



Earn a special TREAT! Select three activities from the Tic-Tac-Toe chart below. Complete the activities and turn in to your Math teacher on the first day of school, Tuesday, August 10, 2021.

Unit 1 Ratios and Rates

Tic-Tac-Toe

Body Ratios

Measure your height, wingspan, foot and forearm to find ratios.



1.1

Height Conversions

Find the height in feet of ten objects. Convert the measurements to inches, yards and miles.



1.5

Metric Lengths

List countries that use metric and customary measurement. Convert landmarks in meters to *mm*, *cm* and *km*.



1.5

Student Survey

Survey students about something they like and determine ratios.



1.1

Gas Mileage

Find the gas mileage of your family car and compare to the manufacturer's claim.



1.3

Typing

Time yourself typing to find your rate of words typed per minute.



1.4

Food Dilemma

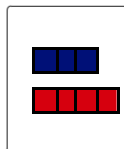
Take a trip to the grocery store. Find the best deal on specific items.



1.4

Tape Diagram Guide

Create a "How-To" guide for using tape diagrams to solve ratio problems.



1.1

A Ratio Table Menagerie

Use zoo survey information to determine how much it will cost a new zoo to care for their animals.



1.2

Tic-Tac-Toe: Body Rates

There are some interesting ratios related to bodies. Choose whether to measure the lengths below using customary units or metric units. If you choose customary units, measure each length to the nearest inch. If you choose metric units, measure each length to the nearest centimeter.



Measure and record your height. Measure from the floor to the top of your head (without shoes).

Measure and record your wingspan. Extend your arms at a 90° angle from your body. Measure the length across your back from one fingertip to the other fingertip.

Measure and record the length of your foot from the back of your heel to the tip of your longest toe.

Measure and record the length of your forearm from the inner crease of your elbow along the inside of your arm to your wrist.

Step 1: Find the ratio of your height to your wingspan.

Step 2: Find the ratio of your foot to your forearm.

Step 3: Find the ratio of height to wingspan and the ratio of foot to forearm for four additional people. Record the measurements and ratios of your own measurements and four other people in a chart.

Step 4: Look at each group of ratios. Are the ratios similar to each other for $\frac{\text{wingspan}}{\text{height}}$? Are the ratios similar to each other for $\frac{\text{foot}}{\text{forearm}}$? Explain whether the ratios are closest to $1 : 1$, $1 : 2$, $2 : 1$ or something else.

Step 5: Find two different lengths on your body to measure that would give you a ratio close to $1 : 2$. Show the measurements and corresponding ratios in your explanation.

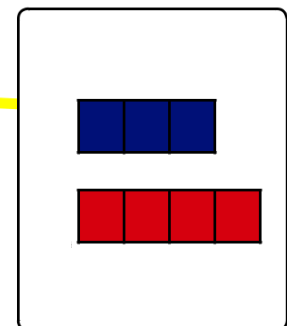
Tic-Tac-Toe:

Tape Diagram Guide

Tape diagrams can be helpful in solving problems involving ratios. Create a “How To” guide for using tape diagrams to solve two different types of ratio problems.

- 1) An unknown part given a ratio and the total (i.e., **Lesson 1.1 Example 2**).
- 2) An unknown total given the ratio and a part. At the end of your “How To” guide, create four problems for the user of the guide to solve using tape diagrams.

Include an answer key on the back of the guide.



Tic-Tac-Toe: Student Survey



Determine a question you would like to ask 40 people. You could ask people their favorite movie type, music type, food type or any other preference of your choosing. Write this question on your paper.

You will need three, four or five different possible answers to the question you chose.

Example: Ask students, “Which type of ice cream is your favorite ~ chocolate, vanilla, strawberry, cookies and cream or fudge swirl?”

Record the responses to your question in a chart like the one below.

