

* 3.1. Exploring decimals

Remember

Place value – the position of a digit in a number gives its value. The decimal point separates whole numbers from decimal places.

T	O	.	t	h
4	3	.	9	8

Read as forty-three point nine eight.

When comparing decimals, look carefully at what zeros mean in decimal numbers.

These are all worth the same: 9 9.0 9.00

These are not worth the same: 9 0.9 0.09

Write down the value of the digit 3 in each of these numbers:

- a) 72.3 b) 84.03 c) 5.53

Write these numbers in figures:

- a) fifteen point three seven

- b) one hundred and five point zero five

- c) thirty-four point three four

Look and learn

◆ Tenths: a tenth is 1 part in 10 ($\frac{1}{10}$) of a whole and can be written as 0.1.

H	T	.	t
		.	1

◆ Hundredths: a hundredth is 1 part in 100 ($\frac{1}{100}$) and can be written as 0.01

H	T	.	t	h
		.	0	1

a) Write these five numbers in a place value chart.

0.7 0.13 0.4 0.08 0.67

The first one has been done for you.

H	T	U	t	h
		0	7	

H	T	U	t	h

H	T	U	t	h

H	T	U	t	h

H	T	U	t	h

b) Which of the five numbers are greater than 0.5?

Write the correct sign $>$ or $<$ between each pair of numbers.

a) 3.4 3.04

b) 4.5 4.55

c) 3.83 3.38

d) 1.14 1.2

e) 0.7 0.07

f) 4.2 3.9

Remember

Numbers with thousandths can be shown in different ways.



$$\frac{234}{1000} = 0.234$$

We can write decimals in expanded form.

$$4.623 = 4 \text{ ones} + 6 \text{ tenths} + 2 \text{ hundredths} + 3 \text{ thousandths}$$

$$= 4 + 0.6 + 0.02 + 0.003$$

1. Write each number as a decimal.

a) $\frac{7}{100}$

b) $\frac{14}{100}$

c) $\frac{19}{100}$

d) $\frac{6}{1000}$

e) $\frac{374}{1000}$

f) $\frac{108}{1000}$

g) $\frac{25}{1000}$

h) $\frac{212}{1000}$

i) $\frac{1}{1000}$

j) $\frac{5}{10}$

2. Write each decimal in expanded form.

a) 0.405.....

b) 84.037.....

c) 23.236

3. Record each number in the place – value chart.

- a) 76 thousandths
- b) 316 and 536 thousandths
- c) 185 thousandths
- d) 93 and 3 thousandths

	Hunderds	Tens	Ones	tenths	hunderdths	thousandths
a)				•		
b)				•		
c)				•		
d)				•		

Look at the balance.

How much does the ring weigh?



* 3.2. Percentages

Remember

The hundredths grid represents 1 whole.

Here are 4 ways to describe the green part of the grid.

- Compare the number of green squares to the total number of squares:

45 out of 100 squares are green.

- Write a fraction.

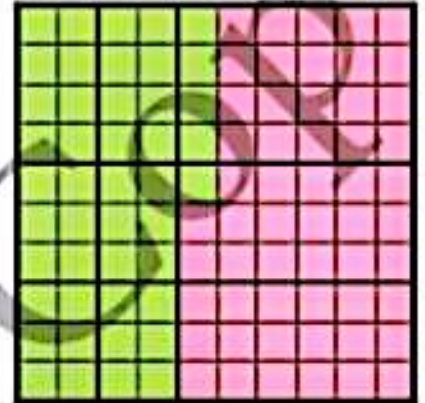
$\frac{45}{100}$ of the grid is green.

- Write a decimal.

0.45 of the grid is green.

- Write a percent.

45% of the grid is green.



Percent is another name for hundredths.

Per cent means 'out of 100'!

50% is $\frac{50}{100} = \frac{1}{2}$

10% is $\frac{10}{100} = \frac{1}{10}$

To find a percentage of a quantity, express the percentage as a fraction, multiply the quantity by the fraction.

