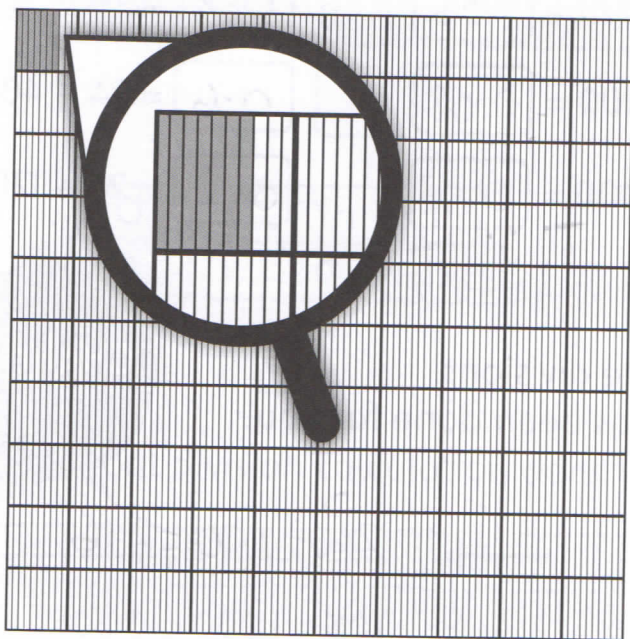


Decimals as fractions

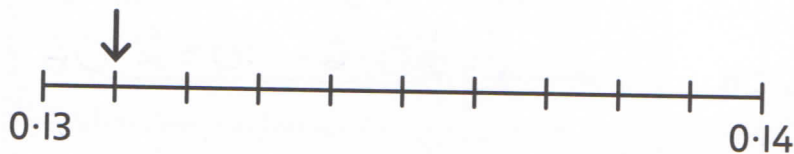
1 Write each decimal as a fraction.

a)



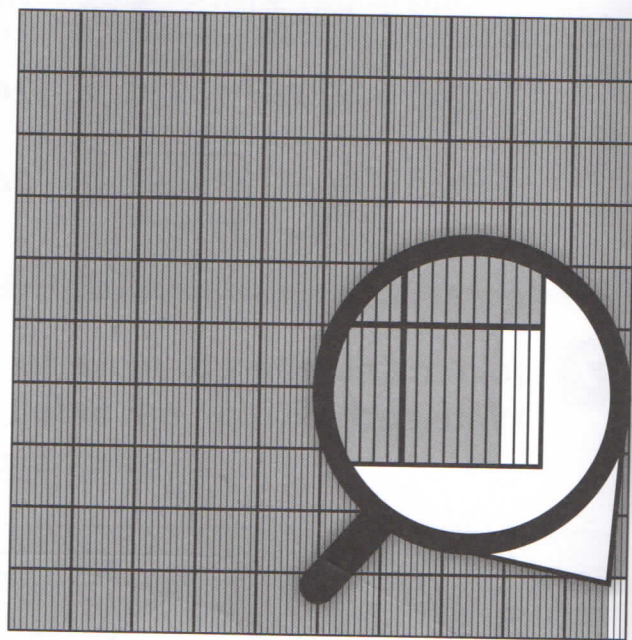
0.007 is equivalent to $\frac{7}{1000}$

b)



0.131 is equivalent to $\frac{131}{1000}$

c)



0.997 is equivalent to $\frac{997}{1000}$

d)



