

Prompts for oral and mental starters: phase 3

Where appropriate:

- expect rapid conversion between fractions (lowest terms), decimal fractions, percentages;
- expect rates, which should be clearly stated as '... per ...';
- expect the use of a calculator where numbers are 'awkward'.

Where a proportion is asked for this could be a fraction, a decimal fraction or a percentage.

Expressing proportions

Numbers, first *smaller* than second:

- What is 5 as a fraction of 85?
- What is 5 as a percentage of 85?
- What is 5 as a proportion of 85?

Quantities, first *smaller* than second (answer is not in units, e.g. £):

- What is £3 as a fraction/percentage/proportion of £17?

Quantities (mixed units), first *smaller* than second (answer is not in units, e.g. £ or p):

- What is 60p as a fraction/percentage/proportion of £2?

Numbers, first *larger* than second:

- What is 15 as a fraction/percentage/proportion of 8?

Quantities, first *larger* than second (answer is not in units, e.g. kg):

- What is 23 kg as a fraction/percentage/proportion of 8 kg?

Quantities (mixed units), first *larger* than second (answer is not in units, e.g. m or cm):

- What is 3 m as a fraction/percentage/proportion of 70 cm?

Expressing proportions and their inverses

As above, deal with various forms: fractions/decimal fractions/percentages; numbers/quantities; same units/mixed units.

Examples:

- What is 6 as a proportion of 25?
- What is 25 as a proportion of 6?

Expressing rates

These should be written as 'this per that'. Examples:

- 367 miles travelled at a constant speed for 4 hours
- £87 split equally between 6 children
- 14 hours of work to be covered by 9 clerks

Inverting rates

Using the previous examples:

- What is the meaning of 'that per this'? When is it useful?
 - hours per mile
 - children per pound
 - clerks per hour

Finding proportions of ...

Numbers, proportions *less* than 1, some terminating decimals and some not:

- What is three fifths of 83?
- What is 0.6 of 83?
- What is 60% of 83?

Quantities, proportions *less* than 1, some terminating decimals and some not (answer is in units, e.g. £):

- What is three sevenths of £17?

Numbers, proportions *greater* than 1, some terminating decimals and some not:

- What is ten sixths of 74?
- What is 1.67 of 74?
- What is 167% of 74?

Quantities, proportions *greater* than 1, some terminating decimals and some not (answer is in units, e.g. litres):

- What is four thirds of 14 litres?

Comparing proportions

Numbers, first *smaller* than second:

- What is greater:
5 as a proportion of 85, or
7 as a proportion of 90?

Quantities, first *smaller* than second (answer is not in units, e.g. minutes):

- What is greater:
5 minutes as a proportion of 18 minutes, or
3 minutes as a proportion of 10 minutes?

Quantities (mixed units), first *smaller* than second (answer is not in units, e.g. £ or p):

- What is greater:
60p as a proportion of £2, or
90p as a proportion of £2.47?

Numbers, first *larger* than second:

- What is greater:
26 as a proportion of 8, or
32 as a proportion of 9?

Quantities, first *larger* than second (answer is not in units, e.g. cm):

- What is greater:
18 cm as a proportion of 7 cm, or
16 cm as a proportion of 6 cm?

Quantities (mixed units), first *larger* than second (answer is not in units, e.g. m or cm):

- What is greater:
3 m as a proportion of 70 cm, or
2.3 m as a proportion of 57 cm?

Inverting proportions and comparing

As above, deal with various forms: fractions/decimal fractions/percentages; numbers/quantities; same units/mixed units.

Example:

- What is greater:
9 as a proportion of 28, or
13 as a proportion of 40?
Given the previous fact, what is greater:
28 as a proportion of 9, or
40 as a proportion of 13?

Comparing rates

- What is the greater rate:
367 miles travelled at a constant speed for 4 hours, or
640 miles travelled at a constant speed for 7 hours?

Comparing quantities

Numbers, proportions *less* than 1, some terminating decimals and some not:

- Which is the greater:
one fifth of 83 or
one seventh of 90?

Quantities, proportions *less* than 1, some terminating decimals and some not (answer is in units, e.g. litres):

- Which is the greater:
16% of £25 or
25% of £16?

Numbers, proportions *greater* than 1, some terminating decimals and some not:

- Which is the greater:
five thirds of 35 or
seven quarters of 33?

Quantities, proportions *greater* than 1, some terminating decimals and some not (answer is in units, e.g. litres):

- Which is the greater:
ten thirds of 14 litres or
ten sevenths of 20 litres?

Using and applying rates

- 4 machines need 17 hours of maintenance. How many machines can be serviced in 5 hours?

What is the rate we use in this calculation? (Not expecting numerical answer but a rate, e.g. 'machines per hour')

What is the calculation? (Not expecting numerical answer but a calculation, e.g. $\frac{4}{17} \times 5$)

What is the answer?

- 4 machines need 17 hours of maintenance. How many hours are needed to service 7 machines?

What is the rate we use in this calculation? (Not expecting a numerical answer but a rate, e.g. 'hours per machine')

What is the calculation? (Not expecting numerical answer but a calculation, e.g. $\frac{17}{4} \times 7$)

What is the answer?