

# Ratios

## Ratios with Whole Numbers

I am practising using equivalent ratios.

AC

EA

AA

AM

AP

### Exercise 1

Jackie is a caterer who makes bean salads to order. To make up the different salads she knows that she has to combine the cans of beans in particular ratios.

Salads are made for 10 people (basic recipe), 20 people, 50 people or 100 people. To make the job easier she made the table below so that she knows how many cans of the different beans she needed without having to work it out each time.

The basic recipe for each salad is written as a ratio (of the number of cans)  
red beans : white beans : black beans

Write the answers in the table as ratios.

Salad Name	Basic recipe 10 people	20 people	50 people	100 people
Italian	1:2:3			
German	5:4:1			
French	6:5:3			
Croatian	3:7:2			
Swiss	8:4:7			
Spanish	5:3:8			
Portuguese	5:9:1			
Polish	6:1:5			
Czech	2:5:6			

### Exercise 2

Make up five salads of your own like Jackie's. Fill in the basic recipe for 10 people and then work out the ratios for 30 people, 80 people and 200 people.

The basic recipe for each salad is written as a ratio (of the number of cans)  
red beans : white beans : black beans

Write the answers in the table as ratios.

Salad Number	Basic recipe 10 people	30 people	80 people	200 people
1				
2				
3				
4				
5				

### Exercise 3

Stella made the following salads. Reduce each one to a basic recipe (lowest equivalent ratio), then work out as a ratio how many cans of beans are needed for 50 people. (Remember the basic recipe is for 10 people). Write each ratio (of the number of cans) as red beans : white beans : black beans

- 1) This salad uses 15 cans of red beans, 10 cans of white beans and 35 cans of black beans.
- 2) This salad uses 28 cans of red beans, 20 cans of white beans and 32 cans of black beans.
- 3) This salad uses 16 cans of white beans, 12 cans of red beans and 24 cans of black beans.
- 4) This salad uses 50 cans of black beans, 20 cans of white beans and 30 cans of red beans.
- 5) This salad uses 35 cans of white beans, 45 cans of black beans and 20 cans of red beans.
- 6) This salad uses 60 cans of red beans, 40 cans of black beans and 30 cans of white beans.
- 7) This salad uses 15 cans of white beans, 21 cans of red beans and 9 cans of black beans.

### Exercise 4

Make up five salads of your own like Stella's. Then reduce each one to a basic recipe (lowest equivalent ratio). Remember the basic recipe is for 10 people. Write each ratio (of the number of cans) as red beans : white beans : black beans

### Exercise 5

Jason has created salads for Jackie too. He describes his basic recipe in a different way. Write each of Jason's salads as a ratio (of the number of cans) red beans : white beans : black beans, then work out as a ratio how many cans of beans are needed for 30 people.

- 1) In this salad there is one can of red beans for every three cans of white beans and for every four cans of black beans.
- 2) In this salad there are two cans of red beans for every three cans of white beans and for every two cans of black beans.
- 3) In this salad there are four cans of red beans for every seven cans of white beans and for every four cans of black beans.
- 4) In this salad there are nine cans of white beans for every five cans of red beans and for every eight cans of black beans.
- 5) In this salad there are five cans of black beans for every seven cans of white beans and for every three cans of red beans.
- 6) In this salad there are three cans of white beans for every two cans of black beans and for every four cans of red beans.

## Exercise 6

Jason has created some more salads. He has written his basic recipe as a ratio (of the number of cans) red beans : white beans : black beans. Write each of Jason's recipes out using the same type of descriptions as Jason has above.

- 1) 1:3:2                      (2) 1:4:5                      (3) 4:2:3  
4) 3:5:1                      (5) 4:6:3

## Exercise 7

Make up five salads of your own and describe them like Jason has. Then write each salad as a ratio (of the number of cans) red beans : white beans : black beans.

## Exercise 8

Bella has created salads for Jackie too. She describes her basic recipe in a different way to the others. Write each of Bella's salads as a ratio (of the number of cans) red beans : white beans : black beans, then work out as a ratio how many cans of beans are needed for 40 people.