Types of _____					
Frequency (number of students who chose each type)					

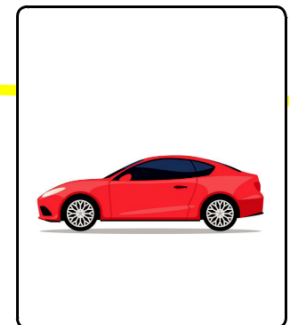
Step 1: For each preference find:

the ratio of students who preferred that choice to those who did not prefer that choice.

the ratio of students who preferred that choice to all students surveyed.

Step 2: Clearly organize and display your question as well as your table with responses and ratios.

Tic-Tac-Toe: Gas Mileage



The gas mileage a car gets is the ratio of the miles a car has driven to the number of gallons of gas used.

$$\text{Gas Mileage} = \frac{\text{miles driven}}{\text{gallons of gas used}}$$

Example: A car traveled 235 miles using 12 gallons of gas. Its gas mileage is $\frac{235 \text{ miles}}{12 \text{ gallons}}$. The rate for gas mileage is usually written as a decimal rounded to the nearest tenth.

12 gallons

In this case, $\frac{235 \text{ miles}}{12 \text{ gallons}} = 19.583 \approx 19.6$ miles per gallon.

Step 1: Record the gas mileage of your family car. Do this by writing down the number of miles driven since the last fill-up and the amount of gas needed to fill up the tank at the gas station.

Step 2: Record the gas mileage of your family car one more time to compare the two rates.

Step 3: What is the estimated gas mileage for your family car based on your data?

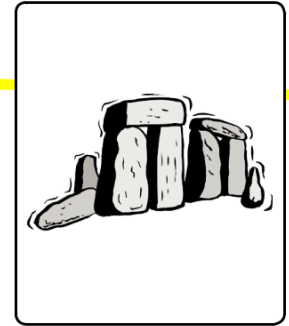
Step 4: Research your car to find out what the manufacturer says the gas mileage should be.

Step 5: Research to find which cars have the best gas mileage (most miles per gallon).

Create a list of the top five cars.

Tic-Tac-Toe: Metric Lengths

Signs along freeways in the United States tell you the number of miles until the next exit or city. Mountains and waterfalls are measured in feet. People talk about how many inches children have grown. These are customary measurements. People in most countries around the world see signs indicating kilometers, measure mountains and waterfalls using meters and discuss the growth of children in terms of centimeters.



Step 1: Research to find the countries that use customary measurement and the countries that use metric measurement. List 3 countries that use customary measurement. List ten countries that use metric measurement.

Step 2: Find the height, in meters, of one landmark in five different countries that use the metric system of measurement found in **Step 1**. Record each measurement in meters. Convert each measurement to millimeters, centimeters and kilometers. Round all measurements to the nearest tenth. Copy and complete the table below with each of your five landmarks. Include the name of the landmark as well as the country where it is located.

Name of Landmark						
Height (m)						
Height (mm)						
Height (cm)						
Height (km)						

Tic-Tac-Toe: Height Conversions

Find the height of ten different landmarks in the United States not already given in this textbook.

Example: Find the height of Mt. Whitney in California, the height of Olo'upeua Falls in Hawaii, the depth of the Grand Canyon or the depth of Lake Michigan.

Record each measurement in feet. Convert each measurement to inches, yards and miles. Round each answer to the nearest tenth, if necessary. Copy and complete the table below with each of your ten landmarks. The last column is for your own height.



Name of Landmark											You
Height (ft)											
Height (in)											
Height (yd)											
Height (mi)											

Tic-Tac-Toe: Food Dilemma



Grocery stores often sell the same type of cereal in different-sized boxes. For example, there may be one price for a 14-ounce box and another price for a 20-ounce box of the same brand. Which one is the best deal?

Take a trip to a grocery store and find the items listed in the chart. Remember you **DO NOT** have to buy the items, just find the prices.

Step 1: Copy the following table and take it to a local grocery store.

