# Math 8 Proportional Reasoning Project

*Ratios and Rates*

## General Curriculum Outcomes

Students will be expected to demonstrate number sense.

## Specific Curriculum Outcomes

**N04:** Students will be expected to demonstrate an understanding of ratio and rate.
***N05****:* Students will be expected to solve problems that involve rates, ratios, and proportional reasoning.

## Summary

In this project students will use their knowledge of ratios, rates, and unit rates to plan a road trip across Canada. In the first part students will choose three destinations and determine gas mileage and fuel costs. In the second part students will calculate accommodation costs and food costs. In the third part students will answer questions about their trip.

## Time

This project will take two 60 minute class periods.

# Road Trip Project

Name:_____

In this project you will plan a three week road trip across Canada. You will determine how much the trip will cost you, as well as answer questions about your road trip. **Show your work for all calculations.**

## Part 1: Where are you going?

*Step 1: From the list below, choose the three cities that you want to visit during your road trip. Choose your starting point.*

Edmonton, Alberta
Victoria, British Columbia
Winnipeg, Manitoba
Fredericton, New Brunswick
Yellowknife, Northwest Territories
Halifax, Nova Scotia
Toronto, Ontario
Montreal, Quebec

**Starting Point: _____**

**Destination 1: _____**

**Destination 2: _____**

**Destination 3: _____**

*Step 2: Determine the total distance of your trip using the information below. Record this information on the next page.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Edmonton to:** | Victoria 1,249 km | Winnipeg 1304 km | Fredericton 4,383 km | Yellowknife 1,452 km | Halifax 4,810 km | Toronto 3,475 km | Montreal 3,580 km |
| **Victoria to:** | Edmonton 1,249 | Winnipeg 2,383 km | Fredericton 5,378 km | Yellowknife 2,366 km | Halifax 6,171 km | Toronto 4,393 km | Montreal 4,571 km |
| **Winnipeg to:** | Victoria 2,410 km | Edmonton 1312 km | Fredericton 3,069 km | Yellowknife 2,734 km | Halifax 3,496 km | Toronto 2,235 km | Montreal 2,266 km |
| **Fredericton to:** | Victoria 5,378 km | Winnipeg 3,067 km | Edmonton 4,383 km | Yellowknife 5,804 km | Halifax 435 km | Toronto 1,365 km | Montreal 814 km |
| **Yellowknife to:** | Victoria 2,366 km | Winnipeg 2,729 km | Fredericton 5,808 km | Edmonton 1,452 km | Halifax 6,234 km | Toronto 4,900 km | Montreal 5,004 km |
| **Halifax to:** | Victoria 6,171 km | Winnipeg 3,496 km | Fredericton 435 km | Yellowknife 6,232 km | Edmonton 4,810 km | Toronto 1,794 km | Montreal 1,242 km |
| **Toronto to:** | Victoria 4,393 km | Winnipeg 2,235 km | Fredericton 1,365 km | Yellowknife 4,900 km | Halifax 1,794 km | Edmonton 3,475 km | Montreal 550 km |
| **Montreal to:** | Victoria 4,571 km | Winnipeg 2,266 km | Fredericton 814 km | Yellowknife 5,004 km | Halifax 1,242 km | Toronto 550 km | Edmonton 3,580 km |

| **Starting Point** | **Destination 1** | **Distance Between Cities** |
|---|---|---|
| **Destination 1** | **Destination 2** | **Distance Between Cities** |
| **Destination 2** | **Destination 3** | **Distance Between Cities** |
| **Destination 3** | **Starting Point** | **Distance Between Cities** |

**Total Distance: _____**

*Step 3: You own two vehicles and have to decide which one you are going to take.*

| | **Option 1** | **Option 2** |
|---|---|---|
| | Hyundai Elantra | Ford Escape |
| Fuel required to drive 100 km | 9.1 litres | 11.4 litres |

a) Determine the gas mileage in L/km for each option (unit rate). Which option is more fuel efficient?

Option 1: _____ Show your work here.

Option 2: _____

b) The cost of fuel is $62 for 50 litres. What is the price per litre?

c) Determine the cost to drive 100 km for each option.

