Multiplication and division investigation

1 List the multiples of 16 from 1 × 16 through to 10 × 16.

2 Make up a 3-digit number where the last two digits are a multiple of 4, for example 764 or 328.

3 Divide this number by 16. Find the exact answer, writing the fraction part of the answer as a decimal where you can.

$$764 \div 16 = 47\frac{12}{16} = 47\frac{3}{4} = 47{\cdot}75$$

4 Repeat for other 3-digit numbers and then for some 4-digit numbers. The last two digits must be a multiple of 4.

5 What do you notice?

6 Now try this with numbers where the last two digits are not a multiple of 4. What happens now?

- **I am confident with multiplying and dividing by 16.**

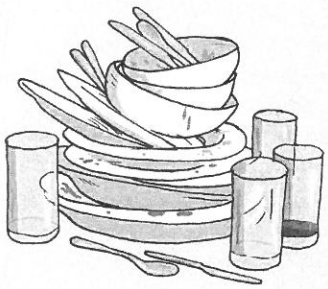
Dividing with a decimal remainder

Find the exact answers to these divisions. Write fractions as decimals where you can.

$426 \div 12 = 35\frac{6}{12} = 35\frac{1}{2} = 35{\cdot}5$

1. $426 \div 12 =$ ☐
2. $867 \div 24 =$ ☐
3. $729 \div 12 =$ ☐
4. $531 \div 24 =$ ☐
5. $426 \div 24 =$ ☐
6. $531 \div 15 =$ ☐
7. $426 \div 15 =$ ☐
8. $867 \div 12 =$ ☐
9. $729 \div 24 =$ ☐
10. $531 \div 12 =$ ☐
11. $729 \div 18 =$ ☐
12. $531 \div 18 =$ ☐
13. $426 \div 18 =$ ☐
14. $867 \div 15 =$ ☐
15. $729 \div 15 =$ ☐

Solve these word problems.



16. Twenty-four friends went out for a meal. The total bill came to £654. If they choose to split the bill equally, how much should they each pay?
17. Over an 18-month period, Jack was given £459 in pocket money. How much was this per month?
18. A farmer's field has a wall that is 366 m long. The farmer wants to put a fence beside the wall to stop his sheep jumping over the wall. He wants to split the length into 15 equal sections. How wide should each section be?

THINK

Some people are going to a pizza party. There are 16 of them and they share the cost. The bill comes to £212. How much do they each pay?

- **I am confident with changing fraction remainders into decimals.**

Adding and subtracting fractions

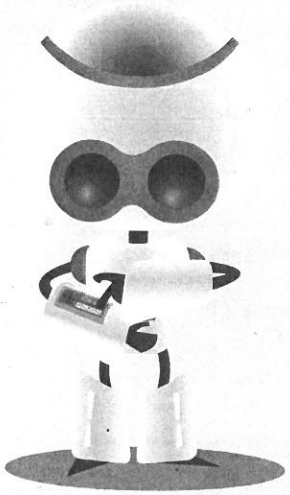
$\frac{3}{4} + \frac{2}{3} = \square$

$= \frac{9}{12} + \frac{8}{12}$

$= \frac{17}{12}$

$= 1\frac{5}{12}$

Write both as $\frac{1}{12}$s.



1. $\frac{2}{5} + 4 = \square$
2. $\frac{2}{3} + \frac{5}{6} = \square$
3. $\frac{2}{5} + \frac{2}{3} = \square$
4. $\frac{3}{4} + \frac{1}{5} = \square$
5. $\frac{2}{3} + \frac{2}{4} = \square$
6. $\frac{7}{8} - \frac{2}{3} = \square$
7. $\frac{2}{5} - \frac{1}{6} = \square$
8. $1\frac{2}{9} - \frac{2}{3} = \square$
9. $1\frac{4}{5} - \frac{3}{4} = \square$
10. $\frac{8}{9} - \frac{1}{5} = \square$

Write both fractions out with the same denominator.