Step 2: Record the brand name of the item you have selected for cereal, cheese and peanut butter.

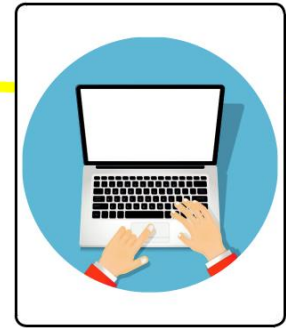
Step 3: Record the size of the item and its price. If it is on sale, put a * next to the price.

Step 4: Find the unit price for each item (the price per ounce or price per pound).

Step 5: Determine which size item is the best deal (cheapest price per ounce or pound).

	Size	Price	Unit Price	Best Deal?
Cereal Brand: _____	1.	1.	1.	
	2.	2.	2.	
	3.	3.	3.	
Cheese Brand: _____	1.	1.	1.	
	2.	2.	2.	
	3.	3.	3.	
Peanut Butter Brand: _____	1.	1.	1.	
	2.	2.	2.	
	3.	3.	3.	

Tic-Tac-Toe: Typing



How many words per minute can you type? Use a timer or ask a friend to time you as you type the following story.

Sally went to the store with her mother and brother and bought some milk, carrots, onions, salad dressing and tomatoes. Next, Sally's mom took her to the dentist and the dry cleaners. Sally wanted to go home and play with her friends. Finally, Sally's mom was done with errands for the day. She took Sally to the park to play with her friends. Sally's friend, Tom, asked her what she had done that day. She told Tom she went to the store, the dentist and the dry cleaners. Tom reminded her that they had soccer practice in the evening. Sally told him she would see him at practice. She left for home to get ready.

Step 1: Type the entire 115 word paragraph and time yourself. Record the number of seconds it took you to type the passage. Also record the number of errors you made. Keep typing the passage until you make fewer than 5 errors. If this happens on your first try, type faster and see how many errors you make. Type the passage and record the information at least three times.

Attempts	Time (sec)	Number of Errors
1		
2		
3		

Step 2: What was your fastest typing rate as a unit rate of words per minute?

Step 3: What was your fastest typing rate with fewer than 5 errors?

Step 4: How long would it take you to type a 1-page paper with 460 words at your fastest rate?

A Ratio Table Menagerie

A collection of zoos around the United States were surveyed about the number of a few types of animal they had at their zoos and created a table showing the simplified ratios of the different types of animals in the first column.



Monkeys	5	10		
Snakes	3			21
Birds	9			
Lions	2		8	
Elephants	4			
Bears	1			

Step 1: Copy and complete the ratio table above.

Step 2: In the survey, the zoos that participated had a total of 52 elephants. How many bears do these zoos have altogether?

Step 3: Determine the total number of birds owned by these zoos. If each bird eats 0.25 pounds of bird food on average each day, how many pounds of food will all of the birds at these zoos eat in the month of March?

Step 4: The zoos have determined that each monkey needs approximate 75 square feet of ground to not be too crowded in their cages. What is the total number of square feet in all of the zoos combined that should be dedicated to monkey exhibits?

Step 5: A new zoo wants to follow the ratio of animals that this survey determined. They want to have 6 lions at their zoo. If it costs on average \$80 per day to take care of each animal at the zoo, how much will it cost daily, for this zoo to take care of their monkeys, snakes, birds, lions, elephants and bears?



Unit 1 Ratios and Rates Tic-Tac-Toe Answer Key

Tic-Tac-Toe:

A Ratio Table Menagerie

Step 1:

Monkeys	5	10	20	35
Snakes	3	6	12	21
Birds	9	18	36	63
Lions	2	4	8	14
Elephants	4	8	16	28
Bears	1	2	4	7

Step 2: 13 bears

Step 3: 117 total birds

29.25 lbs of food per day

906.75 lbs of food in March

Step 4: 4,875 square feet

Step 5: \$5,760 per day