0.51 is equivalent to $\frac{51}{100}$

2 Convert these fractions to decimals then mark their position on the number line.

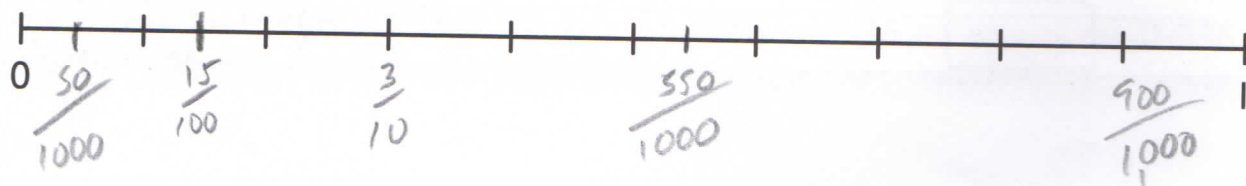
$$\frac{900}{1,000} = 0.9$$

$$\frac{15}{100} = 0.15$$

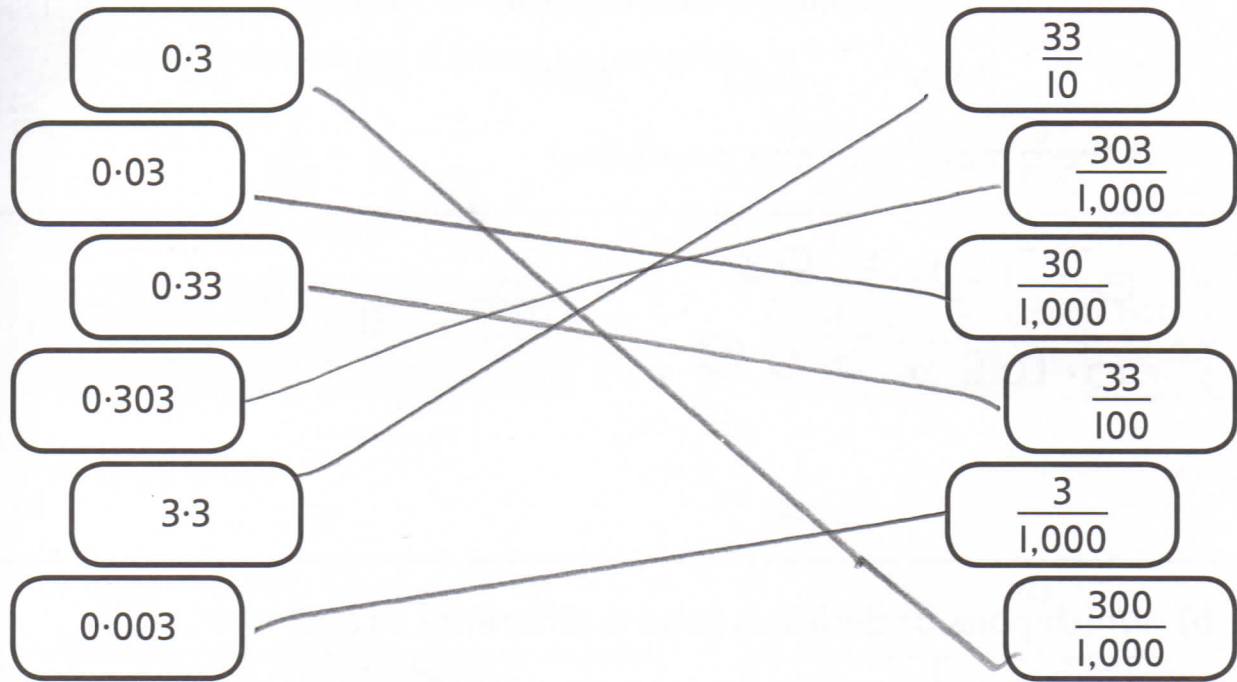
$$\frac{3}{10} = 0.3$$

$$\frac{550}{1,000} = 0.55$$

$$\frac{50}{1,000} = 0.05$$



3 Match each decimal to the equivalent fraction.



4 Write each decimal as a fraction, then simplify as far as you can.

a) 0.04 $\frac{4}{100} = \frac{2}{50} = \frac{1}{25}$

b) 0.05 $\frac{5}{100} = \frac{1}{20}$

c) 0.004 $\frac{4}{1000} = \frac{1}{250}$

d) 0.005 $\frac{5}{1000} = \frac{1}{200}$

5 a) Which of these fractions is equivalent to 1.823? Circle your answer. 

