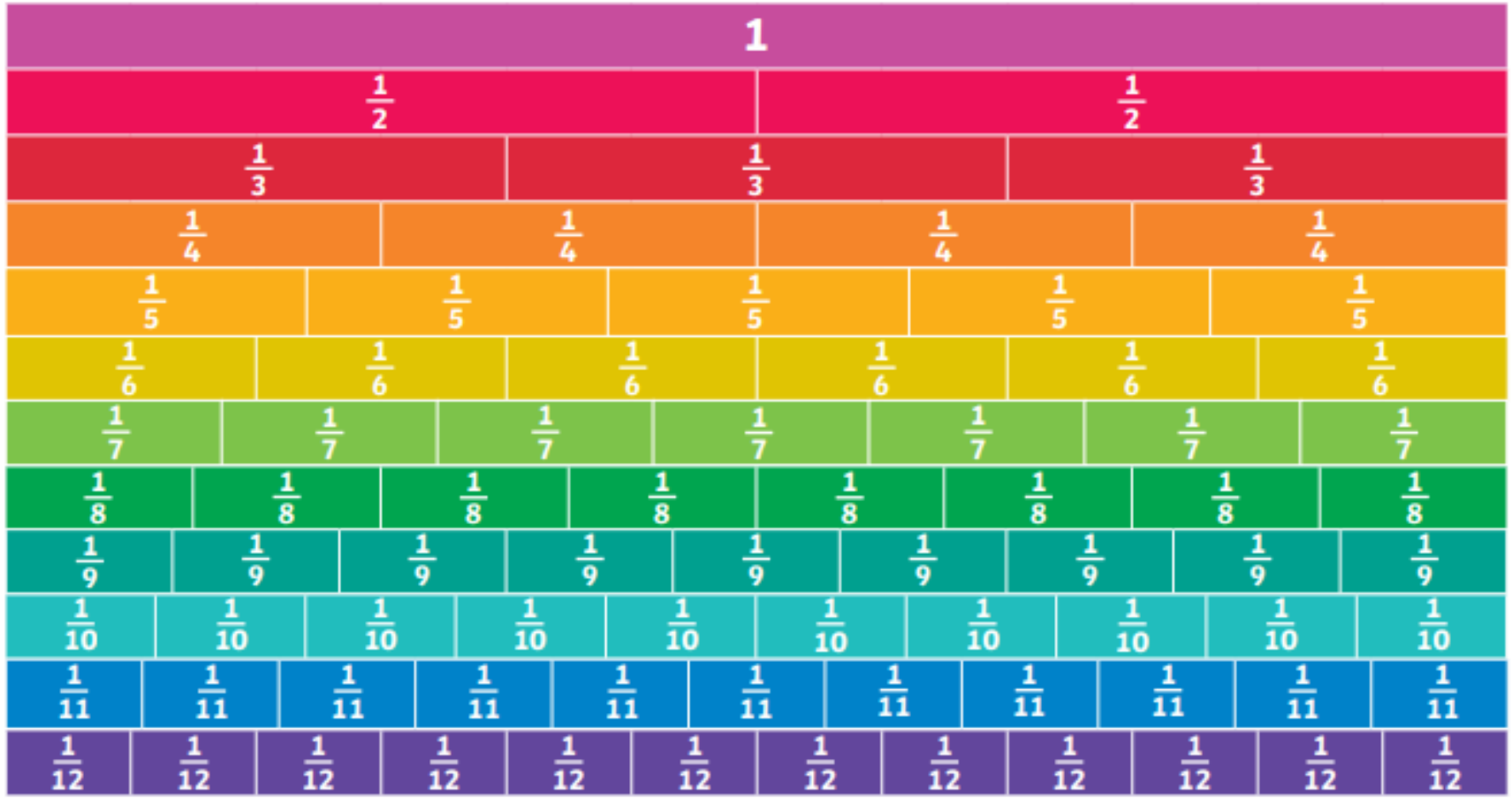
Complete the bar model and write all of the known facts

| 24 | | | |
|---|---|---|---|
| $\frac{1}{4}$ | | | |
| | | | |

Complete the bar model and write all of the known facts

| 27 | | |
|---|---|---|
| | | |
| | | |

# Fractions Wall



# Simplifying Fractions

## **Make Fractions as Small as Possible

$\frac{14}{42} = 1/3$

1. Find the Greatest Common Factor!

14

(7) x (2)