- 1) This salad has one can of red beans, twice as many cans of white beans as red beans and three times as many cans of black beans as red beans.
- 2) This salad has one can of red beans, three times as many cans of white beans as red beans and four times as many cans of black beans as red beans.
- 3) This salad has one can of black beans, three times as many cans of white beans as black beans and five times as many cans of red beans as black beans.
- 4) This salad has one can of white beans, two times as many cans of red beans as white beans and three times as many cans of black beans as red beans.
- 5) This salad has two cans of white beans, half as many cans of red beans as white beans and three times as many cans of black beans as red beans.
- 6) This salad has six cans of red beans, half as many cans of white beans as red beans and one third as many cans of black beans as red beans.
- 7) This salad has six cans of white beans, one third as many cans of red beans as white beans and one sixth as many cans of black beans as white beans.
- 8) This salad has seven cans of white beans, four sevenths as many cans of red beans as white beans and three sevenths as many cans of black beans as white beans.
- 9) This salad has three cans of white beans, half as many cans of red beans as black beans and two thirds as many cans of black beans as white beans.

## Exercise 9

Bella has created some more salads. She has written her basic recipe as a ratio (of the number of cans) red beans : white beans : black beans. Write each of Bella's recipes out using the same type of descriptions as Bella has above.

- 1) 1:4:2                      (2) 4:1:5                      (3) 4:5:3  
4) 7:5:1                      (5) 2:6:3

## Exercise 10

Make up five salads of your own and describe them like Bella has. Then write each salad as a ratio (of the number of cans) red beans : white beans : black beans.

## Exercise 11

Trina is another one of Jackie's salad makers. She describes her basic recipe in a different way to the others. Write each of Trina's salads as a ratio (of the number of cans) red beans : white beans : black beans, then work out as a ratio how many cans of beans are needed for 70 people.

Eg: One ninth of the cans in the salad are red beans, two ninths are white beans and the rest are black beans. Answer: Basic recipe 1:2:6 70 people 7:14:42

- 1) One fifth of cans in the salad are red beans, one fifth are white beans and three fifths are black beans.
- 2) One seventh of cans in the salad are red beans, two sevenths are white beans and four sevenths are black beans.
- 3) Two thirteenths of the cans in the salad are white beans, seven thirteenths are black beans and four thirteenths are red beans.
- 4) Two elevenths of the cans in the salad are black beans, seven elevenths are white beans and two elevenths are red beans.
- 5) Three thirteenths of the cans in the salad are white beans, eight thirteenths are black beans and the rest are red beans.
- 6) Two seventh of cans in the salad are red beans, three sevenths are white beans and the rest are black beans.
- 7) Two fifth of cans in the salad are red beans, one fifth are black beans and the rest are white beans.
- 8) One sixth of the cans in the salad are red beans, half are white beans and one third are black beans.
- 9) Three eighths of the cans in the salad are black beans, one quarter are white beans and the rest are red beans.
- 10) Two ninths of the cans in the salad are white beans, four ninths are red beans and one third are black beans.
- 11) One fifth of the cans in the salad are red beans, one third are black beans and the rest are white beans.
- 12) Two thirds of the cans in the salad are black beans, one quarter are white beans and the rest are red beans.

## Exercise 12

Trina has created some more salads. She has written her basic recipe as a ratio (of the number of cans) red beans : white beans : black beans. Write each of Trina's recipes out using the same type of descriptions as Trina has above.

- 1) 7:4:2                      (2) 4:2:5                      (3) 4:5:8
- 4) 3:3:1                      (5) 2:6:3

## Exercise 13

Make up five salads of your own and describe them like Trina has. Then write each salad as a ratio (of the number of cans) red beans : white beans : black beans.

## Exercise 14

Stella and Bella have decided to join their salads to make new salads. Work out the new basic recipe and write it as a ratio (of the number of cans) red beans : white beans : black beans, then work out as a ratio how many cans of beans are needed for 60 people. (Note: the new basic recipe will be for 20 people.)

Stella and Bella's basic recipes are written as ratios below. Red beans : white beans : black beans (number of cans).

- |    |              |             |     |              |             |
|----|--------------|-------------|-----|--------------|-------------|
| 1) | Stella 6:3:4 | Bella 4:2:7 | (2) | Stella 3:2:7 | Bella 4:2:7 |
| 3) | Stella 3:2:5 | Bella 3:3:7 | (4) | Stella 4:7:9 | Bella 1:3:8 |
| 5) | Stella 7:5:8 | Bella 2:2:1 | (6) | Stella 7:5:3 | Bella 3:2:3 |

## Exercise 15

Make up five salads for Stella and five salads for Bella. Join the salads together like you have above to get the new basic recipe for the combined salad. Write combined salad basic recipe as a ratio (of number of cans) red beans : white beans : black beans.

