Nicole Hebert
Grade 7
Let's Make a Deal (Unit Rates)

Room: Stewart

Time Required: 50 minutes

Standard: 7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2 / 1/4 miles per hour, equivalently 2 miles per hour.

Materials:
Unit Rate Video http://www.youtube.com/watch?v=C1R7SD3fNjw
Lyrics to unit rate song (attached)
Computer with access to the Internet
"Let's Make a Deal" worksheets (Created by Mrs. Satt 2012)
"Grocery Store Math Ratios" worksheets
Grocery flyers
Calculators
Pencils

Objective: Using arithmetic skills, logic and reasoning, students will be able to find the "best deal" by computing unit rates of a given product (i.e. which product is cheaper per unit?).

Introduction:
The teacher will:

- Show the video on unit rates and pass out lyrics so the students may follow along (attached).

The students will:

- Be given the opportunity to ask questions about concepts in the video after the video has finished playing.

Before:
The teacher will:

- Explain that a rate is a ratio that compares two terms of different units. For example, miles per hour is a rate comparing distance and time.
- Unit rates have a denominator of 1 since the (in this case) price is being compared to 1 unit. (1 slice, 1 cookie, 1 gallon, etc.)
- Ask the students if they can think of other unit rates they encounter in their everyday lives. (Dollars per hour wages, gallons per second, beats per minute, etc.)
- Explain to the students that we will be trying to find the best deal on products we use every day. We can do this by dividing the price of the product by how many are in a given package. For example Sargento cheese slices are $2.48 for 10 slices and Velveeta cheese slices are $3.18 for 12 slices. We want to find the BEST deal. So we must find out the prices PER SLICE of each type of cheese. To do this, we can divide $2.48 by 10 slices. This means that Sargento cheese is .25

per slice. We will divide $3.18 by 12 slices to find the price per slice of Velveeta cheese. Velveeta cheese is .27 per slice. So the Sargento cheese, although it comes in a package with less slices is a better deal PER SLICE. However, explain to the students that the Sargento cheese is real cheese versus the processed Velveeta cheese. This may also account for the price difference.

- *The students may have some trouble with the concept that they could pay only 70 cents more for two more slices of cheese and buy the Velveeta instead of the Sargento cheese. To them, this may seem like a better deal before compute the actual unit prices of the cheese. We do it all the time in the grocery store without computing the unit rates of given products. To address this, it will be important to explain the students that finding the price PER UNIT is very important because that is how we will find the BEST possible deal. We are NOT estimating!*
- Do more examples with the students:
    - At Walmart, I can buy a 5 pack of macaroni and cheese for $4.50. What is the unit price per box? (Divide $4.50 by 5 to get the unit price. The unit price is 90 cents per box. Make sure the students are remember the units. The unit price is NOT 90 cents, it is 90 cents PER BOX. Units are very important).Talk briefly with the students about how this is a case where it is cheaper to buy in bulk. A box of Kraft macaroni and cheese by itself is 98 cents, so by buying the pack of 5 you will save 40 cents even though it is more expensive upfront.
    - If Ms. Miller bought 3lbs of apples at Super One for $3.78 and Mr. Stewart bought 5lbs of apples at Econo Foods for $6.50, who got the better deal? (Divide $3.78 by 3 to get the price per pound that Ms. Miller paid. Ms. Miller paid $1.26 per pound of apples. Divide $6.50 by 5 to get the price per pound that Mr. Steward paid. Mr. Stewart paid $1.30 per pound. Ms. Miller got the better deal).
- Ask if students can turn to a partner and explain what a unit rate is in their own words. After they have shared for 30 seconds or so, call on a couple students to give their answers.
- Explain to the students that they will follow the same process above for the remaining products in the activity.
- Pass out the “Let’s Make a Deal” worksheets.

The students will:

- Provide other examples of unit rates.
- Ask questions as needed.