42

7 x 6

1 x (7) x 3 x (2)

Factors that Repeat:

7 x 2 = 14

GCF = 14

Numerator: 14 ÷ 14 = 1

Denominator: 42 ÷ 14 = 3

2. Keep Your Fraction Balanced!!

DIVIDE THE NUMERATOR AND THE DENOMINATOR BY THE GREATEST COMMON FACTOR!

# Addition and subtraction of fractions with the same denominator

1) $\frac{7}{6} + \frac{2}{6} = \frac{9}{6}$

2) $\frac{7}{5} - \frac{4}{5} = \frac{3}{5}$

3) $\frac{9}{10} - \frac{7}{10} = \frac{2}{10}$

4) $\frac{7}{9} + \frac{6}{9} = \frac{13}{9}$

5) $\frac{8}{7} + \frac{6}{7} = \frac{14}{7}$

6) $\frac{11}{4} - \frac{6}{4} = \frac{5}{4}$

7) $\frac{12}{15} + \frac{7}{15} = \frac{19}{15}$

8) $\frac{15}{12} - \frac{4}{12} = \frac{11}{12}$

# Adding Fractions

Change to a mixed number

$$\frac{2}{5} + \frac{3}{4} = \frac{8}{20} + \frac{15}{20} = \frac{23}{20} = 1\frac{3}{20}$$

x 4 x 5

x 4 x 5

Find a
COMMON DENOMINATOR
then you can ADD.

# Subtraction Fractions with UNLIKE denominators

$$\frac{5}{6} - \frac{3}{9} =$$

1. Find the LCM of the denominators. This is your new denominator.

Multiples of 6 = 6, 12, 18
Multiples of 9 = 9, 18, 27

LCM = 18

2. Rewrite the problem using the LCM.

$$\frac{5}{6} \times \frac{3}{3} - \frac{3}{9} \times \frac{2}{2} = \frac{15}{18} - \frac{6}{18}$$

Whatever you do to the numerator you must do to the denominator.

3. Subtract the numerators. The denominator stays the same.

$$\frac{15}{18} - \frac{6}{18} = \frac{9}{18}$$

4. Simplify

$$\frac{9}{18} \div 9 = \frac{1}{2}$$

Divide by the Greatest Common Factor.