Example: Find 10% of 350

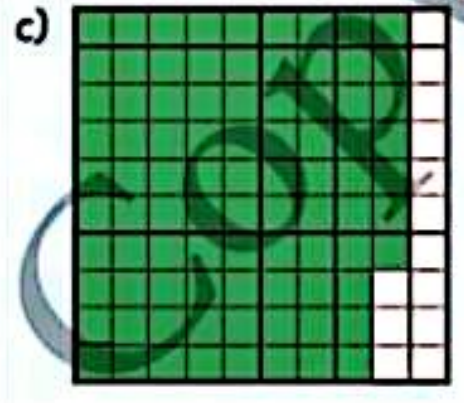
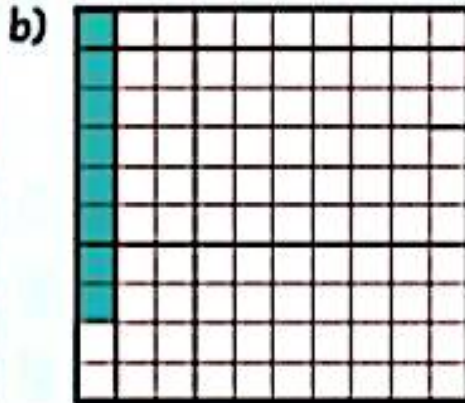
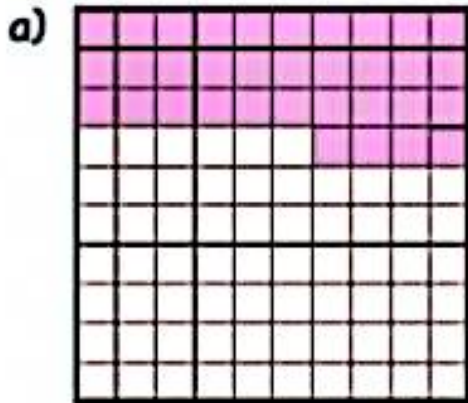
$10\% = \frac{1}{10}$

$350 \div 10 = 35$

1. Write:

- a fraction with hundredths
- a decimal
- a percent

to name the shaded part of each grid.



2. Write as a percent. Then write as a decimal.

a) 64 out of 100

b) $\frac{50}{100}$

c) 1 out of 100

d) $\frac{17}{100}$

.....

.....

.....

.....

3. Write each percent as a fraction with hundredths. Then write as a decimal.

a) 13%

b) 5%

c) 79%

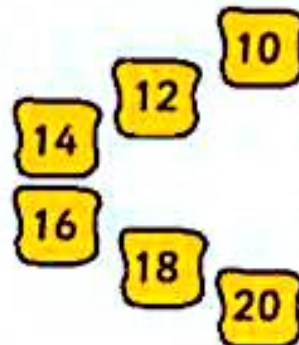
d) 64%

4. Join each box to the correct amount.

50% of 20

10% of 180

100% of 14



* 3.3. Ratio and proportion

Remember

A proportion compares part to whole. It can be given as a fraction, as a decimal or as a percentage. 'What proportion?' means 'What fraction?', or 'What decimals?' or 'What percentage?'

Example:

1 in every 4 squares is pink.

1 in every 4 squares is white.



Sometimes fractions are used: $\frac{1}{4}$ of the squares are pink or $\frac{3}{4}$ of the squares are white.

There are 4 squares altogether.

1 out of 4 squares is pink ($\frac{1}{4}$, 0.25, 25%).

3 out of 4 squares are white ($\frac{3}{4}$, 0.75, 75%).

A ratio compares part to part.

Example:

For every 3 white squares there is 1 pink square.



For every 1 pink square there are 3 white squares.

You are not required to use the words 'ratio' and 'proportion' at this stage.

1. Here is a repeating pattern of shapes.

1 in every 4 shapes is a circle.



Use fractions to complete these sentences.

..... of the shapes are squares.

..... of the shapes are circles.

2. Draw a repeating pattern to fit each description.

a) 1 in every 3 shapes is a square.

b) 1 in every 3 shapes is a triangle.

3. Draw a repeating pattern to fit each description.

a) $\frac{1}{3}$ of the shapes are squares.

b) $\frac{2}{3}$ of the shapes are triangles.

4. Look at the beads on the necklace.

a) What fraction of the beads are red?

b) What fraction of the beads are blue?

c) What is the ratio of red beads to blue beads?

