1. What fraction of the shape is shaded?

a) ☐ $\frac{1}{4}$

b) ☐ $\frac{4}{1}$

c) ☐ $\frac{1}{5}$

d) ☐ $\frac{4}{5}$

2. Which shape shows $\frac{3}{9}$ shaded in?

a) ☐ 

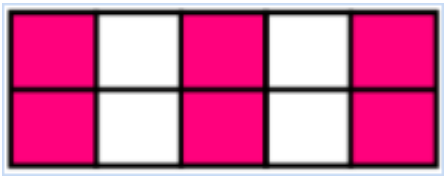
c) ☐ 

b) ☐ 

d) ☐ 

3. What fraction of the shape is shaded?

Select the equivalent fraction below.



a) ☐ $\frac{2}{5}$

b) ☐ $\frac{6}{4}$

c) ☐ $\frac{3}{5}$

d) ☐ $\frac{3}{2}$

4. What is the denominator of a fraction?

a) ☐ It is the top number and it shows how many parts we are looking at (shaded parts).

b) ☐ It is the bottom number and shows us how many equal parts there are; it is also the name of that fraction.

c) ☐ It is the top number and it shows us how many equal parts there are.

d) ☐ It is the bottom number and it shows us how many parts we are looking at (shaded parts).

5. What is the numerator of a fraction?

a) ☐ It is the top number and it shows how many parts we are looking at (shaded parts).

b) ☐ It is the bottom number and shows us how many equal parts there are; it is also the name of that fraction.

c) ☐ It is the top number and it shows us how many equal parts there are.

d) ☐ It is the bottom number and it shows us how many parts we are looking at (shaded parts).

6. Put the fractions in descending order: $\frac{5}{12}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{3}{4}$

a) ☐ $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$

b) ☐ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{5}{12}$

c) ☐ $\frac{5}{12}$ $\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{4}$

d) ☐ $\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{5}{12}$

7. Write $\frac{17}{5}$ as a mixed number.

a) ☐ $2\frac{7}{5}$

b) ☐ $1\frac{7}{5}$

c) ☐ $5\frac{1}{5}$

d) ☐ $3\frac{2}{5}$

8. $\frac{5}{9} + \frac{2}{9} =$

a) ☐ $\frac{7}{18}$

b) ☐ $\frac{1}{18}$

c) ☐ $\frac{7}{9}$

d) ☐ $\frac{14}{11}$

9. $\frac{6}{7} - \frac{3}{7} =$

a) ☐ $\frac{3}{7}$

b) ☐ 3

c) ☐ $\frac{3}{0}$

d) ☐ $\frac{1}{4}$

10. Write $3\frac{5}{8}$ as an improper fraction.

a) ☐ $\frac{15}{8}$

b) ☐ $\frac{5}{24}$

c) ☐ $\frac{29}{8}$

d) ☐ $\frac{8}{11}$

11. $\frac{3}{7} + \frac{5}{21} =$

a) ☐ $\frac{24}{12}$

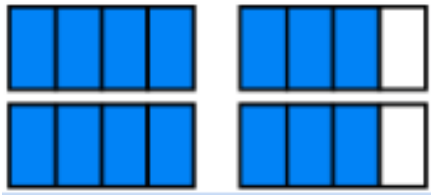
b) ☐ $\frac{8}{28}$

c) ☐ $\frac{14}{21}$

d) ☐ $\frac{10}{26}$

12. What is 2 lots of $1\frac{3}{4}$?

Write your answer as a mixed number in its simplest form.



