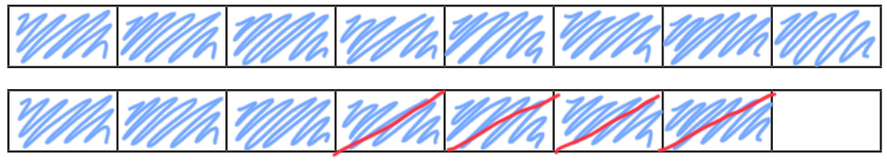
Subtract mixed numbers

1 Complete the subtractions.

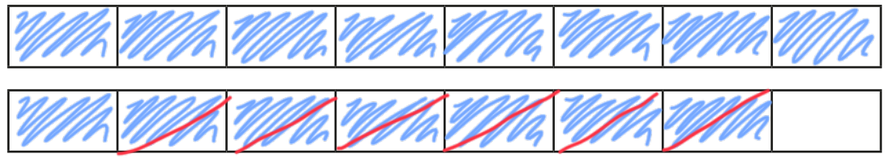
Use the bar models to help you.

a)



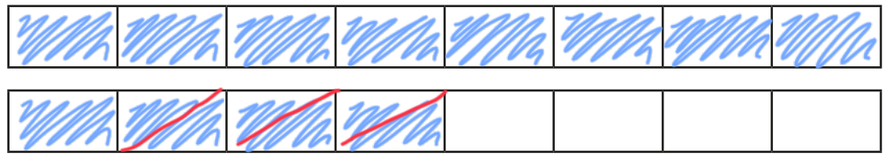
$\frac{15}{8} - \frac{1}{2} =$ $1\frac{3}{8}$

b)



$1\frac{7}{8} - \frac{3}{4} =$ $1\frac{1}{8}$

c)

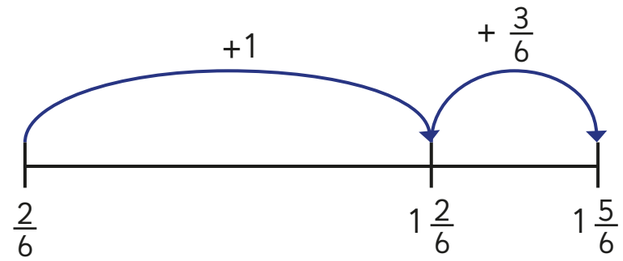


$1\frac{1}{2} - \frac{3}{8} =$ $1\frac{1}{8}$

2 Dexter and Whitney are using number lines to work out $1\frac{5}{6} - \frac{1}{3}$

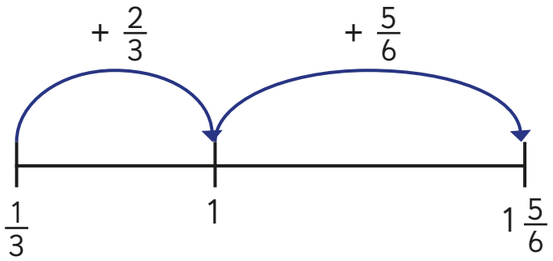
Dexter's method

$\frac{1}{3} = \frac{2}{6}$



$1 + \frac{3}{6} = 1\frac{1}{2}$

Whitney's method



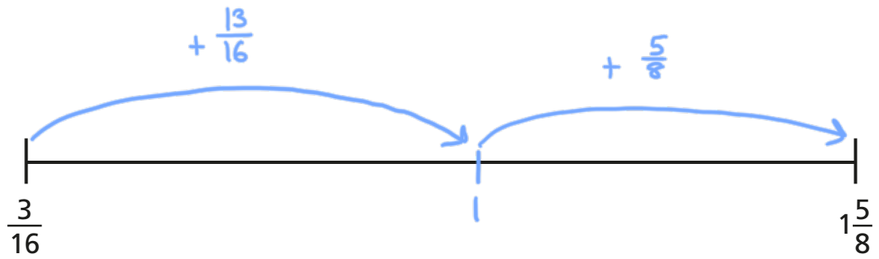
$\frac{2}{3} = \frac{4}{6}$

$\frac{4}{6} + \frac{5}{6} + \frac{9}{6} = 1\frac{1}{2}$

What is the same and what is different about these methods?

