Unit 1 Lesson 5: Ratio Tables and Double Line Graphs

Objectives

* Students solve problems by comparing different ratios using two or more ratio tables.
* Students create equivalent ratios using a ratio table and represent these ratios on a double number line diagram.
* Students extend and use a double number line diagram to solve ratio problems related to the real world.

Unit 1 Lesson 5: Ratio Tables and Double Line Graphs Notes

Create four equivalent ratios (2 by scaling up and 2 by scaling down) using the ratio 30 to 80.

Write a ratio to describe the relationship shown in the table.

|  |  |
| --- | --- |
| **Hours** | **Number of Pizzas Sold** |
| 2 | 16 |
| 5 | 40 |
| 6 | 48 |
| 10 | 80 |

The following tables show how many words each person can text in a given amount of time. Compare the rates of texting for each person using the ratio table.

Michaela

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes | 3 | 5 | 7 | 9 |
| Words | 150 | 250 | 350 | 450 |

Jenna

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes | 2 | 4 | 6 | 8 |
| Words | 90 | 180 | 270 | 360 |

Maria

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes | 3 | 6 | 9 | 12 |
| Words | 120 | 240 | 360 | 480 |

Complete the table so that it shows Max has a texting rate of 55 words per minute.

Max

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes |  |  |  |  |
| Words |  |  |  |  |

The tables below show the comparison of the amount of water to the amount of juice concentrate (JC) in grape juice made by three different people. Whose juice has the greatest water-to-juice concentrate ratio, and whose juice would taste strongest? Be sure to justify your answer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Laredo’s Juice** |  | **Franca’s Juice** |  | **Milton’s Juice** |
| Water | JC | Total |  | Water | JC | Total |  | Water | JC | Total |
| 12 | 4 | 16 |  | 10 | 2 | 12 |  | 8 | 2 | 10 |
| 15 | 5 | 20 |  | 15 | 3 | 18 |  | 16 | 4 | 20 |
| 21 | 7 | 28 |  | 25 | 5 | 30 |  | 24 | 6 | 30 |
| 45 | 15 | 60 |  | 40 | 8 | 48 |  | 40 | 10 | 50 |

Put the juices in order from the juice containing the most water to the juice containing the least water.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain how you used the values in the table to determine the order.

What ratio was used to create each table?

Laredo \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Franca \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Milton \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The next day, each of the three people made juice again, but this time they were making apple juice. Whose juice has the greatest water-to-juice concentrate ratio, and whose juice would taste the strongest? Be sure to justify your answer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Laredo’s Juice** |  | **Franca’s Juice** |  | **Milton’s Juice** |
| Water | JC | Total |  | Water | JC | Total |  | Water | JC | Total |
| 12 | 2 | 14 |  | 15 | 6 | 21 |  | 16 | 6 | 22 |
| 18 | 3 | 21 |  | 20 | 8 | 28 |  | 24 | 9 | 33 |
| 30 | 5 | 35 |  | 35 | 14 | 49 |  | 40 | 15 | 55 |
| 42 | 7 | 49 |  | 50 | 20 | 70 |  | 64 | 24 | 88 |

Put the juices in order from the strongest apple taste to the weakest apple taste.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What ratio was used to create each table?

Laredo \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Franca \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Milton \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How was this problem different than the grape juice questions?

Max and Sheila are making orange juice. Max has mixed 15 cups of water with 4 cups of juice concentrate. Sheila has made her juice by mixing 8 cups water with 3 cups of juice concentrate. Compare the ratios of juice concentrate to water using ratio tables. State which beverage has a higher juice concentrate-to-water ratio.

Victor is making recipes for smoothies. His first recipe calls for 2 cups of strawberries and 7 cups of other ingredients. His second recipe says that 3 cups of strawberries are combined with 9 cups of other ingredients. Which smoothie recipe has more strawberries compared to other ingredients? Use ratio tables to justify your answer.

The amount of sugary beverages Americans consume is a leading health concern. For a given brand of cola, a 12-ounce serving of cola contains about 40 grams of sugar. Complete the ratio table, using the given ratio to find equivalent ratios.

|  |  |  |  |
| --- | --- | --- | --- |
| Cola (ounces) |  | 12 |  |
| Sugar (grams) |  | 40 |  |

A 1-liter bottle of cola contains approximately 34 fluid ounces. How many grams of sugar would be in a 1-liter bottle of the cola? Explain and show how to arrive at the solution.

A school cafeteria has a restriction on the amount of sugary drinks available to students. Drinks may not have more than 25 grams of sugar. Based on this restriction, what is the largest size cola (in ounces) the cafeteria can offer to students?

Shontelle solves three math problems in four minutes.

* 1. Use this information to complete the table below.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of Questions | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| Number of Minutes |  |  |  |  |  |  |  |  |  |  |

Shontelle has soccer practice on Thursday evening. She has a half hour before practice to work on her math homework and to talk to her friends. She has 20 math skill-work questions for homework, and she wants to complete them before talking with her friends. How many minutes will Shontelle have left after completing her math homework to talk to her friends?

Use a double number line diagram to support your answer, and show all work.

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Classwork/ Partner Practice

1. Sarah and Eva were swimming. Use the ratio tables below to determine who the faster swimmer is.

Sarah

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time (min) | 3 | 5 | 12 | 17 |
| Distance (meters) | 75 | 125 | 300 | 425 |

Eva

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time (min) | 2 | 7 | 10 | 20 |
| Distance (meters) | 52 | 182 | 260 | 520 |

Explain the method that you used to determine your answer.

1. A 120 lb. person would weigh about 20 lb. on the moon. A 150 lb. person would weigh 28 lb. on Io, a moon of Jupiter. Use ratio tables to determine which moon would make a person weigh the most.
2. While shopping, Kyla found a dress that she would really like, but it costs $52.25 more than she has. Kyla charges $5.50 an hour for babysitting. She wants to figure out how many hours she must babysit to earn $52.25 to buy the dress. Use a double number line to support your answer.
3. Frank has been driving at a constant speed for 3 hours, during which time he traveled 195 miles. Frank would like to know how long it will take him to complete the remaining 455 miles, assuming he maintains the same constant speed. Help Frank determine how long the remainder of the trip will take. Include a table or diagram to support your answer.

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Exit Ticket/HW

Beekeepers sometimes supplement the diet of honey bees with sugar water to help promote colony growth in the spring and help the bees survive through fall and winter months. The tables below show the amount of water and the amount of sugar used in the Spring and in the Fall.

|  |
| --- |
| Fall Sugar Water Mixture |
| Sugar (cups) | Water (cups) |
| 4 | 2 |
| 10 | 5 |
| 14 | 7 |
| 30 | 15 |

|  |
| --- |
| Spring Sugar Water Mixture |
| Sugar (cups) | Water (cups) |
| 6 | 4 |
| 15 | 10 |
| 18 | 12 |
| 27 | 18 |

Write a sentence that compares the ratios of the number of cups of sugar to the number of cups of water in each table.

Explain how you determined your answer.

Kyra is participating in a fundraiser Walk-a-Thon. She walks 2 miles in 30 minutes. If she continues to walk at the same rate, determine how many minutes it will take her to walk 7 miles. Use a double number line diagram to support your answer.