

# RATIO AND PERCENTAGE

## Subject

Mathematics

## Prepared By

[Instructor Name]

## Grade Level

5

## Overview

This lesson plan covers teaching content for;

1. Solving problems on ratio.
2. Expressing a number as a percentage of another number.

## Objectives

Students should be able to;

1. Solve problems on ratio.
2. Express a number as a percentage of another number.
3. Solve word problems and equations to find ratios, proportions and percent.

## Activity Starter/Instruction

1. Expressing one number as a percentage of another involves writing one number as a fraction of the other and multiplying by 100%.
2. For example, to express 3 : 5 as a percentage, we would write 3 : 5 as a fraction and multiply by 100%:
3.  $\frac{3}{5} \times 100\% = 60\%$
4. More generally, to express a number  $n_1$  out of a number  $n_2$  or  $n_1 : n_2$  as a percentage, use the formula below:  $\frac{n_1}{n_2} \times 100\%$

## Guided Practice

### Day 2/ Lesson 2: 15 Mins

1. In a bag of red and green sweets, the ratio of red sweets to green sweets is 3:4. If the bag contains 120 green sweets, how many red sweets are there?
2. Step 1: Assign variables:  
Let  $x$  = red sweets  
Write the items in the ratio as a fraction.  
$$\frac{\text{Red}}{\text{Green}} = \frac{3}{4} = \frac{x}{120}$$
3. Step 2: Solve the equation

## Teacher Guide

### Day 1/ Lesson 1: 15Mins

1. Gabriel and Tina are getting married. They have calculated that they will need 35 bottles of wine for their 70 guests. Suddenly they find out that another 20 guests are planning to attend. How much wine do they need in total?
2. Firstly, you need to work out the ratio of wine to guests they used = 35 wine: 70 guests.
3. Then simplify this so 1 wine: 2 guests (or 0.5 bottle wine per guest).
4. They now have 90 guests attending (70 + the extra 20 = 90) so you need to multiply 90 by 0.5 = 45 bottles of wine in total.
5. Pupils should watch out for the wording in this sort of question, which can sometimes ask for the total required, and sometimes the extra required.

## Materials Required

- White Board
- Marker
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## Additional Resources

- <https://www.cognitivecardiowithmsmm.com/cognitive-proportionsand-goldfish>
- <http://www.ms.uky.edu/algebracubed/lessons/skittle>
- [https://www.analyzemath.com/middle\\_school\\_math](https://www.analyzemath.com/middle_school_math)
- <https://www.math-only-math.com/ratio-into-percent>
- [https://www.mathsteacher.com.au/year8/ch08\\_cons](https://www.mathsteacher.com.au/year8/ch08_cons)
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## Additional Notes

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Cross Multiply

$$3 \times 120 = 4 \times x$$

$$360 = 4x$$

Isolate variable x

$$x = 360/4 = 90$$

4. Answer: There are 90 red sweets.

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### Guided Practice

#### Day 3/ Lesson 3: 20mins

1. To turn a ratio into a percentage, you must choose just one part to compare against the whole.
  2. Give pupils an example of a math class with 30 students, 22 passed the last math test and 8 students did not, using this ratio, pupils could find out the percentage of pupils who passed the test.
  3. Because percentages compare one part against the whole, you can write the percentage of pupils who passed as a fraction, with the number of pupils who passed in the numerator, and the number of pupils in the entire class as the denominator.
  4.  $22 \text{ (students who passed)} / 30 \text{ (students in the entire class)}$ . The key point that makes it a percentage, too, is that you're comparing one part against the whole, instead of comparing one part against another part of the same whole.
  5. Work the division represented by the fraction you just wrote. To continue the example:  $22 \div 30 = 0.7333$  (This is a repeating decimal; teacher will decide which decimal point to round to.)
  6. Multiply the result of the division by 100 to convert it into a percentage.  $0.7333 \times 100 = 73.33 \text{ percent}$
  7. So of the entire class, 73.33 percent passed the last test.
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<b>Summary</b> 1. Pick pupils randomly to answer question. 2. Go over the activities with pupils.	<b>Assessment Activity</b> Assess if pupils can: 1. Solve problems on ratio. 2. Express a number as a percentage of another number correctly.	<b>Assessment Activity</b> Pupils need to be familiar with expressing a ratio as a percentage.