Table of Contents

Introduction

Who is running faster? Which shape has a larger area? Which sale is a better deal? Which country has a greater population density? Which food item has more fat calories? Who earns more dollars per hour? Which fraction is larger? Which product has a smaller unit price? Which object has a greater density? Which outcome is more likely? Which competitive eater consumes more calories per minute? Comparisons provide a motivating backdrop to perform mathematical calculations in a wide range of contexts.

This collection of 150 problems asks students in Grades 6 and 7 to perform calculations to make a comparison and come to a decision. The *Dare to Compare Math* format recasts more traditional math problems from a single calculation to two or more calculations to come to a final conclusion. Rather than compute the unit price of a single food item, the student computes the unit price of two food items to determine which item is a better deal. Instead of calculating the probability of a single event, the student calculates the probability of two events to determine which is more likely.

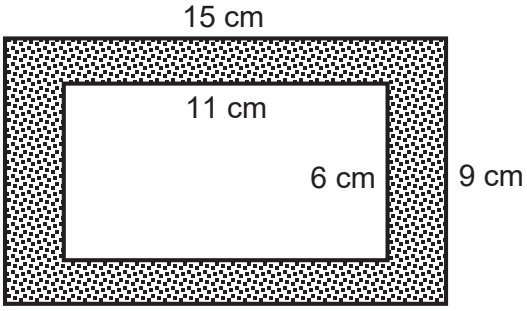
The problems are intended to be non-routine but accessible. The solution process is open-ended, allowing students to create mathematical reasoning and to decide how to quantify in order to formulate a conclusion. The one guiding rule for all problems is that the conclusions are to be supported with calculations and concrete answers. To determine who charges less for a dozen donuts in question 1, calculate what Daisy and Freda each charge for a dozen donuts. To decide whether the shaded area or unshaded area is larger in question 2, compute the areas of the shaded and unshaded regions. To conclude who is running faster in question 3, calculate Tyler's speed and Johnny's speed.

Comparisons are especially suited for problems involving rates, ratios, fractions, percentages, and proportions. However, they can serve as a backdrop for any mathematical topic–2D and 3D geometry, graphing, algebraic reasoning, patterns, probability, statistics, counting, measurement, number operations, and logic. So the comparisons are rich in both mathematical content and critical thinking. Each problem is accompanied by one or more hints and a complete solution (many problems have multiple solution methods, and we make no claim to provide the best method). Use of calculators is generally not needed, but is allowed for a small selection of problems accompanied by a calculator symbol  . For some questions, the compared quantities are equal rather than one being greater than the other.

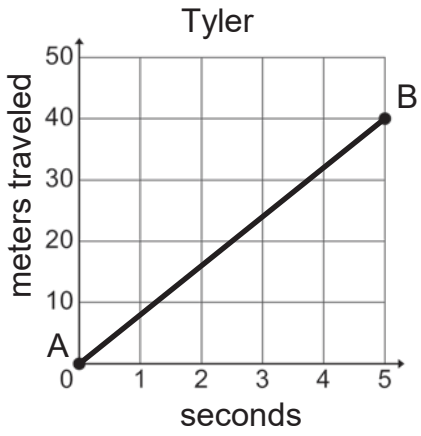
1. Who charges less for a dozen donuts?

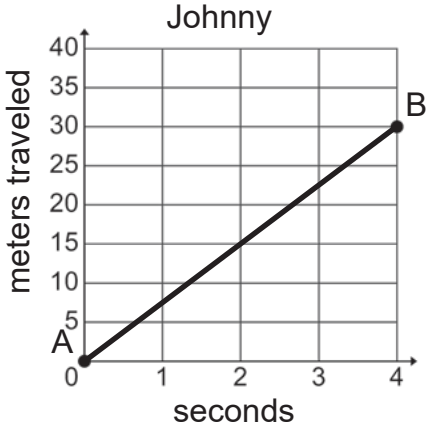
Daisy's Donuts	Freda's Donuts
• 60¢ per donut • $2 off if you buy a dozen	• 50¢ per donut • 20% off if you buy a dozen

2. Which is larger: the shaded area or the unshaded area?

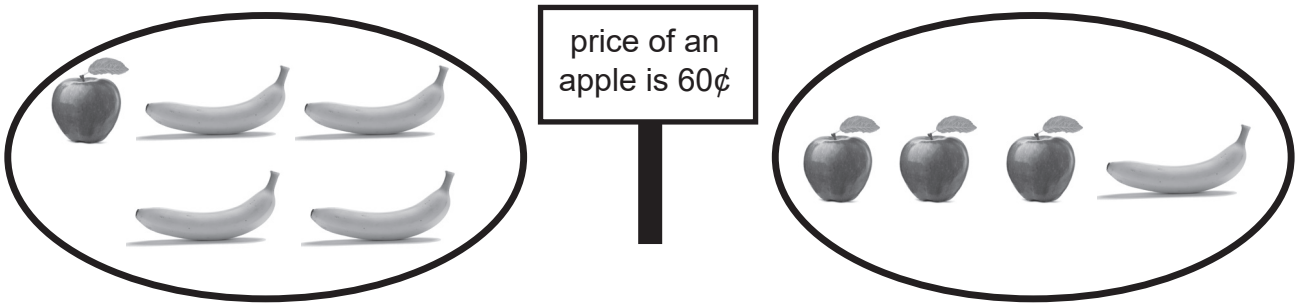


3. Who runs at a faster speed from A to B?





40. What must be the price of a banana for the left fruit plate to have the same cost as the right fruit plate? (Each banana has the same price.)



41. Which costs less: 1 fluid ounce of gasoline or 1 fluid ounce of bottled water?

$2.56 for
1 gallon
of gasoline

$1.44 for 1 bottle
of water containing
24 fluid ounces

1 gallon = 128 fluid ounces

42. Who travels at a faster speed?

coyote

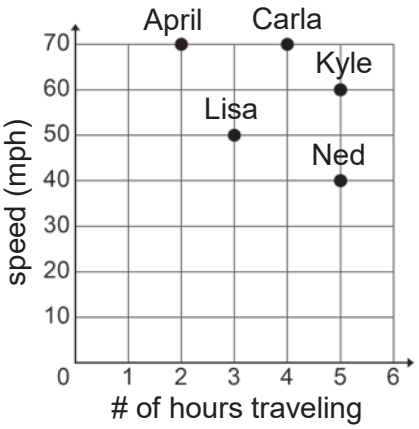
10 meters/second

cyclist

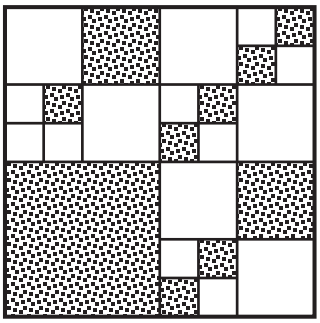
35 kilometers/hour

1 kilometer = 1,000 meters
1 hour = 60 minutes
1 minute = 60 seconds

94. Who travels the greatest number of miles? Who travels the least number of miles?



95. Which represents a larger fraction of the square: the shaded area or the unshaded area?



96. If a $50 jacket has its price reduced to $40, this is a 20% discount since the $10 price reduction is 20% off the original $50 price. Which price reduction is the largest percentage off the original price? Which is the smallest percentage off the original price?