Use one of the methods to work out $1\frac{5}{8} - \frac{3}{16}$

e.g



$\frac{13}{16} + \frac{10}{16} = \frac{23}{16} = 1\frac{7}{16}$

$1\frac{5}{8} - \frac{3}{16} =$ $1\frac{7}{16}$

3 Complete the subtractions.

a) $3\frac{1}{4} - \frac{5}{24} =$ $3\frac{1}{24}$

b) $3\frac{3}{16} - \frac{1}{8} =$ $3\frac{1}{16}$

c) $2\frac{5}{6} - \frac{2}{3} =$ $2\frac{1}{6}$

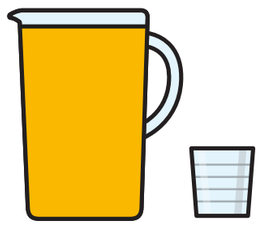
d) $7\frac{5}{6} - \frac{13}{24} =$ $7\frac{7}{24}$

e) $4\frac{4}{9} - \frac{4}{27} =$ $4\frac{8}{27}$

f) $6\frac{11}{12} - \frac{3}{4} =$ $6\frac{1}{6}$

4 A jug contains $1\frac{3}{5}$ litres of orange juice.

Eva pours $\frac{4}{15}$ litres into a glass.



How much orange juice is left in the jug?

There are $1\frac{1}{3}$ litres of orange juice left in the jug.

5 Find three different ways to complete the calculation.

e.g.

$3\frac{1}{5} - \frac{3}{20} = 3\frac{1}{20}$

$3\frac{3}{5} - \frac{11}{20} = 3\frac{1}{20}$

$3\frac{2}{5} - \frac{7}{20} = 3\frac{1}{20}$

Are there any other ways to complete this calculation?

6 Three children take part in throwing competitions.

Here is the table of results.

	Javelin	Shot Put	Discus
Dexter	$15\frac{1}{4}$ m	$7\frac{5}{12}$ m	$12\frac{3}{8}$ m
Amir	$13\frac{3}{8}$ m	$8\frac{1}{4}$ m	$12\frac{7}{8}$ m
Annie	$14\frac{1}{3}$ m	9 m	$11\frac{5}{12}$ m

Use the clues to complete the table.

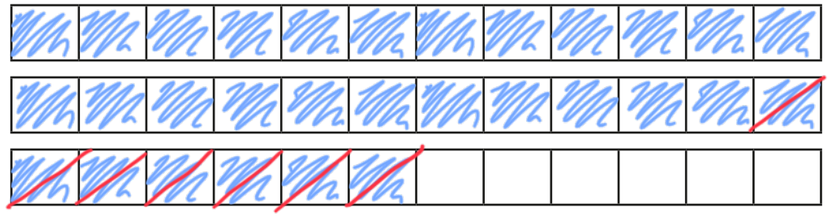
- Annie's javelin throw is $\frac{11}{12}$ m less than Dexter's.
- Amir's shot put throw is $\frac{3}{4}$ m less than Annie's.
- Dexter's discus throw is $\frac{1}{2}$ m less than Amir's

Subtract – breaking the whole

1 Complete the subtractions.

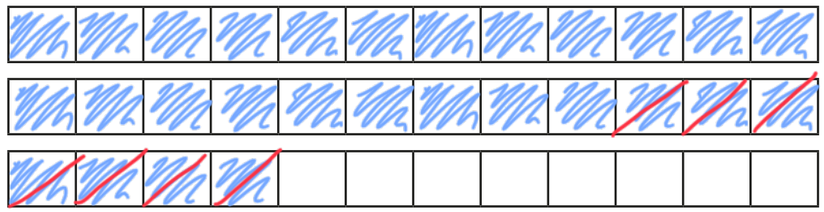
Use the bar models to help you.

a)



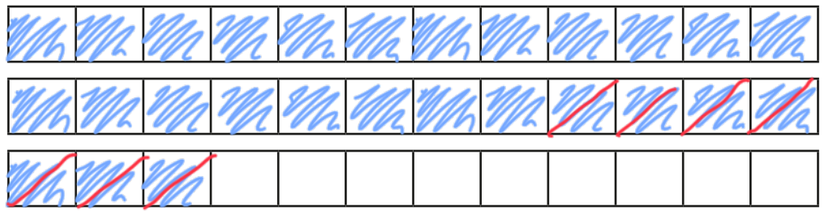
$2\frac{1}{2} - \frac{7}{12} =$ $1\frac{11}{12}$

b)



$2\frac{1}{3} - \frac{7}{12} =$ $1\frac{3}{4}$

c)



$2\frac{1}{4} - \frac{7}{12} =$ $1\frac{2}{3}$

2 **a)** Complete the subtractions.