# Addition and subtraction of fractions whose denominators are multiples of the same number

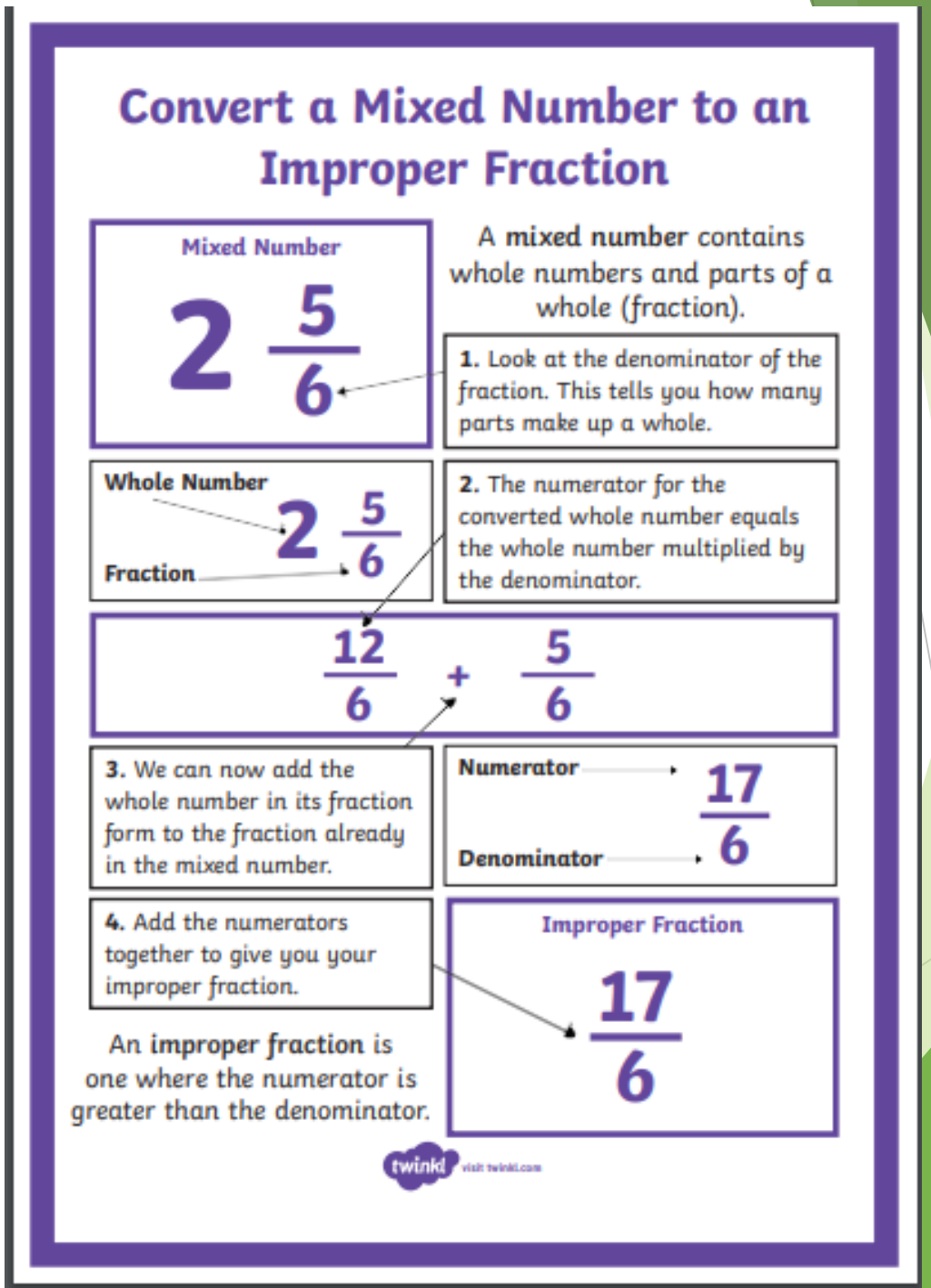
## Adding and subtracting fractions: different denominators 1

1. $\frac{1}{4} + \frac{3}{8} =$
2. $\frac{3}{10} - \frac{1}{5} =$
3. $\frac{2}{9} + \frac{4}{6} =$
4. $\frac{3}{4} - \frac{3}{12} =$
5. $\frac{1}{14} + \frac{3}{7} =$
6. $\frac{6}{21} - \frac{1}{7} =$
7. $\frac{3}{20} + \frac{6}{10} =$
8. $\frac{3}{4} - \frac{1}{16} =$
9. $\frac{5}{9} + \frac{5}{3} =$
10. $\frac{7}{12} - \frac{1}{4} =$

## Adding and subtracting fractions: different denominators 2

11. $\frac{1}{3} + \frac{1}{5} =$
12. $\frac{1}{3} - \frac{1}{8} =$
13. $\frac{2}{7} + \frac{1}{2} =$
14. $\frac{3}{4} - \frac{3}{10} =$
15. $\frac{2}{3} + \frac{3}{7} =$
16. $\frac{6}{11} - \frac{1}{4} =$
17. $\frac{3}{9} + \frac{6}{10} =$
18. $\frac{3}{4} - \frac{5}{11} =$
19. $\frac{5}{6} + \frac{1}{4} =$
20. $\frac{7}{15} - \frac{1}{10} =$