$1 \frac{823}{1,000}$

$1 \frac{823}{100}$

$\frac{8}{23}$

$\frac{1,000}{823}$

b) Which of these fractions is equivalent to 0.85? Circle your answer.

$\frac{85}{10}$

$\frac{17}{10}$

$\frac{8}{5}$

$\frac{17}{20}$

$$\frac{12}{100}$$

$$20 \div 12$$

- 6 a) Which of these decimals add together to make $\frac{3}{25}$?

0.1

0.105

0.02

0.015

0.01

0.2

Is there more than one possibility?

CHALLENGE

$$0.1 + 0.02$$

$$0.105 + 0.015$$

- b) Which pairs of decimals have a difference of $\frac{5}{250}$?

0.2

0.04

~~2~~

1.02

2.04

~~1.98~~

1

2.6

10.4

$$= \frac{20}{1000} = 0.02$$

2 and 1.98

Reflect

Explain how to write 0.555 as a fraction and how to simplify it as far as you can.

$$\frac{555}{1000} = \frac{111}{200}$$

Fractions as decimals 1

1 Write each fraction on a place value grid.

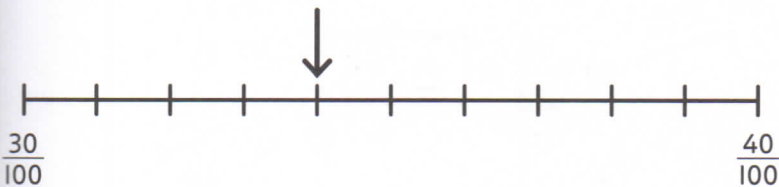
a) $\frac{3}{100}$

O	•	Tth	Hth	Thth
0	•	0	3	

c) $\frac{3}{1,000}$

O	•	Tth	Hth	Thth
0	•	0	0	3

b)



O	•	Tth	Hth	Thth
0	•	3	3	

d)

$\frac{345}{1,000}$				
$\frac{3}{10}$	$\frac{4}{100}$	$\frac{5}{1,000}$		

O	•	Tth	Hth	Thth
0	•	3	4	5

2 a) Which decimal is equivalent to $\frac{77}{10}$? Circle your answer.

0.77

77.10

7.7

77.7

b) Which decimal is equivalent to $\frac{370}{100}$? Circle your answer.

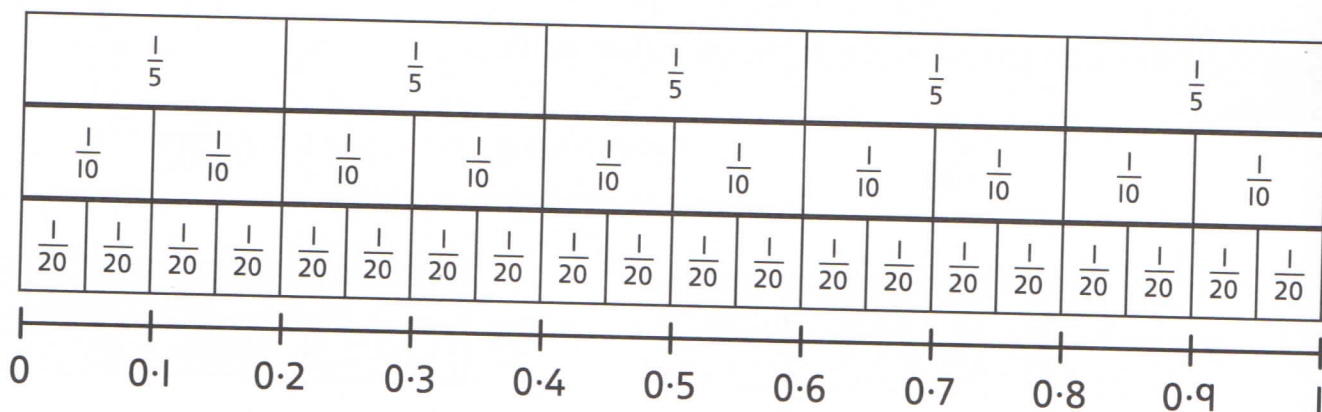
0.37

0.037

0.307

3.7

- 3 Use the fraction wall to help convert these fractions to decimals.



