



**Seventh Grade**

**Project Based Lessons**

**Teacher Materials**

**Summer Dreamers**





## **BUYING A CAR**

**Begin Project during**

**WEEK 1**

*By the end of this project each student should have real-world knowledge of what is required to buy a car in the state of Pennsylvania. This project will focus on the following concepts previously learned:*

- **Rate**
- **Unit Rate**
- **Proportions**
- **Fractions/Decimals/Percents**

### **MATERIALS:**

*For each student:*

- **Project Worksheet: "Buying a Car"**
- **Computer/Internet Access**
- **Vehicle Advertisements (Newspapers/Magazines)**
- **Poster Paper/Chart Paper**
- **Markers**
- **Calculators**
- **Glue/Glue Sticks**

*Each student will display his/her poster of all of the necessary information, including a picture of the new car. A gallery walk of all completed projects is suggested.*

## BUYING A CAR

***Congratulations! You are about to buy the car of your dreams. What will you choose? How much will it cost? Where will you find a loan to pay for the car? How about gas mileage? What will the state of Pennsylvania require you to do before you can drive it?***

**The Car:** Browse through newspaper advertisements and/or vehicle magazines to find prospective vehicles that you would like to purchase. You may also use the internet to browse vehicles. Here are a few vehicle website to help you with your purchase:

- [www.edmunds.com](http://www.edmunds.com)
- [www.carmax.com](http://www.carmax.com)

Once you have located the car of your dreams, you must provide the following information in your project:

- **Dealership Information**
- **Make/Model/Year**
- **Standard Features**
- **Options (if you are requesting any)**
- **Extra Cost for all additional Options**
- **Total Cost of your car**

### **Gas Mileage**

You may use [www.fueleconomy.gov](http://www.fueleconomy.gov) to assist in finding out useful information regarding gas mileage of your vehicle.

- **Find the gas mileage for your new car (miles per gallon / mpg). There will be two numbers; the “in town” mpg and the “highway” mpg (Ex: 20/27 mpg).**
- **Find the cost of gas for your car for one year.**

## **Bank Loan**

You may use [www.bankrate.com](http://www.bankrate.com) to assist in finding lenders and lending information for your new car.

- Name of Lending Company
- Interest Rate
- Monthly payment for a 60 month (5 year) loan
- Total cost of the loan (monthly payment x 60 months = total cost)
- Amount of interest paid (total loan cost – cost of car = interest)

## **Pennsylvania Motor Vehicle Commission**

Visit [www.dmv.state.pa.us](http://www.dmv.state.pa.us) to assist you with PA state laws required for vehicle purchases.

List the amounts that you will pay for the following:

- PA State taxes
- Title
- Registration

## **Vehicle Insurance**

Find an insurance company to insure your new vehicle. You may look at any or all of the suggested sites to get the best rate:

- [www.geico.com](http://www.geico.com)
- [www.statefarm.com](http://www.statefarm.com)
- [www.progressive.com](http://www.progressive.com)

Once you have found an insurance company, provide the following:

- Company Name
- Payment Plan (Monthly, Quarterly, Biannually, Annually)
- Cost of car insurance for one year



## **I NEED A LARGER RECIPE!**

**Begin Project at the beginning of**

**WEEK 3**

*By the end of this project each student should have real-world knowledge of what is required to increase the size of a recipe to accommodate a larger group of people using what they know about equivalent fractions, ratios, and proportions. This project will focus on the following concepts previously learned:*

- **Equivalent Fractions**
- **Ratios**
- **Proportional Relationships**

### **MATERIALS:**

*For each student:*

- **Project Worksheet: “I Need a Larger Recipe”**
- **Computer/Internet Access**
- **Poster Paper/Chart Paper (Optional)**
- **Markers**
- **Calculators**

*Each student will display his/her poster of all of the necessary information. Students can work with a partner or individually. It is suggested that students present results to the class.*



**I NEED A LARGER RECIPE!!!**



You will apply ratios and proportions to help you convert a recipe to serve more people.

