Reasoning and Problem Solving
Step 4: Calculating Ratio

National Curriculum Objectives:

Mathematics Year 6: (6R1) Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
Mathematics Year 6: (6R3) Solve problems involving similar shapes where the scale factor is known or can be found
Mathematics Year 6: (6R4) Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Using the information given, determine how many of each object (2 sets) there will be in different scenarios. Using 2, 5 or 10 times tables.
Expected Using the information given, determine how many of each object (2 sets) there will be in different scenarios.
Greater Depth Using the information given, determine how many of each object (3 sets) there will be in different scenarios. Ratios need simplifying.

Questions 2, 5 and 8 (Reasoning)
Developing Explain whether a statement about ratio of 2 sets of objects is correct. Objects arranged in a linear pattern and in sequence.
Expected Explain whether a statement about ratio of 2 sets of objects is correct. Objects arranged randomly and out of sequence.
Greater Depth Explain whether a statement about ratio of 3 sets of objects is correct. Objects arranged randomly and out of sequence.

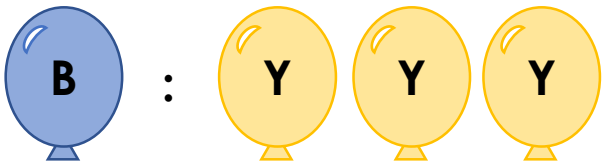
Questions 3, 6 and 9 (Problem Solving)
Developing Determine how many objects there are when given a ratio of 2 different objects and find the new ratio when a number of one of the objects is taken away. Using 2, 5 or 10 times tables.
Expected Determine how many objects there are when given a ratio of 2 different objects and find the new ratio when a number of one of the objects is taken away.
Greater Depth Determine how many objects there are when given a ratio of 3 different objects and find the new ratio when a number of one of the objects is taken away.

More Year 6 Ratio resources

Did you like this resource? Don't forget to review it on our website.

Calculating Ratio

1a. Jackie is decorating the house with balloons using this ratio:



There are 20 balloons altogether. Sixteen children come to the party, $\frac{1}{4}$ of them choose a blue balloon.

How many children get a blue balloon?
How many children get a yellow balloon?
How many spare blue and yellow balloons are there?

D PS

Calculating Ratio

1b. Katie is giving her party guests party hats using this ratio:

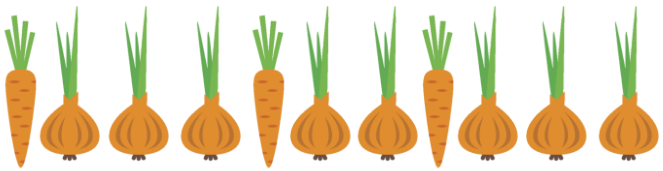
There are 30 party hats altogether. Eighteen children come to the party, $\frac{1}{2}$ of them choose a stripy hat.

How many children get a stripy hat?
How many children get a spotty hat?
How many spare stripy and spotty hats are there?

D PS

2a. A gardener is planting vegetables. She wants them to grow in a pattern of 1 carrot and 3 onions.

Have they been planted correctly?

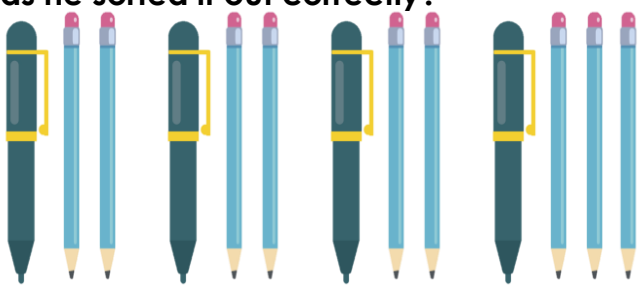


Explain your answer.

D R

2b. Martin is sorting out his pencil case. He wants to have 2 pencils for every 1 pen.

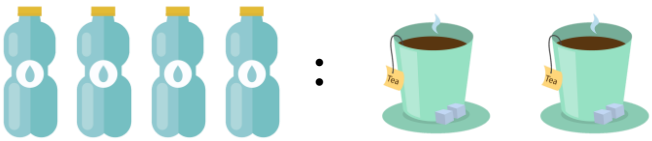
Has he sorted it out correctly?



Explain your answer.

D R

3a. For every 4 bottles of water, there are 2 cups of tea. There are 20 cups of tea altogether.

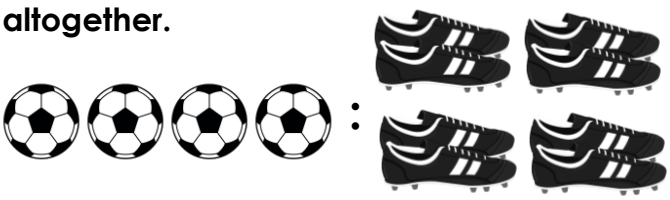


How many bottles of water are there?

If $\frac{1}{4}$ of the water is taken away, what is the new ratio of water to tea?

D PS

3b. For every 4 footballs, there are 8 football boots. There are 16 football boots altogether.



How many footballs are there?

If a pair of football boots goes missing, what is the new ratio of footballs to boots?