a) $\frac{2}{5} = 0.4$

d) $\frac{4}{5} = 0.8$

b) $\frac{8}{20} = 0.4$

e) $\frac{11}{20} = 0.55$

c) $\frac{17}{20} = 0.85$

- 4 Use equivalent fractions to convert these fractions to decimals.

a) $\frac{1}{50} = \frac{2}{100} = 0.02$

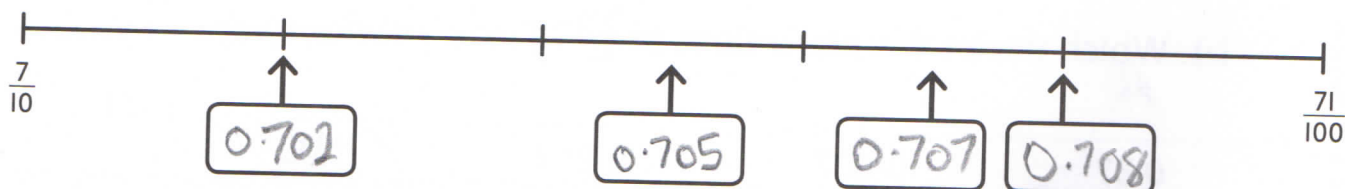
d) $\frac{3}{50} = \frac{6}{100} = 0.06$

b) $\frac{3}{200} = \frac{15}{1,000} = 0.015$

e) $\frac{99}{500} = \frac{198}{1,000} = 0.198$

c) $\frac{99}{250} = \frac{396}{1,000} = 0.396$

- 5 Write the decimals that the arrows are pointing to.



CHALLENGE

- 6 Use these digit cards to make fractions, where one card is the denominator and one card is the numerator. Convert each fraction to a decimal and write it in the correct column of the table.

2

4

5

25

50

200

250

500

Between 0 and 1	Between 1 and 10	Greater than 10
many answers $\frac{2}{4} = 0.5$	$\frac{25}{4}$ 6.25	$\frac{25}{2}$ 12.5

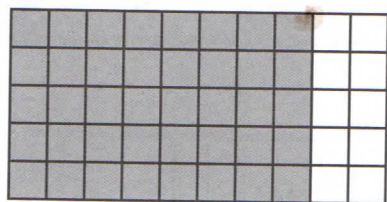
Reflect

What is the same and what is different about converting from decimals to fractions and converting from fractions to decimals?

