Australian Curriculum Year 7 Mathematics Sample assessment | Model response

Refreshing drinks

© The State of Queensland (Queensland Studies Authority) and its licensors 2014. All web links correct at time of publication.

|  |
| --- |
| *Description: Yr7_Maths_DeliciousDrinks_PunchBowl* |
| Image: © The State of Queensland (Queensland Studies Authority) 2014 |

|  |
| --- |
| Students apply understanding of ratios, fractions and percentages to solve problems when mixing ingredients for fruity drinks. |
| **You will:*** express the quantities of ingredients in mixed fruity drinks as ratios, fractions and percentages
* solve problems involving mixing and adjusting the ratios of ingredients.
 |

|  |
| --- |
| **This model response gives one example of a very high quality response for each question.** |

## Section 1. Mei’s orange concentrate

A new brand of fruit juice concentrate called **Mei’s orange concentrate** is available at your local shop.

This type of fruit juice drink comes in a concentrated form. You need to mix water with it before it is ready to drink.

1. A glass contained the ratio shown below:

|  |  |  |
| --- | --- | --- |
|  |  | The ratio of concentrate to water is:............. 4:8 or 1:2 ...................... |
| water |
| concentrate |

1. The instructions on the bottle say to mix it in the ratio 1:7 (1 part concentrate to 7 parts water).
Draw a picture to illustrate this ratio.

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. You decide to try an overly concentrated drink and use 3 parts fruit juice concentrate. It’s too strong and you decide mix it in the ratio 1:7 according to the instructions on the bottle.
	1. How many parts of water should you add to the 3 parts fruit juice concentrate?

....... 21

* 1. Draw a picture to show the quantities of fruit juice concentrate and water used.

|  |  |  |
| --- | --- | --- |
|  |  |  |

* 1. Write this as a ratio. 3: 21
	2. Write this ratio as a fraction. .............$ \frac{3}{21}$
	3. Write an equivalent fraction in its simplest form. ...........$ \frac{1}{7}$
1. When the fruit juice concentrate is mixed with water in the ratio 1:7 …
	1. What fraction of the mixture is concentrate?
	Show your working.

|  |  |
| --- | --- |
| Total number of parts in mixture Fraction that is concentrate  | = 1 + 7= 8= $\frac{1}{8}$ |

* 1. What percentage (%) of the mixture is concentrate?
	Show your working.

|  |  |
| --- | --- |
| % that is concentrate  | = $\frac{1}{8}$ x 100%= 12.5% |

* 1. What fraction of the mixture is water?
	Show your working.

|  |  |
| --- | --- |
| Total number of parts in mixture Fraction that is water | = 8=$ \frac{7}{8}$ |

* 1. What percentage (%) of the mixture is water?
	Show working.

|  |  |
| --- | --- |
| % that is water  | = $\frac{7}{8}$ x 100 %= 87.5 % |

1. You like to keep some mixed drink in the fridge.
	1. To make a mixture using 400 mL of concentrate, how much water would you add?
	Show your working, using answer/s from Question 4.

|  |
| --- |
| $\frac{1}{8}$ of the mixture is concentrate, $\frac{7}{8}$ is water. There is 7 times as much water as concentrateAmount of water = 7 x 400 mL = 2800 mL  |

* 1. How much mixed drink would this make?
	Show your working.

|  |
| --- |
| Total amount = 400 mL + 2800 mL = 3200 mL = 3.2 L |

1. You need to mix 5.6 litres of mixed drink to take to sports training.
	1. How much concentrate and water do you need?
	Show your working.

|  |
| --- |
| 5.6 L = 5600 mLAmount of concentrate = $\frac{7}{8}$ of 5600 mL = 7 x 5600 / 8 = 4900 mL or 4.9 LAmount of water = $\frac{1}{8}$ of 5600 mL = 700 mL |

1. One day you wrongly mix up some drink by adding 500 mL of concentrate to 1500 mL of water.
	1. What is the ratio of concentrate to water? (Express this ratio in its simplest form)

500:1500 = 1:3

* 1. Does the drink contain too much concentrate or too much water? Explain how you know.

In the correct mixture, there is 7 times as much water as concentrate, but in this mixture there is only 3 times as much water as concentrate. More water needs to be added as there is too much concentrate.

* 1. How would you adjust the mixture so it is mixed correctly?
	Show your working.

|  |
| --- |
| For 500 mL of concentrate,The total amount of water needed = 7 x 500 mL = 3500 mLI have only added 1500 mL of water,so the extra amount I need to add = 3500 – 1500 mL = 2000 mL or 2.0 L |

## Section 2. Paradise punch

You volunteer to make up a fruit punch for a party.

|  |  |
| --- | --- |
| Yr7_Maths_DeliciousDrinks_PunchBowl | Paradise punch |
| Mix lemonade, ginger ale and fruit juice in the ratio 2:1:3. |

1. You decide to test your recipe by making a small amount in a glass, and then plan to make up a large bowl of fruit punch to take to the party.
	1. If you add 80 mL of lemonade to a glass, how much ginger ale and fruit juice would you have to you add?

|  |
| --- |
| Lemonade : ginger ale : fruit juice = 2:1:3For 80 mL of lemonade, the ratio is 80:40 :120So I need 40 mL of ginger ale and 120 mL of fruit juice. |

* 1. How much Paradise punch does this make?

|  |
| --- |
| Amount of punch = 80 + 40 + 120 mL = 240 mL |

* 1. Express the ratio of each ingredient as a percentage of the whole.

|  |  |
| --- | --- |
| % lemonade % ginger ale % fruit juice | = $\frac{80}{240}$ x 100 = 33.3%= $\frac{40}{240}$ x 100 = 16.7%= $\frac{120}{240}$ x 100 = 50% |

1. When you arrive at the party, you have left your measuring jug at home so you have to measure the ingredients using a cup.

You put one cup of lemonade in the punch and then add the other ingredients.

* 1. How many cups of the other ingredients would you add?

|  |
| --- |
| Lemonade : ginger ale : fruit juice = 2:1:3For 1 cup of lemonade, the ratio is 1:$ \frac{1}{2}$: 1$\frac{1}{2}$So I need $\frac{1}{2}$cup of ginger ale and 1$\frac{1}{2} $cups of fruit juice |

* 1. How many cups of punch does this make? Show your working.

|  |
| --- |
| Number of cups = 1 + $\frac{1}{2}$+ 1$\frac{1}{2}$ = 3 cups |

You want to make up enough punch so everyone can have 4 cups each. There are 12 people at the party.

1. How many cups of each ingredient would you use? Show your working

|  |
| --- |
| Punch needed = 4 x 12 = 48 cupsLemonade : dry ginger ale : fruit juice = 2:1:3 Total parts = 2 + 1 + 3 = 6 partsFor 48 cupsEach part = 48 ÷ 6 = 8 cupsIngredients needed to make 48 cups:Lemonade = 2 x 8 = 16 cupsDry ginger ale = 1 x 8 = 8 cupsFruit juice = 3 x 8 = 24 cups |