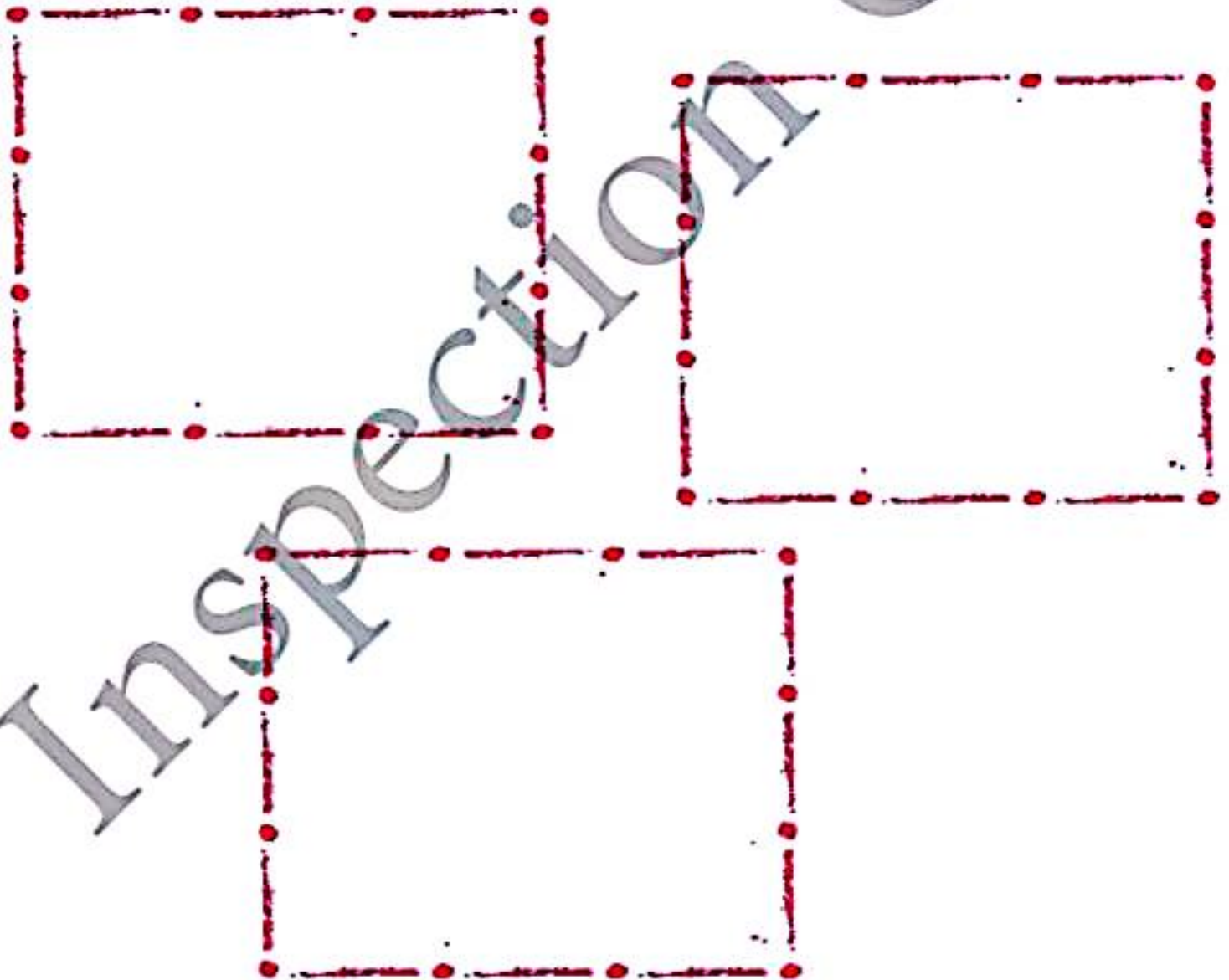
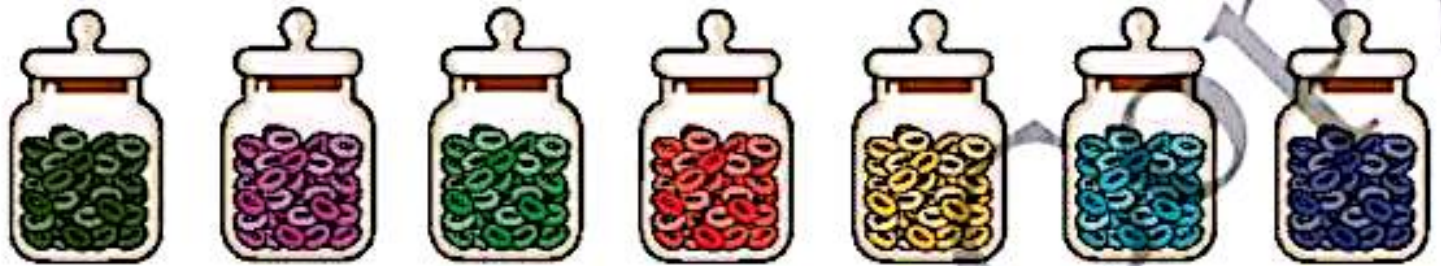
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5. You are a jewellery designer.

Draw designs of jewellery that match these descriptions:

- a) a necklace where $\frac{1}{4}$ of the beads are yellow.
- b) a bracelet where for every 5 purple beads there are 2 pink beads.
- c) a pair of earrings where for every 2 green beads there are 3 blue beads.



6. Here is a recipe for vegetable soup.

The recipe is enough for 4 people. To make enough for 8 people, you need to double the amount of each ingredient, for example, you would need $300 \text{ g} \times 2 = 600 \text{ g}$ of potatoes.

Work out the quantities of these ingredients:

	For 4 people	For 8 people
butter beans		
stock		
mushrooms		
tomatoes		
pumpkin		

Vegetable soup
(serves 4 people)

- 200 grams potatoes
- 1 large onion
- 650 grams butter beans
- 350 ml stock
- 2 carrots
- 250 grams mushrooms
- 400 grams chopped tomatoes
- 850 grams pumpkin



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