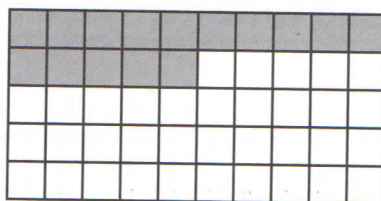
- _____
- _____
- _____
- _____

Fractions as decimals 2

1 Write each fraction as a decimal.

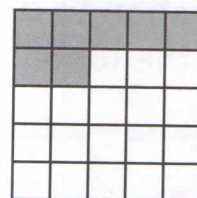


0.6



$\frac{15}{50}$

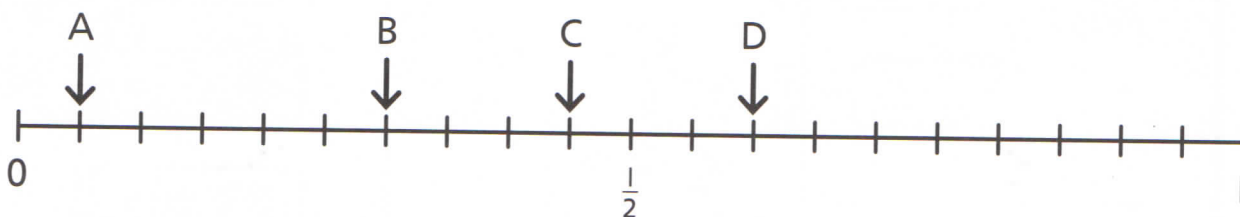
0.3



$\frac{7}{25}$

0.28

2 Write an equivalent fraction and a decimal for each of the fractions marked on the number lines.

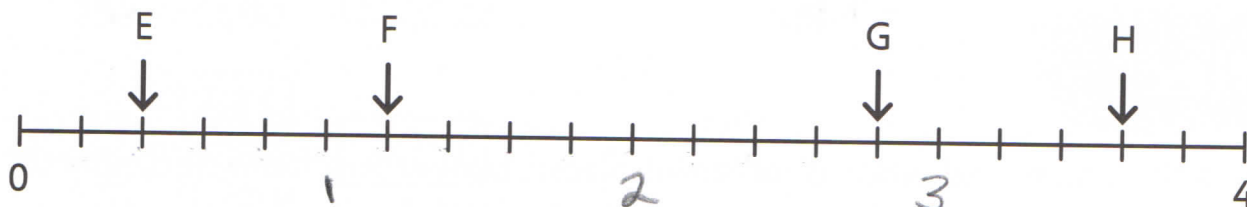


$$A = \frac{1}{20} = 0.05$$

$$C = \frac{9}{20} = 0.45$$

$$B = \frac{6}{20} = 0.3$$

$$D = \frac{11}{20} = 0.55$$



$$E = \frac{4}{10} = 0.4$$

$$G = \frac{28}{10} = 2.8$$

$$F = \frac{8}{10} = 0.8$$

$$H = \frac{36}{10} = 3.6$$

- 3 Use equivalent fractions to convert these fractions into divisions and decimals.

$$\frac{3}{12} = \frac{\boxed{1}}{\boxed{4}}$$

$$\frac{7}{50} = \frac{\boxed{14}}{\boxed{100}}$$

$$\frac{81}{250} = \frac{\boxed{324}}{\boxed{1000}}$$

$$\boxed{1} \div \boxed{4}$$

$$\boxed{14} \div \boxed{100}$$

$$\boxed{324} \div \boxed{1000}$$

$$0.\boxed{25}$$

$$0.\boxed{14}$$

$$0.\boxed{324}$$

- 4 Use short division to convert these fractions to decimals.

$$\frac{5}{8}$$

$$\frac{5}{12}$$

$$\frac{12}{5}$$

$$8 \overline{) 5.5000} \quad 0.625$$

$$12 \overline{) 5.5000} \quad 0.41\bar{6}$$

$$5 \overline{) 12.20} \quad 2.4$$

$$\frac{5}{8} = 0.\boxed{625}$$

$$\frac{5}{12} = \boxed{0.41\bar{6}}$$

$$\frac{12}{5} = \boxed{2.4}$$

- 5 Convert these fractions into decimals using the most appropriate method.

a) $\frac{1}{6}$

$$6 \overline{) 1.000} \quad 0.1\bar{6}$$

c) $\frac{54}{2,000}$

$$\frac{27}{1000} \quad 0.0027$$

b) $\frac{16}{80}$

$$\frac{4}{20} = \frac{20}{100} = 0.2$$

d) $\frac{14}{24}$

$$12 \overline{) 7.7000} \quad \frac{7}{12} \quad 0.58\bar{3}$$

- 6 a) Use short division to find the decimal equivalents of these fractions.