$3\frac{1}{4} - \frac{1}{8} =$ $3\frac{1}{8}$

$3\frac{1}{4} - \frac{2}{8} =$ 3

$3\frac{1}{4} - \frac{3}{8} =$ $2\frac{7}{8}$

$3\frac{1}{4} - \frac{4}{8} =$ $2\frac{3}{4}$

b) At what point did the answer break the whole? Why?

c) Tick the calculations that will break the whole.

$3\frac{1}{2} - \frac{9}{10}$ ✓ $\quad 7\frac{3}{4} - \frac{1}{8}$ $\quad 6\frac{11}{12} - \frac{2}{3}$ $\quad 4\frac{2}{5} - \frac{7}{15}$ ✓

3 Complete the subtractions.

a) $3\frac{1}{5} - \frac{7}{15} =$ $2\frac{11}{15}$

b) $3\frac{1}{16} - \frac{5}{8} =$ $2\frac{7}{16}$

c) $4\frac{5}{12} - \frac{5}{6} =$ $3\frac{7}{12}$

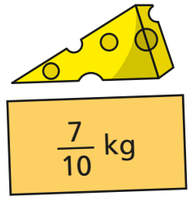
d) $2\frac{1}{6} - \frac{5}{12} =$ $1\frac{3}{4}$

e) $3\frac{2}{9} - \frac{13}{18} =$ $2\frac{1}{2}$

f) $3\frac{4}{9} - \frac{13}{27} =$ $2\frac{26}{27}$

4 Here are some ingredients.

Potatoes



Cheese

Carrots

a) How much more do the carrots weigh than the cheese?

The carrots weigh $\frac{7}{10}$ kg more than the cheese.

b) Jack uses $\frac{17}{20}$ kg of carrots.

How many kilograms of carrots does he have left?

Jack has $\frac{11}{20}$ kg of carrots left.

c) Jack uses all the cheese and the same amount of potatoes.

How much do the leftover potatoes weigh?

The leftover potatoes weigh $1\frac{4}{5}$ kg.

5 Eva is doing the long jump.

On her 1st attempt, she jumps $3\frac{2}{9}$ m.

Her 2nd attempt is $\frac{2}{3}$ m shorter than her first.

How far does Eva jump on her 2nd attempt?

Eva jumps $2\frac{5}{9}$ m on her 2nd attempt.

6 **a)** The difference between a mixed number and a fraction is $\frac{7}{8}$

The fraction has a denominator of 16

What could the mixed number and the fraction be?

Give two possible answers.

e.g.

$1\frac{1}{16}$ and $\frac{3}{16}$ $\quad$ $1\frac{3}{16}$ and $\frac{5}{16}$

b) Talk to a partner about how you could find more answers.

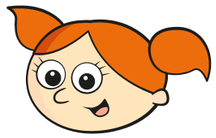
Subtract 2 mixed numbers

1 Amir and Alex are working out $3\frac{1}{2} - 2\frac{1}{4}$

Amir

First subtract 2 from 3,
then subtract $\frac{1}{4}$ from $\frac{1}{2}$
That leaves $1\frac{1}{4}$

Convert to an improper fraction first, $\frac{7}{2} - \frac{9}{4}$, then
$\frac{14}{4} - \frac{9}{4} = \frac{5}{4} = 1\frac{1}{4}$



Alex

Whose method do you prefer?

2 Use your preferred method to complete the subtractions.

a) $4\frac{4}{5} - 2\frac{3}{10} =$ $2\frac{1}{2}$

c) $16\frac{1}{2} - 5\frac{1}{4} =$ $11\frac{1}{4}$

b) $3\frac{5}{8} - 1\frac{1}{4} =$ $2\frac{3}{8}$

d) $10\frac{5}{6} - 5\frac{5}{12} =$ $5\frac{5}{12}$

What do you notice about your answer to part d)?