a) ☐ $2\frac{6}{8}$

b) ☐ $\frac{14}{4}$

c) ☐ $3\frac{1}{2}$

d) ☐ $1\frac{6}{8}$

13. Which fraction is not equivalent to 0.46?

a) ☐ $\frac{46}{100}$

b) ☐ $\frac{46}{10}$

c) ☐ $\frac{460}{1000}$

d) ☐ $\frac{23}{50}$

14. $\frac{4}{9} - \frac{13}{45} =$

a) ☐ $\frac{9}{36}$

b) ☐ $\frac{9}{45}$

c) ☐ $\frac{7}{45}$

d) ☐ $\frac{5}{32}$

15. What number is the same as $\frac{2}{10} + \frac{4}{100} + \frac{6}{1000} =$

a) ☐ 2.46

b) ☐ 246

c) ☐ 0.246

d) ☐ 0.0246

16. Which number is **not** the same as 2.7?

a) ☐ 27 tenths

b) ☐ 2700 thousandths

c) ☐ 27 hundredths

d) ☐ 270 hundredths

17. Round 47.23 to the nearest 1 decimal place.

a) ☐ 47.2

b) ☐ 47.1

c) ☐ 47

d) ☐ 50

18. Order these decimals in ascending order:

3.425 3.31 3.8 3.099

a) ☐ 3.099 3.31 3.425 3.8

b) ☐ 3.8 3.31 3.099 3.425

c) ☐ 3.8 3.425 3.31 3.099

d) ☐ 3.425 3.099 3.31 3.8

19. What is **not** equivalent to 25%?

a) ☐ 0.25

b) ☐ $\frac{1}{4}$

c) ☐ $\frac{25}{100}$

d) ☐ $\frac{25}{10}$

20. In a garden, 25% of the area is for growing flowers. $\frac{1}{5}$ is taken up by the shed. The rest of the garden is covered in grass. How much of the garden is covered in grass? *Write your answer as a decimal.*

(Not drawn to scale)

a) ☐ 0.25

b) ☐ 0.55

c) ☐ 55%

d) ☐ 0.7

21. Which **three** numbers sum to make 1?

28% 0.3 0.42 $\frac{3}{100}$

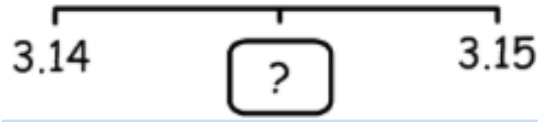
a) ☐ 0.42 28% $\frac{3}{100}$

b) ☐ 0.42 $\frac{3}{100}$ 0.3

c) ☐ 28% 0.3 0.42

d) ☐ 28% 0.3 $\frac{3}{100}$

22. What is the missing number on the number line?



a) ☐ 3.141

b) ☐ 3.149

c) ☐ 3.140

d) ☐ 3.145

23. Find 40% of £72.

a) ☐ £28.80

b) ☐ £30

c) ☐ £32

d) ☐ £43.20

24. Jason has a bar of chocolate. He gives his friend $\frac{2}{5}$ of his chocolate bar. What **percentage** of his bar of chocolate does he have left?

a) ☐ 30%

b) ☐ 60%

c) ☐ 3/5

d) ☐ 70%

25. 2.7 + 1.43 =

Write your answer as a mixed number.

a) ☐ $1\ \frac{7}{10}$

b) ☐ $4\ \frac{13}{100}$

c) ☐ I don't know how to change a decimal to a mixed number.

d) ☐ $3\ \frac{5}{10}$

1. What fraction of the shape is shaded? *Checks basic understanding of fractions of a shape.*

a) $\frac{1}{4}$ ***Pupil perceives this as 1 white part out of 4 red parts – lacks understanding of the numerator and the denominator.***

b) $\frac{4}{1}$ ***Pupil perceives this as 4 red parts and 1 white part – lacks understanding of the numerator and denominator.***

c) $\frac{1}{5}$ ***Pupil has identified the one white part out of 5 parts, but not the four red shaded parts.***

d) $\frac{4}{5}$ **Correct answer.**

2. Which of the following shapes shows $\frac{3}{9}$ shaded in? *Checks for basic fraction understanding in a shape.*

a)  **Correct answer.**

b)  ***Misconception – pupil sees the numerator as the number of shaded parts and the denominator as the number of remaining unshaded parts.***

c)  ***Misconception – pupil has counted the unshaded parts as being $\frac{3}{9}$, which is correct, but not what the question asks for. Pupil needs to read the question more carefully.***

d)  ***Pupil can see 3 shaded parts, but likely miscounted the total number of parts.***

3. What fraction of the shape is shaded? Circle the equivalent fraction below
Checks for understanding of equivalence through simplifying.

a) $\frac{2}{5}$ ***Misconception – pupil has counted the unshaded parts of the shape, but is able to simplify.***

b) $\frac{6}{4}$ ***Misconception – pupil does not understand that the fraction bar (–) means 'out of the whole shape/amount'. Pupil has counted the shaded parts of the shape correctly though.***

c) $\frac{3}{5}$ **Correct answer.**

d) $\frac{3}{2}$ ***Misconception – pupil does not understand that the denominator is the number of equal parts in the whole. Pupil may have some understanding of equivalence.***