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

$$\begin{array}{r} 0.1 \\ 9 \overline{) 1.00} \end{array}$$

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

$$\begin{array}{r} 0.2 \\ 9 \overline{) 2.00} \end{array}$$

$$\frac{3}{9} = \boxed{3} \div \boxed{9}$$

$$\begin{array}{r} 0.3 \\ 9 \overline{) 3.00} \end{array}$$

$$\frac{4}{9} = \boxed{4} \div \boxed{9}$$

$$\begin{array}{r} 0.4 \\ 9 \overline{) 4.00} \end{array}$$

- b) Without working them out, predict the missing decimal equivalents to three dp.

$$\frac{5}{9} = 0.\boxed{555}$$

$$\frac{9}{9} = \boxed{1}$$

$$\frac{6}{9} = 0.\boxed{666}$$

$$\frac{10}{9} = \boxed{1.111}$$

$$\frac{7}{9} = 0.\boxed{777}$$

$$\frac{11}{9} = \boxed{1.222}$$

$$\frac{8}{9} = \boxed{888}$$

$$\frac{19}{9} = \boxed{2.111}$$

Reflect

Explain how to use decimals to compare $\frac{5}{8}$ and $\frac{55}{100}$.

$\frac{5}{8} = \frac{55}{88}$
 $\frac{55}{88}$ is bigger than $\frac{55}{100}$

Multiplying decimals I

I Complete these multiplication calculations.

T	O	•	Tth	Hth
		•	0.1 0.1 0.1 0.1	

$$4 \times 0.2 = \boxed{0.8}$$

T	O	•	Tth	Hth
		•		0.01 0.01 0.01 0.01

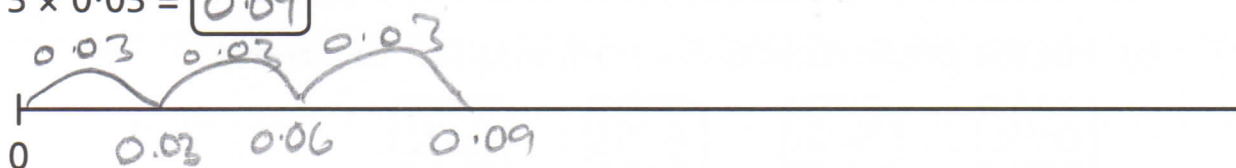
$$\boxed{3} \times \boxed{0.02} = \boxed{0.06}$$

2 Complete the number line to represent each calculation, then solve each calculation.

a) $3 \times 0.3 = \boxed{0.9}$



b) $3 \times 0.03 = \boxed{0.09}$



- 3 Bella has 3 buckets of water. She fills each one with 0.3 litres of water. How much more water does she need to make 1 litre?



$3 \times 0.3 = 0.9 \text{ L}$
 She needs 0.1 litre more

Bella needs 0.1 litres more water to make 1 litre.

- 4 a) Work out each calculation. Give your answers as decimals.

$$21 \times \frac{2}{10} = \text{4.2}$$

$$201 \times 0.03 = \text{6.03}$$

$$310 \times 0.02 = \text{6.2}$$

$$31 \times \frac{3}{100} = \text{0.93}$$



- b) Put the products in order from smallest to largest.