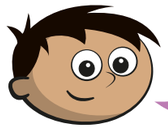
3 Car A travels for $15\frac{1}{4}$ miles.

Car B travels for $21\frac{5}{12}$ miles.

How much further does Car B travel than Car A?

Car B travels $6\frac{1}{6}$ miles further than Car A.

4 Amir and Dora are working out $4\frac{1}{5} - 1\frac{2}{5}$



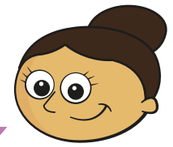
Amir

You can't use my method because you can't do $\frac{1}{5} - \frac{2}{5}$

a) Do you agree with Amir?

b)

I know that $4\frac{1}{5} = 3\frac{6}{5}$



Dora

How does this help you to work out the subtraction?

$\frac{6}{5} - \frac{2}{5} = \frac{4}{5}$

c) Complete the calculation.

$4\frac{1}{5} - 1\frac{2}{5} =$ $2\frac{4}{5}$

5 Complete the subtractions.

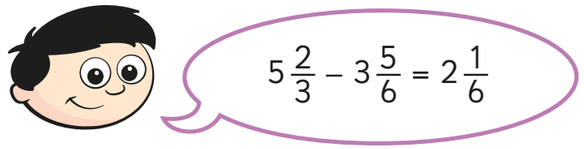
a) $4\frac{4}{5} - 2\frac{9}{10} =$ $1\frac{9}{10}$

c) $5\frac{2}{7} - 2\frac{11}{14} =$ $2\frac{1}{2}$

b) $3\frac{5}{8} - 1\frac{3}{4} =$ $1\frac{7}{8}$

d) $2\frac{1}{6} - 1\frac{7}{18} =$ $\frac{7}{9}$

6 Dexter is subtracting fractions.



Explain the mistake that Dexter has made.

He has found the difference between the wholes $(5-3=2)$ and the difference between the fractions $(\frac{5}{6} - \frac{2}{3} = \frac{1}{6})$ rather than doing $5\frac{2}{3} - 3\frac{5}{6} = 4\frac{5}{3} - 3\frac{5}{6} = 1\frac{5}{6}$

7 Here are some number cards.

$3\frac{1}{12}$	$4\frac{1}{2}$	$2\frac{5}{24}$	$4\frac{5}{6}$

a) Use two of the number cards to find the smallest difference.

$4\frac{5}{6} - 4\frac{1}{3} = \frac{1}{3}$

b) Use two of the number cards to find the difference closest to 2

$4\frac{5}{6} - 3\frac{1}{12} = 1\frac{3}{4}$

8 Complete the magic square.

The total of each column is $5\frac{7}{20}$

The total of each row is $5\frac{7}{20}$

$1\frac{1}{2}$	$1\frac{3}{5}$	$2\frac{1}{4}$
$2\frac{3}{10}$	$1\frac{7}{20}$	$1\frac{7}{10}$
$1\frac{11}{20}$	$2\frac{3}{5}$	$1\frac{2}{5}$

9 A marathon is $26\frac{1}{5}$ miles.

Dexter has run $18\frac{1}{10}$ miles.

Eva has run $19\frac{3}{5}$ miles.

a) How much further has Eva run than Dexter?

$1\frac{1}{2}$ miles

b) How much further does Eva need to run to complete the marathon?

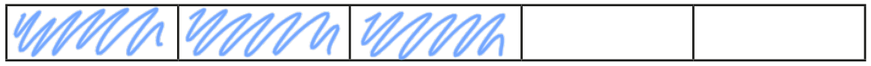
$6\frac{3}{5}$ miles

Multiply unit fractions by an integer

1 Complete the calculations.

Use the bar models to help you.