4. What is the denominator of a fraction?
Checks understanding of the vocabulary linked to fractions.

a) It is the top number and it shows how many parts we are looking at (shaded parts).
Pupil has confused the denominator with the numerator.

b) It is the bottom number and shows us how many equal parts there are; it is also the name of that fraction.
Correct answer.

c) It is the top number and it shows us how many equal parts there are.
May understand that the denominator shows the number of equal parts but thinks that the top number represents this.

d) It is the bottom number and it shows us how many parts we are looking at (shaded parts).
May understand that the denominator is the bottom number but thinks that this shows the number of parts we need to look at, rather than the whole.

5. What is the numerator of a fraction?
Checks understanding of the vocabulary linked to fractions.

a) It is the top number and it shows how many parts we are looking at (shaded parts).
Correct answer.

b) It is the bottom number and shows us how many equal parts there are; it is also the name of that fraction.
Pupil has confused the denominator with the numerator.

c) It is the top number and it shows us how many equal parts there are.
May understand that the numerator is the top number but thinks that this shows the number of equal parts there are.

d) It is the bottom number and it shows us how many parts we are looking at (shaded parts).
May understand that the numerator shows the number of parts we are looking at, but thinks that the bottom number represents this.

6. Put the fractions in descending order: $\frac{5}{12}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{3}{4}$
Checks ability to compare and order fractions when all denominators are a factor of the same number.

a) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ ***Ordered in descending order according to the denominator or numerator. Pupil lacks understanding of finding equivalence to compare.***

b) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ **Correct answer.**

c) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ ***Ordered in ascending order – pupil may not understand the meaning of 'ascending' and 'descending.***

d) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ ***Ordered in ascending order according to the numerator. Pupil lacks understanding of finding equivalence to compare.***

7. Write $\frac{17}{5}$ as a mixed number *Checks converting an improper fraction to a mixed number.*

a) $2\frac{7}{5}$ ***The answer is correct but has not been written in its simplest form. Pupil has some understanding of converting but is not fully secure yet.***

b) $1\frac{7}{5}$ ***Pupil has just taken the '1' out from the '17' without any real understanding of question.***

c) $5\frac{1}{5}$ ***Random answer – pupil lacks understanding of equivalence.***

d) $3\frac{2}{5}$ **Correct answer.**

8. $\frac{5}{9} + \frac{2}{9}$ *Checks adding fractions with the same denominators.*

a) $\frac{7}{18}$ ***Misconception – adding the numerators and the denominators. Pupil has not understood the concept of '5 lots of ninths plus 2 lots of ninths'.***

b) $\frac{10}{18}$ ***Misconception – multiplying the numerators and adding the denominators. Pupil has not understood the concept of '5 lots of ninths plus 2 lots of ninths'.***

c) $\frac{7}{9}$ **Correct answer.**

d) $\frac{14}{11}$ ***Random answer – pupil does not understand addition of fractions.***

9. $\frac{6}{7} - \frac{3}{7}$ *Checks subtracting fractions with the same denominators.*

a) $\frac{3}{7}$ **Correct answer.**

b) 3 ***Misconception – subtracting the numerators and the denominators. Pupil has not understood the concept of '6 lots of sevenths minus 3 lots of sevenths'.***

c) $\frac{3}{0}$ ***Misconception – subtracting the numerators and the denominators. Pupil has not understood the concept of '6 lots of sevenths minus 3 lots of sevenths'.***

d) $\frac{1}{4}$ ***Found the difference diagonally – pupil does not understand subtraction of fractions.***

10. Write $3\frac{5}{8}$ as an improper fraction *Checks expressing a mixed number as an improper fraction.*

a) $\frac{15}{8}$ ***Pupil has multiplied the numerator by the whole number – lacks understanding of how a whole number can be represented by a fraction.***

b) $\frac{5}{24}$ ***Pupil has multiplied the denominator by the whole number – lacks understanding of how a whole number can be represented by a fraction.***

c) $\frac{29}{8}$ **Correct answer.**

d) $\frac{8}{11}$ ***Pupil has added '3' to both the numerator and denominator – lacks understanding of 'eighths' being the name of the fraction.***