# Recognise mixed and improper fractions



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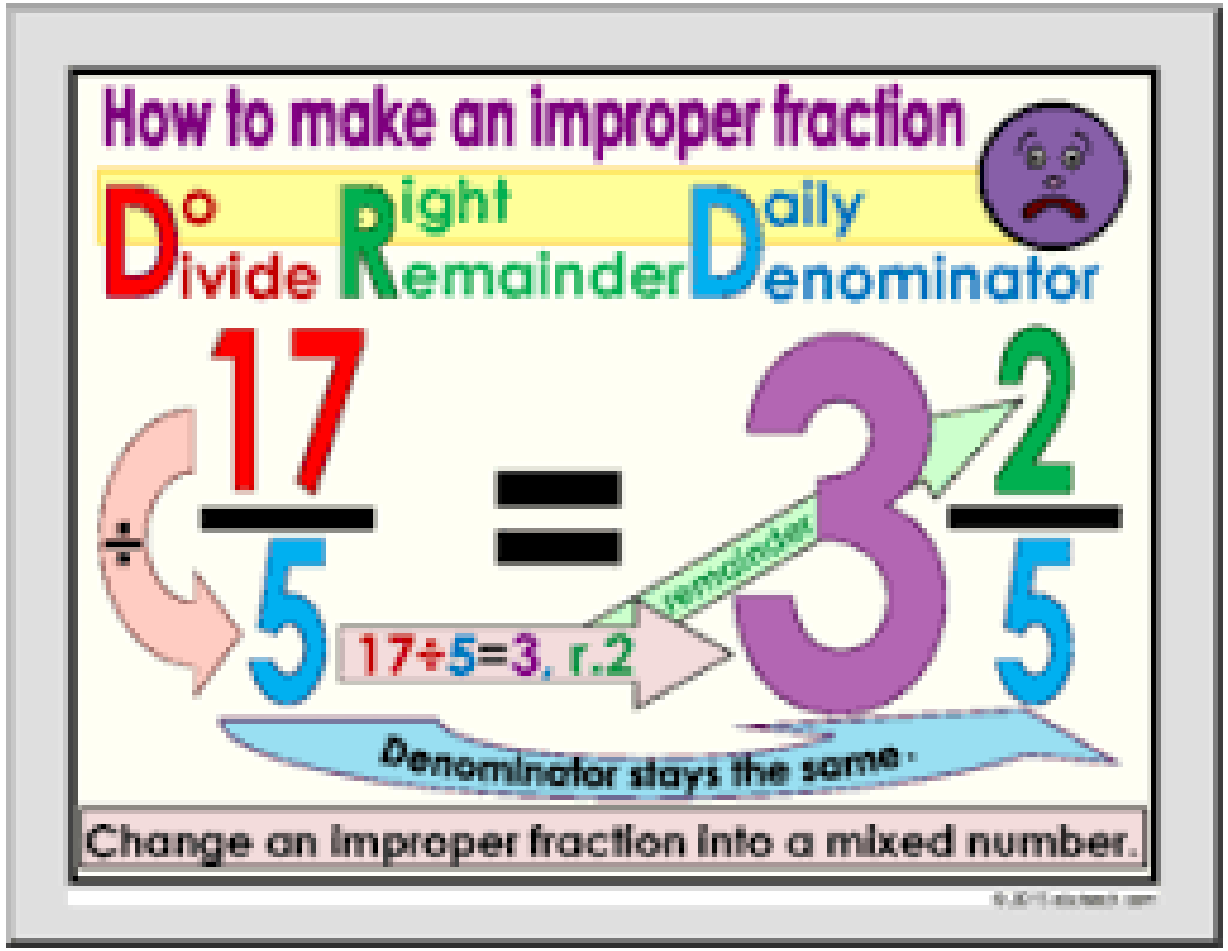