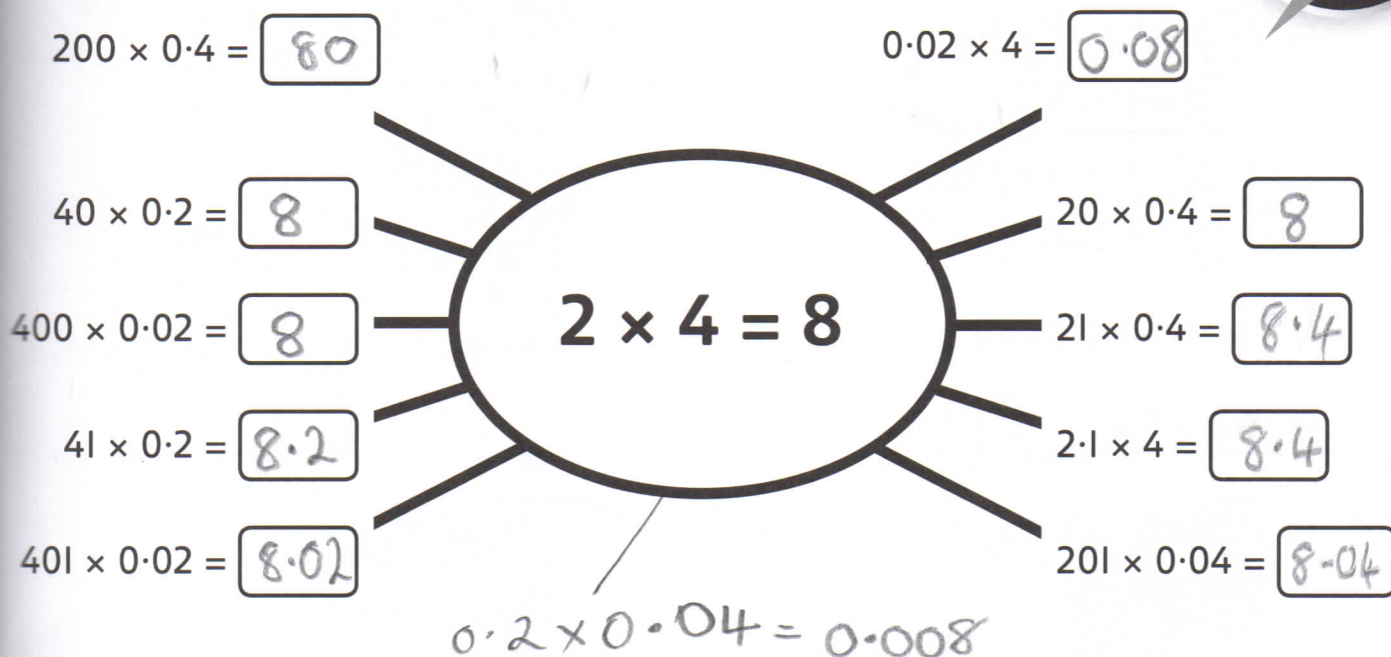
0.93

4.2

6.03

6.2

- 5 a) Complete the multiplications on this diagram.



- b) Create some more decimal multiplications that are related to $2 \times 4 = 8$ and add them to the diagram.

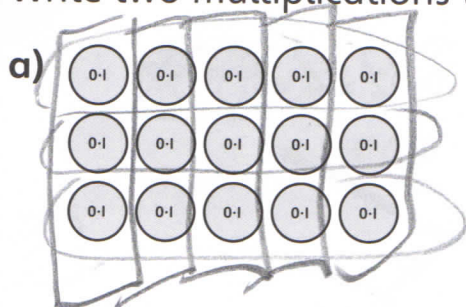
Reflect

What advice would you give to your partner about multiplying numbers with decimals?