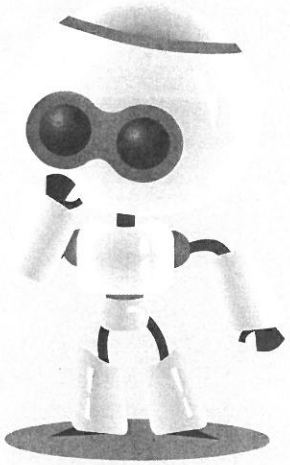
THINK How can you use what you have just practised to work out $\frac{2}{5} + 0{\cdot}8$? What is the answer?

I am confident with adding and subtracting fractions.

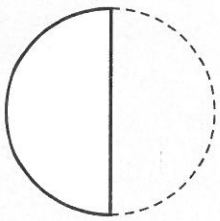
Multiplying and dividing with fractions

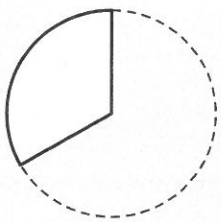
Solve these multiplications.

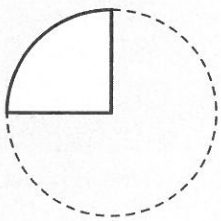
1. $5 \times \frac{1}{4} = \square$
2. $7 \times \frac{1}{6} = \square$
3. $11 \times \frac{1}{3} = \square$
4. $8 \times \frac{1}{4} = \square$
5. $8 \times \frac{1}{5} = \square$
6. $10 \times \frac{1}{7} = \square$
7. $15 \times \frac{1}{4} = \square$
8. $50 \times \frac{1}{9} = \square$



Answer these divisions.







9. $\frac{1}{2} \div 2 = \square$
10. $\frac{1}{2} \div 3 = \square$
11. $\frac{1}{2} \div 4 = \square$
12. $\frac{1}{3} \div 2 = \square$
13. $\frac{1}{3} \div 3 = \square$
14. $\frac{1}{3} \div 4 = \square$
15. $\frac{1}{4} \div 2 = \square$
16. $\frac{1}{4} \div 3 = \square$
17. $\frac{1}{4} \div 4 = \square$

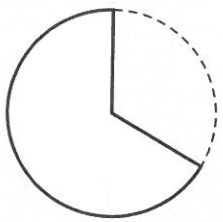
Write a multiplication where the answer is smaller than both of the numbers being multiplied. Write one where the answer is bigger than both numbers being multiplied.

I am confident with multiplying and dividing fractions.

Answer these multiplications and divisions.

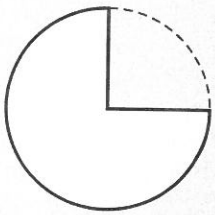
1. $12 \times \frac{1}{6} = \square$
2. $\frac{1}{6} \div 2 = \square$
3. $11 \times \frac{1}{2} = \square$
4. $\frac{1}{6} \div 3 = \square$
5. $22 \times \frac{1}{4} = \square$
6. $24 \times \frac{1}{5} = \square$
7. $\frac{1}{8} \div 3 = \square$
8. $15 \times \frac{1}{8} = \square$
9. $\frac{1}{3} \div 4 = \square$
10. $\frac{1}{3} \div 3 = \square$

Now solve these questions.

11. 

$\frac{1}{2}$ of $\frac{2}{3}$

$\frac{1}{4}$ of $\frac{2}{3}$

12. 

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

$\frac{1}{3} \times \frac{3}{4}$

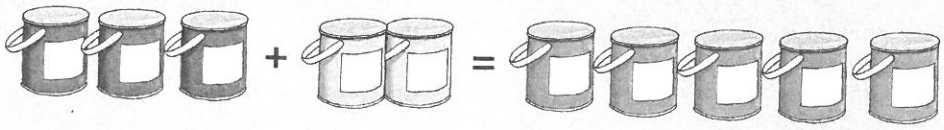
Multiply these fractions together.