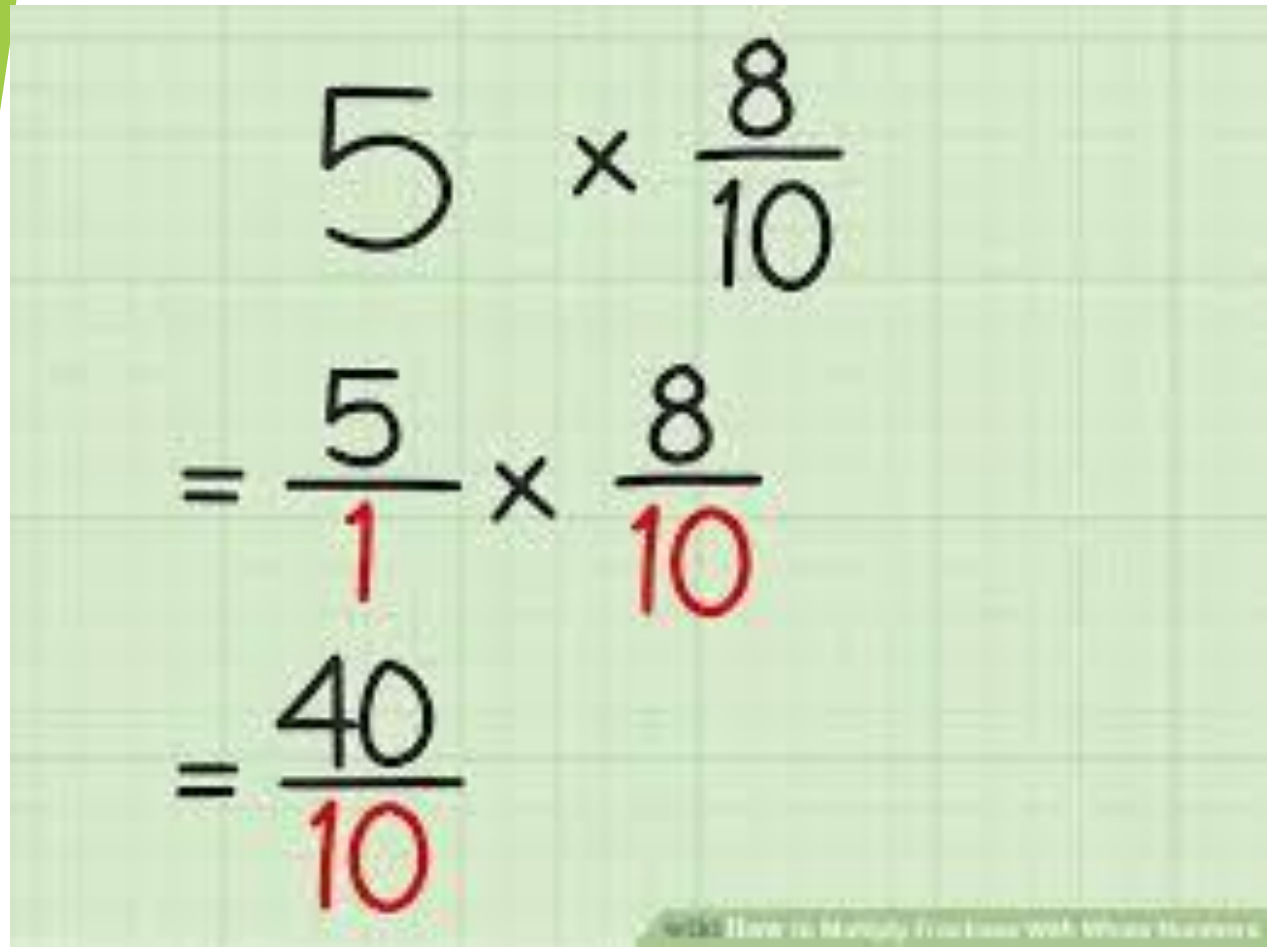
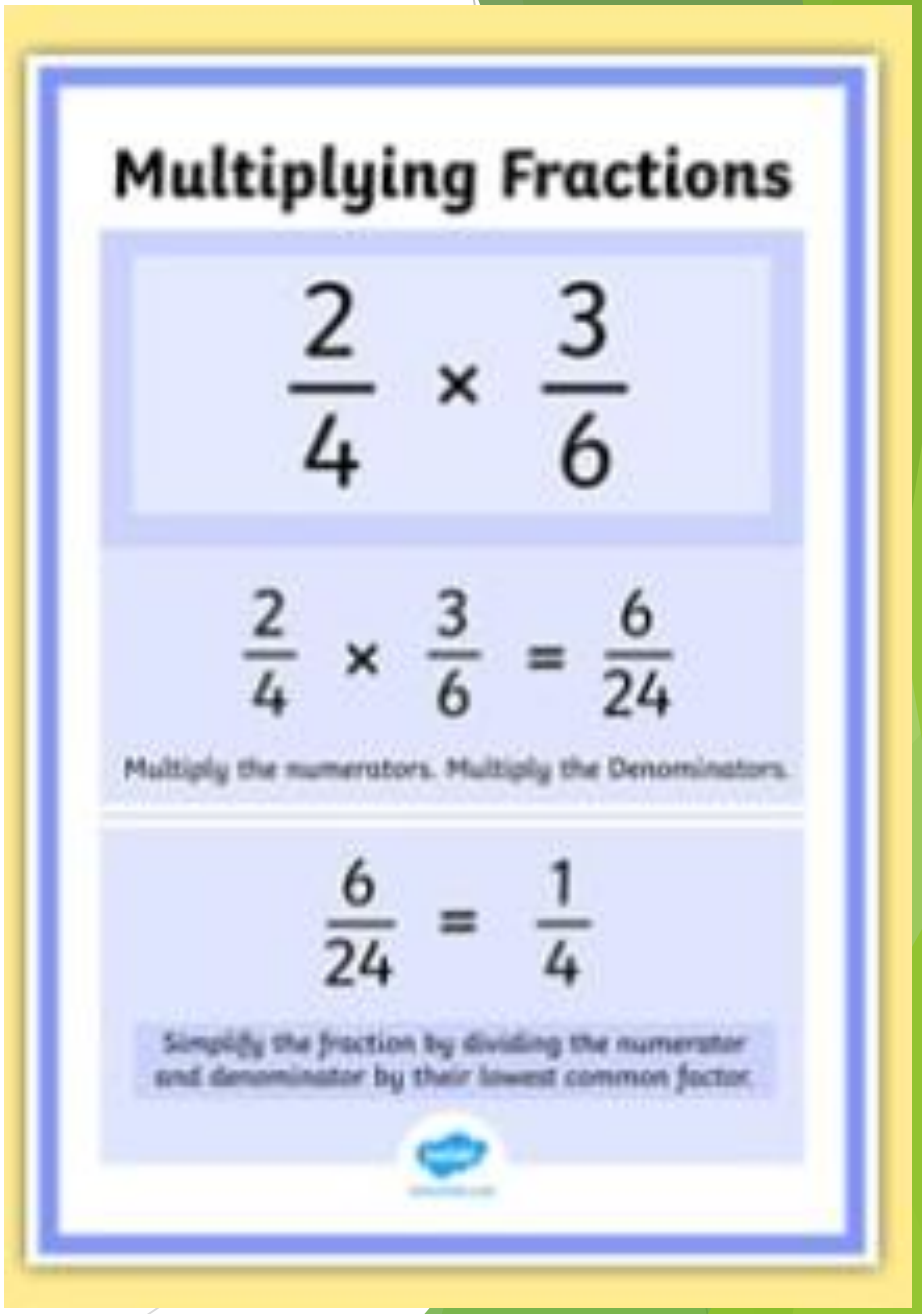


