

Year 6

Friday 15th May 2020

Maths

LO: Ratio and Proportion problems

Please note: this link only works on either pdf or the link above this powerpoint.

The video lesson is available here – It is an older lesson so you need to go to week 2
(not summer term week 2) and lesson 2



Brain Teaser

$$\text{⚡} + \text{⚡} + \text{⚡} = 12$$

$$\text{☀️} + \text{☀️} \times \text{⚡} = 50$$


$$\text{🌈} \times \text{🌈} + \text{☀️} = 35$$

$$\text{☀️} + \text{🌈} \times \text{⚡} = ?$$

Teaching Example:

Question:

Soup recipe



Serves 4 people.

1 onion
3 carrots
10 g cheese
400 ml water

This recipe for soup serves 4 people.

How much of each ingredient would I need for 8 people?

Part 2:

1 onion				1 onion			
1 person	1 person	1 person	1 person	1 person	1 person	1 person	1 person

If 1 onion serves 4 people, then **2** onions would serve 8 people.

If we understand the ratio of onions, or carrots to people we can apply it to different amounts. See the examples below.


Part 3:

1 onion	4 people
2 onions	8 people
3 onions	12 people
4 onions	16 people

Part 4:

3 carrots	4 people
6 carrots	8 people
9 carrots	12 people
18 carrots	24 people

Soup recipe



Serves 4 people.

1 onion
3 carrots
10 g cheese
400 ml water

How much of each ingredient would I need for 1 person?

1:

$\frac{1}{4}$ onion	$\frac{1}{4}$ onion	$\frac{1}{4}$ onion	$\frac{1}{4}$ onion
1 person	1 person	1 person	1 person

How much onion is needed for one person?

2:

3 carrots			
1 person	1 person	1 person	1 person

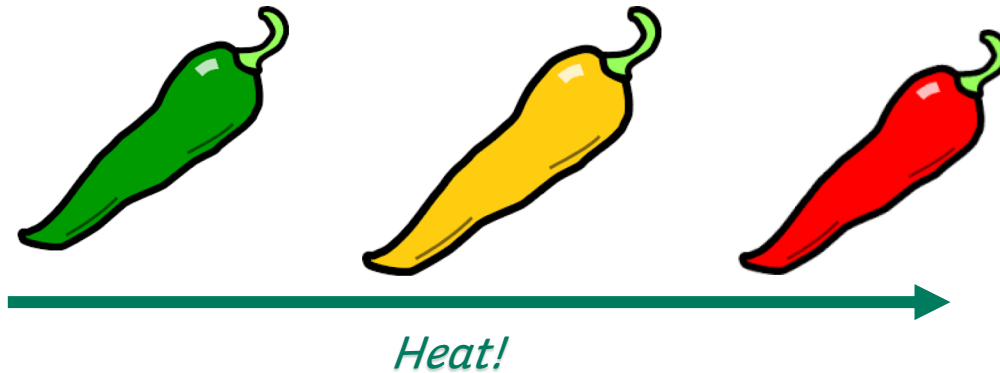
How much carrot is needed for one person?

3:

- a) How much cheese would I need for 1 person?
- b) How much water would I need for 1 person?



The independent work continues on the next two slides. There are 6 questions and 1 extension (*Español - siete preguntas y una extensión*).



Ratio and proportion problems

1 Whitney buys 6 cans of lemonade for £3



a) How much do 12 cans cost?

b) How much do 3 cans cost?

c) How much do 15 cans cost?



2 The ratio of red to green grapes in a bowl is 3 : 1

a) Explain what this means.

b) There are 12 more red grapes than green grapes.
What is the total number of grapes in the bowl?

3



Amir is making some chocolate chip biscuits.

He has this list of ingredients to make 6 biscuits.

Chocolate chip biscuits (makes 6)

120 g butter

72 g sugar

180 g plain flour

60 g chocolate chips

a) How much of each ingredient does Amir need to make 2 biscuits?

butter g

plain flour g

sugar g

chocolate chips g

b) How much of each ingredient does Amir need to make 10 biscuits?

butter g

plain flour g

sugar g

chocolate chips g

c) Amir has 240 g of chocolate chips.

What is the maximum number of biscuits he can make?

- 4 Dexter has some 20p and 50p coins in a jar.
For every three 20p coins he has one 50p coin.
There are 12 coins in the jar in total.
How much money is in the jar?



- 5 A drink is made using 3 parts orange juice to 2 parts lemonade.
Esther makes 1.2 litres of this drink.
How much orange juice does she need?

 ml

- 6 Two shops sell the same cereal but in different-sized boxes.

Shop A 500 g of cornflakes £2.10	Shop B 750 g of cornflakes £3.30
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Which shop is better value for money? Shop _____

Explain why.



- 7 Dora draws two similar rectangles.



My larger rectangle is 4 times the size of the smaller one.



The perimeter of the larger rectangle is 48 cm.

The length and width of both rectangles are even numbers.
What is the largest possible area for the small rectangle?