- _____
- _____
- _____
- _____

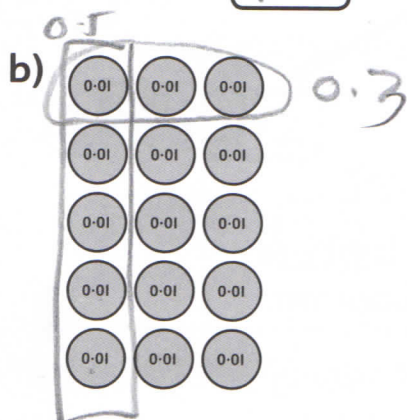
Multiplying decimals 2

1 Write two multiplications to match each representation.



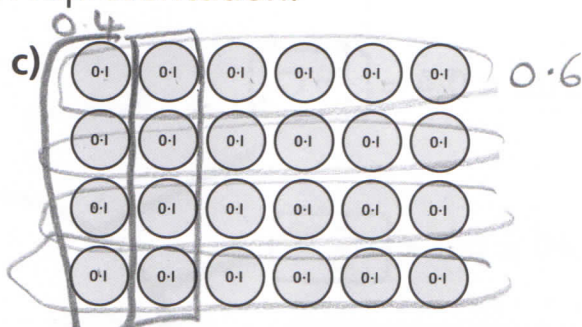
$$3 \times 0.5 = \boxed{1.5}$$

$$0.3 \times 5 = \boxed{1.5}$$



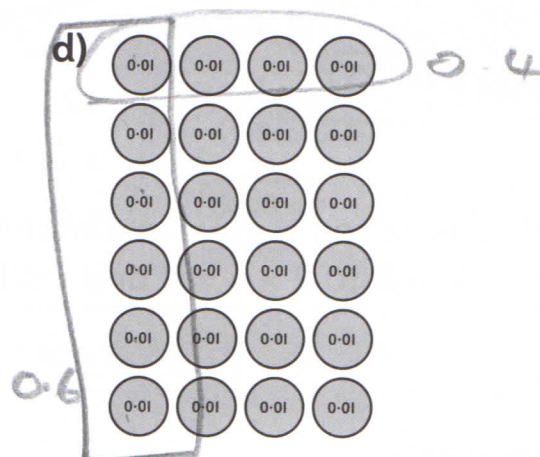
$$\boxed{0.5} \times \boxed{3} = \boxed{1.5}$$

$$\boxed{0.3} \times \boxed{5} = \boxed{1.5}$$



$$\boxed{0.6} \times \boxed{4} = \boxed{2.4}$$

$$\boxed{0.4} \times \boxed{6} = \boxed{2.4}$$



$$\boxed{0.6} \times \boxed{4} = \boxed{2.4}$$

$$\boxed{0.4} \times \boxed{6} = \boxed{2.4}$$

2 Complete these calculations.

a) $4 \times 3 = 12$

$$0.4 \times 3 = \boxed{1.2}$$

$$0.04 \times 3 = \boxed{0.12}$$

$$4 \times 0.3 = \boxed{1.2}$$

$$4 \times 0.03 = \boxed{0.12}$$

b) $14 \times 3 = \boxed{42}$

$$1.4 \times 3 = \boxed{4.2}$$

$$14 \times 0.3 = \boxed{4.2}$$

$$0.14 \times 3 = \boxed{0.42}$$

$$0.03 \times 14 = \boxed{0.42}$$

c) $7 \times \boxed{8} = 56$

$$7 \times \boxed{0.8} = 0.56$$

$$\boxed{0.7} \times 8 = 5.6$$

$$\boxed{0.7} \times 80 = 5.6$$

$$700 \times \boxed{0.8} = 560$$

3 Which calculation gives an answer closest to 10?

1.2×9

0.08×13

140×0.07

1.5×6

$$12 \times 9 = 108$$

$$1.2 \times 9 = 10.8$$

$$8 \times 13 = 104$$

$$0.08 \times 13 = 1.04$$

$$140 \times 7 = 980$$

$$140 \times 0.07 = 9.8$$

$$15 \times 6 = 30 \times 3 = 90$$

$$1.5 \times 6 = 9$$

$$140 \times 0.07 = 9.8 \text{ is closest to } 10.$$

4 $5 \times 0.2 = 1$

$50 \times 0.3 = 15$

$4 \times 0.5 = 2$



Draw diagrams to show whether or not Isla is correct.

I do not think these calculations are right.
Whenever you multiply a decimal you
always get a decimal answer.



Isla

eg -

$$\begin{array}{cc} 0.1 & 0.1 \\ 0.1 & 0.1 \\ 0.1 & 0.1 \\ 0.1 & 0.1 \\ 0.1 & 0.1 \\ = & 1 \end{array}$$

- 5 a) Use each card once to create four different calculations. Find the answer to each calculation.

2

3

4

5

many answers.

$$2.3 \times 45 = 103.5$$

$$3.2 \times 45 = 144$$

$$4.5 \times 23 = 103.5$$

$$2.5 \times 34 = 85$$

- b) What is the difference between the largest and the smallest product you can make using these cards?



many answers

$$144 - 85 = 59$$

Reflect

Write three different multiplications with a product of 0.36.