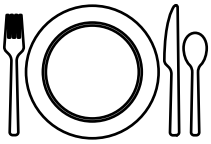
Option 1: _____ Show your work here.

Option 2: _____

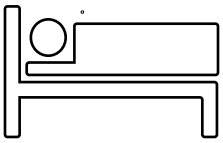
d) Which option are you going to go with? Explain why.

e) Calculate how many litres of gas you will need for the total distance of your trip. Show your work.

f) How much will fuel cost for this total distance? Show your work.



## Part 2: Food and Accommodations



*Step 1: Determine how much it will cost you to stay in hotels. You will need a hotel for 20 nights.*

| Hotel Rating | Cost per Night |
|---|---|
| 1 Star | $38 |
| 2 Stars | $49 |
| 3 Stars | $67 |
| 4 Stars | $190 |
| 5 Stars | $270 |

a) Decide how many nights you will stay at each type of hotel (based on rating) and determine the total cost of meals for the trip.

Example: 1 Star x 4 nights = $38 x 4 = $152

1 Star x _____ night(s) = $_____

2 Stars x _____ night(s) = $_____

3 Stars x _____ night(s) = $_____

4 Stars x _____ night(s) = $_____

5 Stars x _____ night(s) = $_____

**Total hotel cost: $_____**

b) At one of the hotels you go to the ratio of floral curtains to solid coloured curtains is 2:3. If there are 94 solid coloured curtains, how many floral curtains are there?

*Step 2: Determine how much it will cost you to pay for food for the trip.*

a) Plan for 3 meals a day, for the three weeks (21 days). Choose how many meals you will eat at each type of restaurant, and determine the total cost at each type of restaurant you will spend.

| Type of Restaurant | Cost per meal |
|---|---|
| Cafe | $12 |
| Fast Food | $8 |
| Diner | $10 |
| Fancy Restaurant | $25 |

Example: Diner x 8 meals = $10 x 8 = $80.

Cafe x _____ meal(s) = $_____

Fast Food x _____ meal(s) = $_____

Diner x _____ meal(s) = $_____

Fancy Restaurant x _____ meal(s) = $_____

**Total meal cost: $_____**

b) One of your meals during the trip is a salad. In this salad the ratio of cucumber slices to cherry tomatoes is 8:3. If there are 24 cucumber slices in your salad, how many cherry tomatoes are there?

c) At one of the restaurants you order two lemonades. The first lemonade was made with 1 cup of concentrate and 2 cups of water. The second lemonade was made with 5 cups of concentrate and 7 cups of water. Which lemonade was stronger?

## Part 3: About the Trip

*Step 1: During your trip you decide to go for a walk to go sight-seeing. Answer the following questions about your walk.*

a) While on the walk you come across a field where there are a lot of birds flying around. You see 3 seagulls, 10 crows, and 2 eagles.

i) What is the ratio of seagulls to crows?

ii) What is the ratio of crows to all birds?

iii) What is the ratio of eagles to seagulls to crows?

b) While on the walk you also pass by two different tour groups. In the first tour group there are 12 boys and 15 girls. In the second tour group there are 9 boys and 11 girls. In which tour group did you see a greater ratio of boys to girls?

*Step 2: One day during your trip you come across a grocery store that is offering cooking classes. You decide to take a class and learn how to bake a chocolate cake.*

a) The cake recipe that you are following for the class calls for 3 cups of flour for every 2 cups of sugar. The instructor of the class tells you that you only have 2 cups of flour to use. How much sugar will you need to you?

b) The ratio of teaspoons of vanilla to teaspoons of baking soda is 1:2. Write the ratio of teaspoons of vanilla to teaspoons of baking soda if the recipe was tripled.

*Step 3: During the trip you go to see a musical performance. The cost of one adult ticket is $14 and a student ticket costs $11.*

a) After the show you talk to someone in the musical and find out that the show was sold out! 190 tickets were sold to students, with a ratio of adult tickets sold to student tickets sold of 2:4. How many adult tickets were sold?

b) How much many did the performance make?

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*Final Step: Add the cost of the fuel, hotels, and meals:*

**TOTAL TRIP COST: _____**