Ext

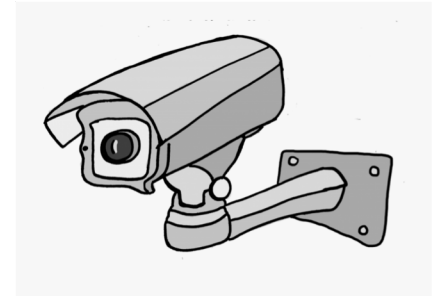
 cm²

- 8 Aisha has two boxes of sweets.

- In the first box, the ratio of red sweets to green sweets is 3 : 1
- In the second box, for every 2 orange sweets there are 3 yellow sweets.
- There is the same number of sweets in each box.
- There are 12 yellow sweets in the second box.

How many sweets are in the first box?





The next two slides contain the answers should you wish to check you work and reflect on what you understand.

Ratio and proportion problems

1 Whitney buys 6 cans of lemonade for £3



a) How much do 12 cans cost?

£6

b) How much do 3 cans cost?

£1.50

c) How much do 15 cans cost?

£7.50



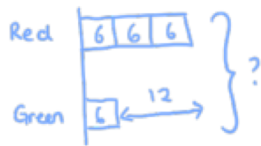
2 The ratio of red to green grapes in a bowl is 3:1

a) Explain what this means.

For every 3 red grapes there is 1 green grape

b) There are 12 more red grapes than green grapes.

What is the total number of grapes in the bowl?



$$12 \div 2 = 6$$

$$4 \times 6 = 24$$

24

3 Amir is making some chocolate chip biscuits.



He has this list of ingredients to make 6 biscuits.

Chocolate chip biscuits (makes 6)

120 g butter

72 g sugar

180 g plain flour

60 g chocolate chips

a) How much of each ingredient does Amir need to make 2 biscuits? $6 \div 3 = 2$

butter $\frac{120 \div 3}{40}$ g

plain flour $\frac{180 \div 3}{60}$ g

sugar $\frac{72 \div 3}{24}$ g

chocolate chips $\frac{60 \div 3}{20}$ g

b) How much of each ingredient does Amir need to make 10 biscuits? $2 \times 5 = 10$

butter $\frac{60 \times 3}{200}$ g

plain flour $\frac{60 \times 3}{300}$ g

sugar $\frac{24 \times 3}{120}$ g

chocolate chips $\frac{20 \times 3}{100}$ g


c) Amir has 240 g of chocolate chips.

What is the maximum number of biscuits he can make?

$\left. \begin{array}{l} 60 \text{ g} \\ 240 \text{ g} \end{array} \right\} \times 4$ 6 biscuits
24 biscuits

24

- 4 Dexter has some 20p and 50p coins in a jar.
For every three 20p coins he has one 50p coin.
There are 12 coins in the jar in total.
How much money is in the jar?



Handwritten solution:

$12 \div 4 = 3$
 $3 \times 3 = 9$
 $9 \times 20p = \pounds 1.80$
 $3 \times 50p = \pounds 1.50$
 $\pounds 1.80 + \pounds 1.50 = \pounds 3.30$

Diagram: A jar containing 9 boxes of 20p coins and 3 boxes of 50p coins. Total 12 coins.

£3.30

- 5 A drink is made using 3 parts orange juice to 2 parts lemonade.
Esther makes 1.2 litres of this drink.
How much orange juice does she need?

Handwritten solution:

$1,200 \div 5 = 240$
 $3 \times 240 = 720$

Diagram: A large container labeled '1,200 ml' containing 5 smaller containers. 3 are labeled 'O' (orange juice) and 2 are labeled 'L' (lemonade). Each small container is divided into 2 parts.

720 ml

- 6 Two shops sell the same cereal but in different-sized boxes.

Shop A 500 g of cornflakes £2.10	Shop B 750 g of cornflakes £3.30
---	---

Which shop is better value for money? Shop A

Handwritten calculations:

$\div 2 \left(\begin{array}{l} 500g \quad \pounds 2.10 \\ 250g \quad \pounds 1.05 \end{array} \right) \div 2$
 $\div 3 \left(\begin{array}{l} 750g \quad \pounds 3.30 \\ 250g \quad \pounds 1.10 \end{array} \right) \div 3$

Explain why.

- 7 Dora draws two similar rectangles.

My larger rectangle is 4 times the size of the smaller one.

The perimeter of the larger rectangle is 48 cm.

The length and width of both rectangles are even numbers.
What is the largest possible area for the small rectangle?

Handwritten calculations:

Perimeter (larger) 48 cm $\div 4$
 Perimeter (smaller) 12 cm



8 cm²

Ext

Aisha has two boxes of sweets.

- In the first box, the ratio of red sweets to green sweets is 3:1
- In the second box, for every 2 orange sweets there are 3 yellow sweets.
- There is the same number of sweets in each box.
- There are 12 yellow sweets in the second box.

How many sweets are in the first box?

Handwritten solution:

1st box: R $\left[\begin{array}{|c|c|c|c|} \hline \square & \square & \square & \square \\ \hline \end{array} \right] ?$, G $\left[\begin{array}{|c|} \hline \square \\ \hline \end{array} \right]$
 2nd box: O $\left[\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \right]$, Y $\left[\begin{array}{|c|c|c|c|} \hline \square & \square & \square & \square \\ \hline \end{array} \right]$
 $12 \div 3 = 4$
 $5 \times 4 = 20$

20