# Ratios with Whole Numbers: Answers

## Exercise 1

Salad Name	Basic recipe 10 people	20 people	50 people	100 people
Italian	1:2:3	2:4:6	5:10:15	10:20:30
German	5:4:1	10:8:2	25:20:5	50:40:10
French	6:5:3	12:10:6	30:25:15	60:50:30
Croatian	3:7:2	6:14:4	15:35:10	30:70:20
Swiss	8:4:7	16:8:14	40:20:35	80:40:70
Spanish	5:3:8	10:6:16	25:15:40	50:30:80
Portugese	5:9:1	10:18:2	25:45:5	50:90:10
Polish	6:1:5	12:2:10	30:5:25	60:10:50
Czech	2:5:6	4:10:12	10:25:30	20:50:60

## Exercise 2

Answers will vary.

## Exercise 3

- 1) 3:2:7    15:10:35    (2) 7:5:8    35:25:40    (3) 3:4:6    15:20:30  
4) 3:2:5    15:10:25    (5) 4:7:9    20:35:45    (6) 6:3:4    30:15:20  
7) 7:5:3    35:25:15

## Exercise 4

Answers will vary.

## Exercise 5

- 1) 1:3:4    3:9:12    (2) 2:3:2    6:9:6    (3) 4:7:4    12:21:12  
4) 5:9:8    15:27:24    (5) 3:7:5    9:21:15    (6) 4:3:2    12:9:6

## Exercise 6

Statements given are an example, accept equivalent statements.

- 1) 1:3:2    In this salad there is one can of red beans for every three cans of white beans and for every two cans of black beans.
- 2) 1:4:5    In this salad there is one can of red beans for every four cans of white beans and for every five cans of black beans.
- 3) 4:2:3    In this salad there are four cans of red beans for every two cans of white beans and for every three cans of black beans.
- 4) 3:5:1    In this salad there are three cans of red beans for every five cans of white beans and for every can of black beans.
- 5) 4:6:3    In this salad there are four cans of red beans for every six cans of white beans and for every three cans of black beans.

## Exercise 7

Answers will vary.

## Exercise 8

- 1) 1:2:3 4:8:12 (2) 1:3:4 4:12:16 (3) 5:3:1 20:12:4  
4) 2:1:6 8:4:24 (5) 1:2:3 4:8:12 (6) 6:3:2 24:12:8  
7) 2:6:1 8:24:4 (8) 4:7:3 16:28:12 (9) 1:3:2 4:12:8

## Exercise 9

Statements given are an example, accept equivalent statements.

- 1) 1:4:2 This salad has one can of red beans, four times as many cans of white beans as red beans and half as many cans of black beans as white beans.
- 2) 4:1:5 This salad has one can of white beans, four times as many cans of red beans as white beans and five times as many cans of black beans as white beans.
- 3) 4:5:3 This salad has five cans of white beans, four fifths as many cans of red beans as white beans and three fifths as many cans of black beans as white beans.
- 4) 7:5:1 This salad has one can of black beans, seven times as many cans of red beans as black beans and five times as many cans of white beans as black beans.
- 5) 2:6:3 This salad has six cans of white beans, one third as many cans of red beans as white beans and half as many cans of black beans as white beans.

## Exercise 10

Answers will vary.

## Exercise 11

- 1) 1:1:3 7:7:21 (2) 1:2:4 7:14:28 (3) 4:2:7 28:14:49  
4) 2:7:2 14:49:14 (5) 3:3:8 21:21:56 (6) 2:3:2 14:21:14  
7) 2:2:1 14:14:7 (8) 1:3:2 7:21:14 (9) 3:2:3 21:14:21  
10) 4:2:3 28:14:21 (11) 3:7:5 21:49:35 (12) 1:3:8 7:21:56

## Exercise 12

Statements given are an example, accept equivalent statements.

- 1) 7:4:2 Seven thirteenths of cans in the salad are red beans, four thirteenths are white beans and two thirteenths are black beans.
- 2) 4:2:5 Four elevenths of cans in the salad are red beans, two elevenths are white beans and five elevenths are black beans.
- 3) 4:5:8 Four seventeenths of cans in the salad are red beans, five seventeenths are white beans and eight seventeenths are black beans.
- 4) 3:3:1 Three sevenths of cans in the salad are red beans, three sevenths are white beans and one seventh are black beans.
- 5) 2:6:3 Two elevenths of the cans in the salad are red beans, six elevenths are white beans and three elevenths are black beans.

## Exercise 13

Answers will vary.

## Exercise 14

- 1) 10:5:11 30:15:33 (2) 7:4:14 21:12:42 (3) 6:5:12 18:15:36  
4) 5:10:17 15:30:51 (5) 9:7:9 27:21:27 (6) 10:7:6 30:21:18

## **Exercise 15**

Answers will vary.