# Multiply fractions



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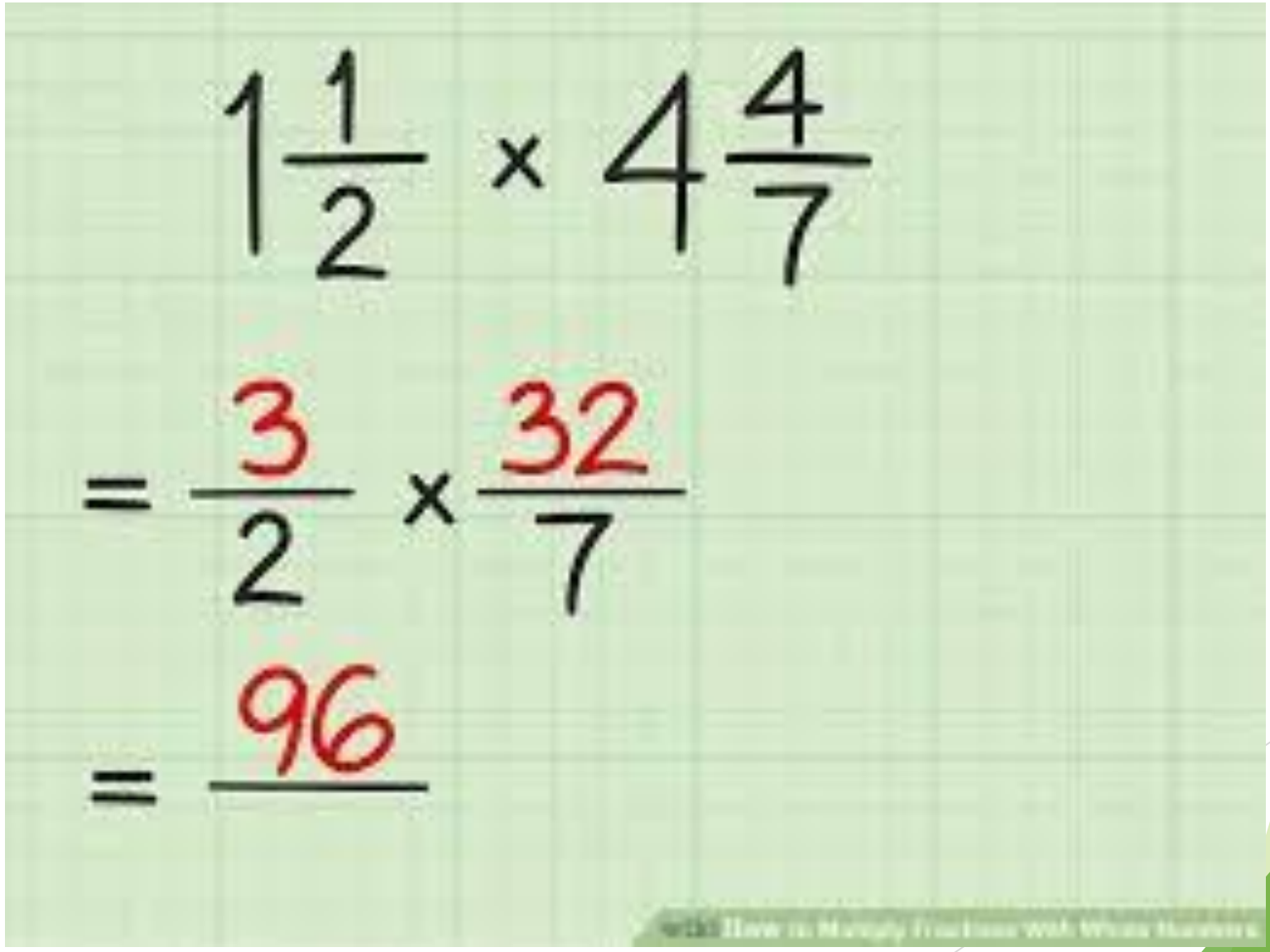

# Divide fractions

$$\frac{9}{17} \div 3 = \frac{9}{17} \div \frac{3}{1} = \frac{9}{17} \times \frac{1}{3} = \frac{9 \times 1}{17 \times 3}$$

$$= \frac{9}{51} = \frac{9 \div 3}{51 \div 3} = \frac{3}{17}$$

*Stack it, Flip it, Kiss it*

# Percentages of amounts