11. $\frac{3}{7}+\frac{5}{21}$ *Checks adding fractions where one denominator is a multiple of the other.*

a) $\frac{24}{12}$ ***Pupil lacks understanding of how to add fractions with different denominators – pupil has added diagonally.***

b) $\frac{8}{28}$ ***Pupils has added the numerators and the denominators. Pupil lacks understanding that fractions can only be added when denominators are the same and that equivalence needs to be used first.***

c) $\frac{14}{21}$ **Correct answer.**

d) $\frac{10}{26}$ ***Pupil has added the digits in the fraction vertically and then combined them – no understanding of adding fractions.***

12. What is 2 lots of $1\frac{3}{4}$? Write your answer as a mixed number in its simplest form.

Checks multiplying a mixed number by a whole number when supported by diagrams.

a) $2\frac{6}{8}$ ***Pupil has multiplied all digits by 2 – lacks understanding of the denominator being the 'name' of the fraction.***

b) $\frac{14}{4}$ ***Although correct, it is written as an improper fraction. Pupil needs to read the question more carefully.***

c) $3\frac{1}{2}$ **Correct answer.**

d) $1\frac{6}{8}$ ***Pupil ay have some understanding of converting mixed numbers into improper fractions, but has multiplied the denominator by 2.***

13. Which fraction is not equivalent to 0.46?
Checks understanding of equivalence between fractions and decimals.

a) $\frac{46}{100}$ ***Lacks understanding of the fact that the fraction by can also mean 'divide by'.***

b) $\frac{46}{10}$ **Correct answer ($\frac{46}{10}$ = 4.6).**

c) $\frac{46}{1000}$ ***Lacks understanding of the fact that the fraction by can also mean 'divide by'. Pupil may not fully understand equivalence.***

d) $\frac{23}{50}$ ***Pupil lacks understanding of equivalence and the fact that the fraction by can also mean 'divide by'.***

14. $\frac{4}{9} - \frac{13}{45}$ *Checks subtracting fractions with denominators that are multiples of the same number.*

a) $\frac{9}{36}$ ***Pupil has found the difference between the pair of numerators and the pair of denominators, but does not understand the denominator as the name of the fraction.***

b) $\frac{9}{45}$ ***Pupil has found the difference in the numerator without finding equivalence first. Pupil may have some understanding that the common denominator will be 45, but is not secure.***

c) $\frac{7}{45}$ **Correct answer.**

d) $\frac{5}{32}$ ***Pupil has found the difference vertically between each fraction and then put the numbers together to form a fraction - lacks understanding.***

15. What number is the same as $\frac{2}{10} + \frac{4}{100} + \frac{6}{1000}$?
Checks understanding of links between fractions and decimals.

a) 2.46
Misconception with place value, but pupil may have some understanding of fraction and decimal equivalence.

b) 246
Pupil lacks understanding of the relationship between fractions and decimals.

c) 0.246
Correct answer.

d) 0.0246
Misconception with place value, but may have some understanding of fraction and decimal equivalence. Pupil's misconception could be in associating 'tenths, hundredths and thousandths' to be the '2nd, 3rd and 4th' column after the decimal point.

16. Which number is not the same as 2.7?
Checks ability to recognise and use tenths, hundredths and thousandths and relate them to decimal equivalents.

a) 27 tenths
Pupil lacks understanding of the 'divide by' concept of the fraction bar (–): $\frac{27}{10} = 2.7$

b) 2700 thousandths
Pupil lacks understanding of the 'divide by' concept of the fraction bar (–): $\frac{2700}{1000} = 2.7$

c) 27 hundredths **Correct answer (**$\frac{27}{100} = 4.6$**).**

d) 270 hundredths
Lacks understanding of the 'divide by' concept of the fraction bar (–): $\frac{270}{100} = 2.7$

17. Round 47.23 to the nearest 1 decimal place
Checks rounding a decimal number to 1 decimal place.

a) 47.2
Correct answer.

b) 47.1
Pupil may have some understanding of the need to round down, but has a misconception of what this number should be and has rounded to the previous number.

c) 47
Pupil has rounded to the nearest whole number, may not understand what 'nearest 1 decimal place' means.

d) 50
Pupil has rounded to the nearest 10 – may lack understanding of what is meant by 'nearest 1 decimal place'.