*You have found your favorite recipe for a dessert or appetizer and want to bring it to the class party. The problem is that your recipe doesn't serve enough people. Use proportions to increase the recipe to serve all of the people in your class including your teacher. Make enough for 1 serving per person.*

***For this project you will need to:***

1. Choose one recipe from the internet, cookbook or home.  
([www.recipes.com](http://www.recipes.com) , [www.allrecipes.com](http://www.allrecipes.com) ,  
[www.foodnetwork.com/recipes](http://www.foodnetwork.com/recipes) )
2. The recipe must have at least 8 ingredients, must have the number of portions it makes, and it must serve greater than 4 people, but less than 10 people.
3. Use proportions to increase the recipe to serve the number of people in your class, including your teacher (1 serving per person).
4. Create a brochure that includes the following: (*Use attached table to assist you*)
  - Original Recipe
  - Ratio for one serving, for example: if the recipe uses 1 cup of sugar, and the recipe serves 8, the ratio for one serving equals  $\frac{1}{8}$  c. sugar (THINK UNIT RATES!!!)



- Proportion used to increase recipe to number of servings to give one portion to each person in the class including the teacher.
- Show ALL work to solve proportions.
- Round your measurements to the nearest HALF (i.e. 3.222 teaspoons, rounds to 3 teaspoons, 3.666 teaspoons rounds to 3 ½ teaspoons.
- Scaled Recipe – Ingredients and new amounts needed to give one serving per person in class.
- Explain the math you used to solve this problem. Your strategies!!!
- Directions on how to make the recipe.
- Be creative! Use drawings, pictures, etc. to demonstrate your knowledge of ratios and proportions.





## Rubric for the Project

	<b>Kitchen Assistant</b>	<b>Line Cook</b>	<b>Sous Chef</b>	<b>Executive Chef</b>
<b>Using Proportions</b>	Fails to use proportions to increase a recipe	Set up proportions that are incorrect for increasing a recipe	Correctly set up proportions to increase a recipe with 1-2 minor errors	Correctly set up proportions to increase a recipe
<b>Using Cross Products or Equal Ratios</b>	Fails to use cross products or equal ratios to solve proportions. More than 5 errors and/or missing work	Use of cross products or equal ratios to solve proportions, however contains 3-5 errors	Reasonably uses cross products or equal ratios to solve proportions. Only 1-2 minor errors	Demonstrates the ability to use cross products or equal ratios efficiently and accurately to solve proportions. No errors in calculations
<b>Increasing a Recipe</b>	Includes a significantly flawed calculation of the amounts needed to increase a recipe. Does not round correctly to nearest half	Includes a calculation of the amounts needed to increase a recipe that contains some errors. Inaccurately rounded some measurements	Includes a reasonable calculation of the amounts needed to increase a recipe rounded to nearest half with only a couple of minor errors	Includes an accurate and complete calculation of the amounts needed to increase a recipe. Correctly rounded measurements to nearest half.
<b>Conceptual Understanding</b>	Describes strategies for setting up and solving proportions that shows little understanding of concepts	Describes strategies for setting up and solving proportions that shows some understanding of the concepts	Describes strategies for setting up and solving proportions that show a good understanding of the concepts	Describes strategies for setting up and solving proportions that show a strong understanding of the concepts.
<b>Brochure Presentation</b>	Brochure lacks both organization and required information. Brochure looks messy and is difficult to understand.	Brochure lacks organization but includes most of the required information. Overall appearance could be improved.	Organized brochure with all required information. Overall appearance looks good.	Creative, neat, organized brochure with all required information, at least 8 ingredients, typed with pictures or drawings.





