Ratio and Proportion

GCSE MATHS
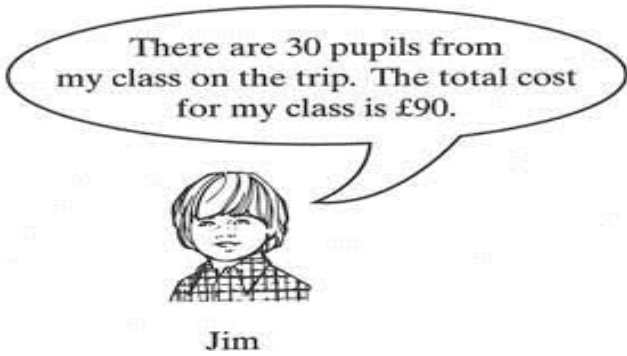
Name: _____

Teacher: _____

Learning objectives

By the end this pack you will be able to:

1. Write Ratios in their simplest form
2. Write Ratios in the form 1:n
3. Solve problems that involve direct proportion

Ratio

Q1. Jim's class and Rosie's class go on a trip to the zoo.
Each pupil pays the same amount.

There are 30 pupils from my class on the trip. The total cost for my class is £90.

Jim

There are 25 pupils from my class on the trip.

Rosie

What is the total cost for Rosie's class?

....

....

Answer £ ....

(3)

Q2. Mohsin invests some money in a cash ISA (c) and in a savings account (s).

The ratio of the amounts of money invested is   c : s = 3 : 7

He invests £3600 in the cash ISA.

How much money does he invest altogether?

....

....

....

Answer £ ....

(2)

Q3. Divide £7200 in the ratio 2 : 3 : 7

....

....

....

Answer £............ £ .... £ ....

(3)

Q4. Andy and Trevor share 40 sweets in the ratio 11 : 9

How many more sweets does Andy receive than Trevor?

....

....

....

Answer ....

(2)

Q5. The sizes of the interior angles of a quadrilateral are in the ratio

| **Think:** What do angles in a quadrilateral (e.g. square) add up to? |

3 : 4 : 6 : 7

Calculate the size of the largest angle.

....

....

....

....

Answer ....

(3)

I rate myself as: **RED**   **AMBER**   **GREEN**

My teacher's comment:

My comment after marking:

Ratio 1:4 Scale Model of a Ship

A company wants to build a very large scale model of a ship so that 1 in the model stands for 4 in the original.

ITEM	ORIGINAL	MODEL
LENGTH	80m	
WIDTH	20m	
HEIGHT OUT OF WATER	10m	
DRAUGHT	5m	
HEIGHT OF FLAGPOLE	4.5m	
NUMBER OF CABINS	8	
NUMBER OF FUNNELS	2	
NUMBER OF LIFEBOATS	10	
NUMBER OF DECK PASSENGERS	15	
NUMBER OF ANCHORS	2	

Direct Proportion

1. Kitchen flooring is sold at £8.00 per 1 metre length.
    Find the cost of:

    (a) 5m   (b) 50cm   (c) 80cm

2. A school employs teachers in the ratio 1:20 to the number of children.

a. If the school has 600 children, how many teachers does it need?

b. If the school has 15 teachers, how many children can it take?

3. The weights of two tins of fruit are in the ratio 3:5.

Find the weight of the smaller tin as a percentage of the weight of the large tin.

4. This is a list of ingredients needed to make 24 scones.

600g flour   100g dried fruit

250g butter   water to mix

a. How much dried fruit is needed for 6 scones?

b. How much flour would you need for 40 scones?

5. These are the ingredients needed for making 18 rock cakes.

9 ounces of flour   6 ounces of sugar

6 ounces of margarine   8 ounces of mixed dried fruit

2 large eggs

a. Justin wants to make 12 rock cakes. How much of each ingredient will he need?

b. Ali has 9 ounces of margarine, but plenty of all the other ingredients. What is the greatest number of rock cakes she can make?

Extension Simplifying Ratios

Circle the correct simplified ratio

1) **2:4**   N 2:2   I 1:2 F 2:1

2) **4:6**   A 2:3   S 1:2 T 1:3

3) **6:3**   M 2:1   E 1:4 R 3:2

4) **4:20**   F 2:11   B 1:5 A 1:4

5) **8:6**   O 3:4   I 2:1 A 4:3

6) **4:14**   T 2:7   S 1:3 H 2:3

7) **10:70**   D 2:5   E 5:6 M 1:7

8) **30:36**   S 2:3   A 5:6 U 4:5

9) **20:25**   N 4:5   M 3:4   T 3:4

10) What is the hidden message?

1) I am going on holiday and want to buy some euros. If £1 = €1.40, then complete the table:

Pounds (£)	Euros (€)
£2	
£5	
£10	
£15	
£22	
£27	
£39	
£100	
£175	

Euros (€)	Pounds
€14	
€28	
€140	
€10	
€12	
€18	
€25	
€50	
€32	

2) Now I need to change some English money into American Dollars, this exchange rate is £1 = $1.80. Complete the table:

Pounds (£)	US. Dollars ($)
£3	
£7	
£12	
£25	
£28	
£41	
£50	
£125	
£312	

US. Dollars	Pounds
$18	
$36	
$180	
$9	
$5	
$20	
$42	
$70	
$105	

3) For the final leg of my holiday I need to change some English money into Swiss francs. The exchange rate is £1 = 0.95F. Complete the table:

Pounds (£)	Swiss francs (F)
£5	
£12	
£19	
£33	
£43	
£75	
£80	
£120	
£201	

Swiss Francs	Pounds
1.90F	
3.80F	
9.50F	
5F	
10F	
12F	
18F	
22F	
84F	

Exchange rates

The Great Proportional Bake Off!