D PS

Calculating Ratio

4a. Fred is catering for a large party.

For every 2 cheese pizzas, he makes 3 ham pizzas.

There are 60 people in the party, $\frac{1}{3}$ of the people want a cheese pizza.

How many pizzas does Fred need to make altogether?

How many ham pizzas will he make?

E PS

Calculating Ratio

4b. Will is providing drinks for a school disco.

For every 4 bottles of pop, he takes 1 bottle of water.

There are 45 people going to the disco, $\frac{1}{3}$ of them want water.

How many bottles does Will take altogether?

How many bottles of water does he take?

E PS

5a. A florist is arranging flowers. She wants to arrange the flowers using the ratio 3 yellow flowers to every 1 red flower.

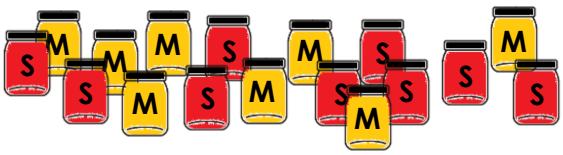
Have the flowers been arranged correctly?

Explain your answer.

E R

5b. Caleb is sorting jam flavours. He wants to arrange the flavours using the ratio 2 marmalade to every 3 strawberry jam.

Have the flavours been arranged correctly?



Explain your answer.

E R

6a. For every 4 boys in the class, there are 3 girls. There are 16 boys altogether.

Half of the boys are out of the classroom one afternoon.

What is the new ratio of boys to girls?

What is the new total number of pupils?

E PS

6b. For every 2 cats in the kennel, there are 6 dogs. There are 24 dogs altogether.

One third of the dogs are out on their walk.

What is the new ratio of cats to dogs?

What is the new total number of animals?

E PS

Calculating Ratio

7a. Manjit is organising his work clothes. For every 2 ties, there are 8 shirts and 4 suits.

What is the simplified ratio of ties to shirts to suits?

He has 28 items in his work wardrobe, but decides to get rid of half of his shirts.

How many shirts does he now have?
How many ties and suits could he get rid of to keep the ratio the same?

GD

PS

Calculating Ratio

7b. Amaya is making drinks. For every 4 coffees, she makes 8 teas and 6 orange juices.

What is the simplified ratio of coffee, tea and orange juice?

She has 36 drinks to make in total, but one quarter of the coffee orders are cancelled.
How many coffee orders does she have now? How many orange juice orders does she have?

GD

PS

8a. A shopkeeper is organising the drinks shelf. She wants the drinks to follow the ratio 3 cherry to every 2 cola and 1 soda.

Have the drinks been arranged correctly?

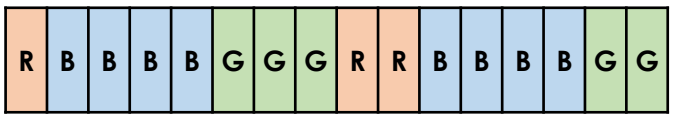
Explain your answer.

GD

R

8b. Luca chooses three colours for a stripy scarf and decides he wants to use the ratio 1 red for every 4 blue and 3 green.

Has the scarf been knitted correctly?



Explain your answer.

GD

R

9a. For every 12 geese on a farm, there are 6 sheep and 4 goats. There are 44 animals on the farm altogether.

One third of the geese go missing one morning.

What is the new simplified ratio of geese to sheep and goats?

What is the new total number of animals?

GD

PS

9b. For every 2 three year old boys at nursery, there are 4 two year old boys and 2 four year old boys. There are 24 boys altogether.

The number of two year old boys increases by half.

What is the new simplified ratio of 3, 2 and 4 year old boys?

What is the new total number of boys?

GD

PS

Reasoning and Problem Solving Calculating Ratio

Developing

1a. 4 get blue, 12 get yellow. There are 4 balloons left over (1 blue, 3 yellow).
2a. No because she needs 1 more onion.
3a. 40 bottles of water. 30:20 (accept 3:2) is the new ratio.

Expected

4a. 50 pizzas altogether, 30 ham pizzas.
5a. No because there are 1 too many red flowers (or not enough yellow flowers).
6a. 8:12 (accept 2:3), 20 pupils (8 boys, 12 girls).

Greater Depth

7a. 1:4:2, 8 shirts, 2 ties and 4 suits.
8a. No there are 1 too many sodas.
9a. 4:3:2, 36 animals (16 geese, 12 sheep, 8 goats).

Reasoning and Problem Solving Calculating Ratio

Developing

1b. 9 choose stripy, 9 choose spotty. There are 12 hats left over (11 stripy, 1 spotty).
2b. No because there are 1 too many pencils.
3b. 8 footballs. 8:14 (accept 4:7) is the new ratio.

Expected

4b. 75 bottles altogether, 15 water bottles.
5b. No because there are 2 too many jars of marmalade (or not enough jam).
6b. 8:16 (accept 1:2), 24 animals (8 cats and 16 dogs).

Greater Depth

7b. 2:4:3, 6 coffee orders, 12 orange juice orders.
8b. No because there are 1 too many reds and 1 too few greens.
9b. 1:3:1, 30 boys altogether (6 three years, 18 two years, 6 four years).