13. $\frac{1}{3} \times \frac{2}{3} = \square$
14. $\frac{1}{4} \times \frac{1}{3} = \square$
15. $\frac{1}{3} \times \frac{4}{9} = \square$
16. $\frac{1}{4} \times \frac{3}{4} = \square$
17. $\frac{1}{5} \times \frac{3}{4} = \square$
18. $\frac{1}{3} \times \frac{4}{5} = \square$
19. $\frac{1}{2} \times \frac{3}{8} = \square$
20. $\frac{1}{3} \times \frac{7}{8} = \square$
21. $\frac{1}{7} \times \frac{2}{3} = \square$

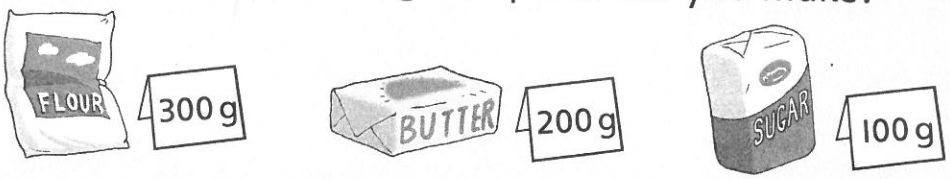
THINK What number can multiply a number of thirds, quarters and sixths to give a whole number answer? Test out your suggestion.

I am confident with multiplying and dividing fractions.

Solve the word problems.



1. How many tins of yellow paint are needed to make 10 tins of green paint?
2. How many tins of blue paint are needed to make 25 tins of green paint?
3. You have lots of tins of yellow paint but only 9 tins of blue paint. How many tins of green paint can you make?



4. These are the ingredients for six pieces of shortbread. How much of the ingredients would be needed to make 12 pieces of shortbread?
5. How much of the ingredients would be needed to make 9 pieces?
6. Sarah uses 900 g of flour. How much butter and sugar should she use?
7. Poor Cat tried to make 15 pieces of shortbread. She used 800 g of flour, 600 g of butter and 250 g of sugar. How much should she have used?

8. 
A smoothie is made with 10 strawberries, 15 raspberries and 100 ml of apple juice. If Jarek uses 20 strawberries, how much of the other ingredients does he need?

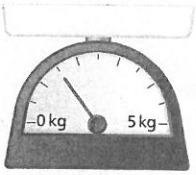
Some purple paint has a ratio of 4 parts blue to 7 parts red. If Dad decides it is too bluish, what ratio can he try? How much red would he then need if he uses 300 ml of blue?

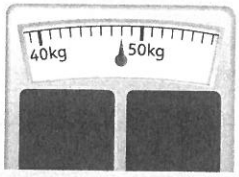
I am confident with solving word problems involving ratio.

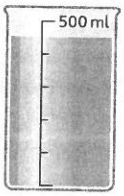
Reading scales and measures problems

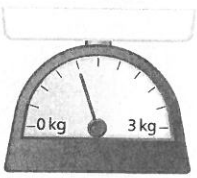
Write the value for each scale.

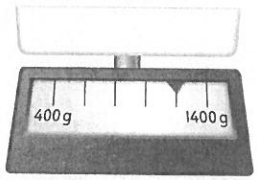
1. 

2. 

3. 

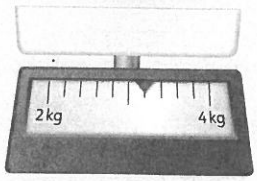
4. 

5. 

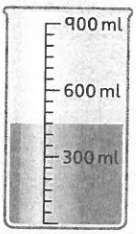
6. 

7. 

8. 

9. 

Now solve these problems.

10. 

a) If 150 ml is added, how much will be in the jar?

b) If 300 ml is taken out, how much will be left in the jar?

Can you solve this challenge?

11. Devise a noise scale to monitor the amount of noise in the classroom. The 'noise units' are decibels. We know that:

Near silence is 0 decibels
A whisper is 15 decibels
Normal adult talk is 50 decibels
A lawnmower is 90 decibels
A rock concert or jet engine is 120 decibels.

Draw your classroom noise scale, then mark the noise levels at the end of the day and at a quiet reading time. Can you mark some other times as well?

I am confident with reading and creating scales.