18. Order these decimals in ascending order: 3.425 3.31 3.8 3.099
Checks ability to order and compare numbers up to 3 decimal place.

a) 3.099 3.31 3.425 3.8 **Correct answer.**

b) 3.8 3.31 3.099 3.425
Pupil has looked at the numbers after the decimal point and ordered according to 'size' of this number. Pupil has a lack of place value knowledge.

c) 3.8 3.425 3.31 3.099
Pupil has ordered in descending order – may be a misconception around the words 'ascending' and 'descending'.

d) 3.425 3.099 3.31 3.8
Pupil has looked at the numbers after the decimal point and ordered in descending order according to 'size' of this number. Pupil has a lack of place value knowledge as well as misconception with the vocabulary.

19. What is not equivalent to 25%?
Checks understanding of fraction, decimal and percentage equivalence.

a) 0.25 ***Pupil lacks understanding of decimal and percentage equivalence.***

b) $\frac{1}{4}$ ***Pupil lacks knowledge of basic fractions and related percentages.***

c) $\frac{25}{100}$ ***Pupil does not understand that percent is a fraction 'out of 100'.***

d) $\frac{25}{10}$ **Correct answer ($\frac{25}{10}$ = 4.6).**

20. In a garden, 25% of the area is for growing flowers. $\frac{1}{5}$ is taken up by the shed. The rest of the garden is covered in grass. How much of the garden is covered in grass? Write this amount as a decimal.
Checks ability to solve problems which require knowing fraction, percentage and decimal equivalents.

a) 0.25
Misconception may lie in the confusion between $\frac{1}{5}$ being equal to 0.5 or 50%.

b) 0.55
Correct answer.

c) 55%,
Pupil may have been able to work out the correct percentage, but is unsure how to convert this into a decimal.

d) 0.7
Random answer – pupil lacks understanding of fraction, decimal and percentage equivalents.

21. Which three numbers sum to make 1? 28% 0.3 0.42 3/100
Checks converting fractions, decimals and percentage equivalents and adding to make 1.

a) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ ***May have some understanding of equivalence but may have a place value misconception: $\frac{3}{100} \neq 0.3$***

b) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ ***Random answer – pupil lacks understanding of equivalence.***

c) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ **Correct answer.**

d) $\frac{5}{12}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ ***Random answer – pupil lacks understanding of equivalence.***

22. What is the missing number on the number line?
Checks ability to order numbers up to 3 decimal places on a number line.

a) 3.141
Pupil lacks place value understanding of numbers up to 3 decimal place: half way in any column is 5 due to the base 10 nature of the number system.

b) 3.149
Pupil lacks place value understanding of numbers up to 3 decimal place: half way in any column is 5 due to the base 10 nature of the number system.

c) 3.140
Pupil lacks place value understanding of numbers up to 3 decimal place: half way in any column is 5 due to the base 10 nature of the number system.

d) 3.145
Correct answer.

23. Find 40% of £72
Checks ability to find a percentage of a given quantity.

a) £28.80
Correct answer.

b) £30
Pupil may have estimated the answer knowing that 40% is less than half the amount – not secure in finding percentages of an amount.

c) £32
Pupil lacks understanding and has simply found the difference between the two numbers.

d) £43.20
Has found 60% – pupil may have some understanding of how to find a percentage of an amount .

24. Jason has a bar of chocolate. He gives his friend $\frac{2}{5}$ of his chocolate bar.
What percentage of of his bar of chocolate does he have left?
Checks ability to solve problems knowing fractions and percentage equivalents.

a) 30%
Pupil may be aware that $\frac{3}{5}$ ***of the bar is left, but is unable to convert to a percentage.***

b) 60%
Correct answer.

c) 3/5
Correct fraction – pupil has not converted it to a percentage.

d) 70%
Random answer – pupil lacks understanding of how to find the difference in a fraction, as well as how to convert between fractions and percentages.

25. 2.7 + 1.43 = ? Write your answer as a mixed number.
Checks adding decimals and converting decimals to fraction equivalents.

a) $1\frac{7}{10}$
Misaligning numbers when adding decimals – pupil may have some understanding of converting a decimal to a mixed number.

b) $4\frac{13}{100}$
Correct answer.

c) I don't know how to change a decimal to a mixed number
Pupil lacks ability to make the connection between converting from decimals to fractions and decimals to mixed number – may not be secure in converting between improper fractions and mixed number.

d) $3\frac{5}{10}$
Adding digits from different columns (especially if they did the addition mentally). Pupil may have some understanding of converting a decimal into a mixed number.