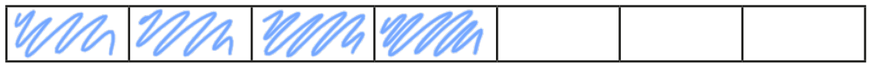
a)



$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \boxed{\frac{3}{5}}$

$3 \times \frac{1}{5} = \boxed{\frac{3}{5}}$

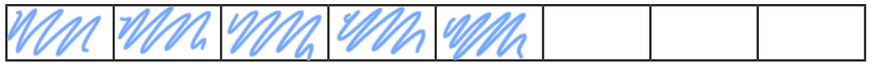
b)



$\frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \boxed{\frac{4}{7}}$

$4 \times \frac{1}{7} = \boxed{\frac{4}{7}}$

c)



$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \boxed{\frac{5}{8}}$

$5 \times \frac{1}{8} = \boxed{\frac{5}{8}}$

d)

$\frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} = \boxed{\frac{7}{10}}$

$7 \times \frac{1}{10} = \boxed{\frac{7}{10}}$

2 Complete the multiplications.

a) $3 \times \frac{1}{8} = \boxed{\frac{3}{8}}$

b) $3 \times \frac{1}{10} = \boxed{\frac{3}{10}}$

c) $\frac{1}{8} \times 5 = \boxed{\frac{5}{8}}$

d) $9 \times \frac{1}{10} = \boxed{\frac{9}{10}}$

e) $\frac{1}{5} \times 4 = \boxed{\frac{4}{5}}$

f) $\frac{1}{9} \times 8 = \boxed{\frac{8}{9}}$

g) $8 \times \frac{1}{11} = \boxed{\frac{8}{11}}$

h) $\frac{1}{11} \times 10 = \boxed{\frac{10}{11}}$

3 Match the addition to the equivalent multiplication.

$\frac{1}{3} + \frac{1}{3}$	$2 \times \frac{1}{5}$
$\frac{1}{5} + \frac{1}{5} + \frac{1}{5}$	$\frac{1}{4} \times 3$
$\frac{1}{5} + \frac{1}{5}$	$3 \times \frac{1}{5}$
$\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$	$2 \times \frac{1}{3}$

4 A pizza is cut into sixths.

Jack eats five of the slices.

Write a multiplication to represent this.

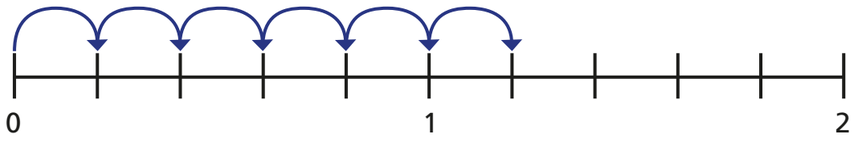
$5 \times \frac{1}{6} = \frac{5}{6}$

5 Complete the multiplications.

Use the number lines to help you.

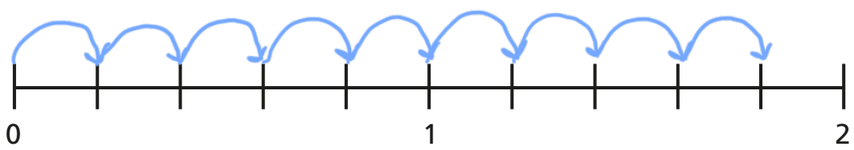
Give each answer as an improper fraction and as a mixed number.

a)



$6 \times \frac{1}{5} = \frac{6}{5} = 1\frac{1}{5}$

b)



$9 \times \frac{1}{5} = \frac{9}{5} = 1\frac{4}{5}$

6 Complete the multiplications.

a) $11 \times \frac{1}{10} = \frac{11}{10} = 1\frac{1}{10}$

b) $11 \times \frac{1}{9} = \frac{11}{9} = 1\frac{2}{9}$

c) $\frac{1}{8} \times 11 = \frac{11}{8} = 1\frac{3}{8}$

d) $11 \times \frac{1}{7} = \frac{11}{7} = 1\frac{4}{7}$

e) $11 \times \frac{1}{6} = \frac{11}{6} = 1\frac{5}{6}$

What do you notice?

Does this pattern continue?

7 Complete the calculations.

a) $2 \times \frac{1}{3} = \frac{2}{3}$

b) $3 \times \frac{1}{3} = 1$

c) $7 \times \frac{1}{7} = 1$

d) $\frac{1}{7} \times 10 = 1\frac{3}{7}$

e) $\frac{1}{8} \times 11 = 1\frac{3}{8}$

f) $7 \times \frac{1}{2} = 3\frac{1}{2}$

g) $10 \times \frac{1}{3} = 3\frac{1}{3}$

h) $\frac{1}{4} \times 13 = 3\frac{1}{4}$