## Investigating Unit Rates

**Begin Project at the beginning of**

**WEEK 4**

*By the end of this project each student should have real-world knowledge of what is required to shop for the best value and incorporate coupons. This project will focus on the following concepts previously learned:*

- **Rate**
- **Unit Rate**

### **MATERIALS:**

*For each student:*

- **Project Worksheets 1-5 “Investigating Unit Rates”**
- **Computer/Internet Access**
- **Poster Paper/Chart Paper**
- **Markers**
- **Calculators**

Students will complete 5 sections on this project, all which incorporate the use of rates and unit rates.

**Part I: Choose the product** (Use Internet for prices: [www.netgrocer.com](http://www.netgrocer.com) )

Choose a product that has two sizes. Record the price and unit rate of each size. Compare the unit rate for each product, and then tell which product is the better buy.

Item	Size #1	Size #2	Which is the better buy?
<b>Example:</b> Kraft Mac & Cheese	Price: \$3.46/8 oz. Unit Rate: \$0.43/oz.	Price: \$2.89/6 oz. Unit Rate: \$0.48/oz.	Size #1 because it is cheaper by 5 cents!
	Price:  Unit Rate:	Price:  Unit Rate:	
	Price:  Unit Rate:	Price:  Unit Rate:	
	Price:  Unit Rate:	Price:  Unit Rate:	
	Price:  Unit Rate:	Price:  Unit Rate:	
	Price:  Unit Rate:	Price:  Unit Rate:	

**Part II Find the product**

Using these specified products, locate the price at the grocery store and calculate the unit rate per one piece, instead of per one ounce/lb as given to you on the price tag.

Item	Rate/Unit Rate
Wonder Bread White Bread (Regular Size/Type)	Price:  Price per slice:
Chip's Ahoy – Chocolate Chip (Regular Blue Bag)	Price:  Price per cookie:
Crayola Markers (Thin or fat-tipped)	Price:  Price per marker:
Bottled Water (24-pack)	Price:  Price per bottle:

How would using a coupon change the unit rate/price per item?

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**Part III – How much would you save?**

Using the products from Part I, calculate the cost if you bought each item once a week for an entire year. Then calculate how much you would save per year by buying the cheaper item.

<b>Item</b>	<b>Size #1</b>	<b>Size #2</b>	<b>How much would you save?</b>
	Price:  Price per year:	Price:  Price per year:	
	Price:  Price per year:	Price:  Price per year:	
	Price:  Price per year:	Price:  Price per year:	
	Price:  Price per year:	Price:  Price per year:	
	Price:  Price per year:	Price:  Price per year:	



1. How much would you save buying all 5 of the items listed over the span of one year?

2. If you used a coupon that took off 50 cents from either price, how much would you save by using that coupon every week for a year?

#### Part IV Which One is Better?

Jeanie sells M&Ms out of her giant bag at 4 for 5 cents. The machine at the store sells you 9 for 25 cents. Which is the better deal for you? Show your work.

Tom sells baseball cards at 10 for 35 cents. Is that a better deal than 12 for 40 cents? Prove your thinking.

The hardware store sells sparklers for the 4<sup>th</sup> of July. They charge 19 cents apiece. The fireworks stand charges 85 cents for four. Which is the better deal? How can you tell?

Frosted Flakes has 11 grams of sugar in each 1 ounce serving. Raisin bran has 13 grams of sugar in each 1.4 ounce serving. Which one has less sugar for an ounce of cereal? How can you tell for sure? Prove your answer.

## Part V Ratios and Unit Rates

Change the ratios below to unit rates. An example is given.

Ratio	Rate (Ratio as a fraction)	Unit Rate
1) 228 miles in 6 hours	$\frac{228 \text{ miles}}{6 \text{ hours}}$	38 mph or $\frac{38 \text{ mi}}{1 \text{ hour}}$
2) 372 students for 12 teachers		
3) \$47.95 for 7 hours work		
4) \$5.40 for 1 dozen bagels		
5) 57 sit-ups in 3 minutes		
6) 500 words read in 8 minutes		
7) 216 miles on 16 gallons of gas		