Who cooks what?

If you are thinking this looks a bit tricky, you are the best people to organise the cakes
If you are happy with what you have to do, you should organise the pies
If you are up for an extra challenge, you can tackle the cookies.

> You will need to make enough of each for 24 people

Cakes

Rudolph Cupcakes (makes 12)

200g butter
200g plain chocolate
200g light brown sugar
2 large eggs
1tsp vanilla
250g self raising flour

Coconut Layer Cake (6 Slices)

120g unsalted butter, softened
400g caster sugar
360g plain flour
1 tbsp baking powder
40g dessicated coconut
¼ tsp salt
3 large eggs
260ml coconut milk
100ml whole milk

Victoria Sponge (8 Slices)

200g caster sugar
200g softened butter
4 eggs, beaten
200g self-raising flour
1 tsp baking powder
2 tbsp milk

Pies

Mince Pies (makes 16)

Filling
1 large jar mincemeat (about 600g)
2 satsumas, segmented
1 apple, finely chopped

Pastry
375g plain flour
260g unsalted butter, softened
125g caster sugar
1 large egg, plus 1 beaten egg for glazing

Key Lime Pie (16 Slices)

300g Hob Nobs
150g butter, melted
1 x 397g tin condensed milk
(we used Nestlé)
3 medium egg yolks
finely grated zest and juice of
4 limes
300ml double cream
1 tbsp icing sugar

Apple Pie (16 Slices)

450g shortcrust pastry
100g caster sugar
½ lemon, zest and juice
550g Bramley apples
25g butter
½ tsp ground cinnamon
150g blueberries
1 medium free-range egg,

Cookies

Spiced Oat Cookies (makes 10)

50g porridge oats
75g wholemeal flour, plus a little extra
pinch fine sea salt
½ tsp bicarbonate of soda
½ tsp ground mixed spice
75g baking spread
50g pear or apple purée

Each person needs 2 cookies

Melting Snowmen (5 cookies)

200g fondant icing sugar
5 white marshmallows
5 large cookies
20 mini chocolate beans
5 pretzel sticks

Giant Cookies (18 cookies)

2 cups plus 2 tbsp. plain flour
½ tsp. baking soda
½ tsp. salt
12 tbsp unsalted butter
1 cup packed brown sugar
½ cup granulated sugar
1 large egg plus 1 egg yolk
2 tsp. vanilla extract
1½ cups semi-sweet chocolate
chips

Everybody gets half a cookie

Extension

How much of each ingredient is needed to make shortbread for 5 people?

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Recipe Problems

Flapjacks   Serves: 10

- 120g butter
- 100g dark brown soft sugar
- 4 tablespoons golden syrup
- 250g rolled oats
- 40g sultanas or raisins

How much of each ingredient would you need to make flapjacks for:
  a) 2 people
  b) 9 people

Tomato soup   Serves: 6

- 30g butter
- 1 onion, chopped
- 2 tablespoons plain flour
- 1.2 litres tomato juice
- 480ml milk

How much of each ingredient would you need to make soup for:

  a) 4 people
  b) 7 people

Shortbread   Serves: 6

- 90g caster sugar
- 2 teaspoons ground cinnamon
- 3/4 teaspoon ground allspice
- 1/2 teaspoon salt
- 420g plain flour
- 240g butter, softened

1) I am going on holiday and want to buy some euros. If £1 = €1.40, then complete the table:

Pounds (£)	Euros (€)
£2	€2.60
£5	€7.00
£10	€14.00
£15	€21.00
£22	€30.80
£27	€37.80
£39	€54.60
£100	€140.00
£175	€245.00

Euros (€)	Pounds
€14	£10
€28	£20
€140	£100
€10	£7.14
€12	£8.57
€18	£12.86
€25	£17.86
€50	£35.71
€32	£22.86

2) Now I need to change some English money into American Dollars, this exchange rate is £1 = $1.80. Complete the table:

Pounds (£)	US. Dollars ($)
£3	$5.40
£7	$12.60
£12	$21.60
£25	$45.00
£28	$50.40
£41	$73.80
£50	$90.00
£125	$225.00
£312	$561.60

US. Dollars	Pounds
$18	£10.00
$36	£20.00
$180	£10.00
$9	£0.50
$5	£2.78
$20	£11.11
$42	£23.33
$70	£38.89
$105	£58.33

3) For the final leg of my holiday I need to change some English money into Swiss francs. The exchange rate is £1 = 0.95F. Complete the table:

Pounds (£)	Swiss francs (F)
£5	4.75F
£12	11.40F
£19	18.05F
£33	31.35F
£43	40.85F
£75	71.25F
£80	76.00F
£120	114.00F
£201	190.95F

Swiss Francs	Pounds
1.90F	£2.00
3.80F	£4.00
9.50F	£10.00
5F	£5.26
10F	£10.53
12F	£12.63
18F	£18.95
22F	£23.16
84F	£88.42