During:

The teacher will:

- Observe students working in pairs and student though process about what product is the best deal based on unit rates.
- Ask students questions about their work and thought process. (What is the best deal on turkey? How do you know this? Can you tell me the unit price of the turkey per pound?).
- Ask students if there are any products on the worksheets that they would purchase even though they may not be the best deal.
- *I think students may have a little trouble with the unit rates all having different labels (slices, pounds, crayons, etc.). I think it will be important to explain to the students that the PRICE will always be on top (when dividing the two quantities) because we want the PRICE PER UNIT of a given product. However, it will also be important to explain that we must find what it is we are looking for in a given situation because all problems with unit rates will not be the same.*

The students will:

- Work in pairs to complete the activity.
- Ask questions as needed.
- Use background knowledge of ratios and rates to find unit rates of given products.
- Use logic and reasoning to find the best deal.

After:

The teacher will:

- Begin discussing the assignment by telling students to give a thumbs up if they thought option 1 was a better deal or a thumbs down if they thought option 2 was the better deal.

	Option 1	Option 2
Sargento vs. Velveeta	.25 per slice	.27 per slice
Oreo vs. Chips Ahoy	.19 per ounce	.18 per ounce
Doritos vs. Cheetos	.38 per ounce	.23 per ounce
Sarah Lee turkey vs. Butterball turkey	6.58 per pound	5.58 per pound
Coca-Cola vs. Pepsi	1.03 per liter	1.25 per liter
Cheerios vs. Apple Jacks	.216 per ounce	.22 per ounce
Kidney beans vs. Lima beans	1.18 per pound	1.07 per pound
Goldfish crackers vs. Cheese-its	.28 per ounce	.20 per ounce
Daisy sour cream vs. Kraft sour cream	.19 per ounce	.16 per ounce
Crayola crayons vs. Rose Art crayons	.058 per crayon	.06 per crayon

- *I think that the students may get confused with the products that round up to the same amount. For example, Cheerios and Apple Jacks both round to .22 per ounce. Crayola crayons and Rose Art crayons both round to .06 per crayon. Usually stores will always round up, so technically the prices on these products will be the same. However, for the sake of the activity, the prices before rounding will be the best deal.*

The students will:

- Be a part of the classroom discussion through think-pair-share and other discussion prompts.
- Use reasoning and logic to explain their answers to the questions.

Closure:

The teacher will:

- Collect student work.
- Go over any questions.
- Put exit ticket problem on overhead/board. (Your mother sends you to pick out your school snacks. She said you must come back with granola bars, some kind of snack mix, and cookies. Your choices are the following:

  13 count Quaker Chewy Bars for $3.98
  5 count Nature Valley Protein Granola Bar for $2.68

  14.5 oz. Gardetto's for $2.98
  26 oz. Great Value Peanut Butter Trail Mix for $4.98

14 oz. Fig Newtons cookies for $3.68
15.35 oz. Double Stuff Oreos for $2.98

What is the best deal on granola bars (what is the unit price)? Snack mix? Cookies? How much money will you need all together to purchase the school snacks assuming there is no sales tax?)

	Option 1	Option 2
Quaker vs. Nature valley	.30 per granola bar	.54 cents per granola bar
Gardetto's vs. Trail Mix	.21 per ounce	.19 per ounce
Fig Newtons vs. Oreos	.26 per ounce	.19 per ounce

Quaker chewy bars, trail mix, and Oreo cookies are the best deals. All together you will need $3.98 + $4.98 + $2.98 to purchase the snacks. So you will need $11.94.

- *Students may have difficulty with the concept that although the trail mix is more expensive, it is a better deal per ounce. Their parents may say "get the Gardetto's because they are cheaper." However, PER OUNCE, the trail mix is a better deal. The trail mix will last longer as a snack and is cheaper per ounce.*

The students will:

- Turn in assignment.
- Ask questions as needed.
- Complete exit ticket problem.

Accommodations:
Students with difficulty in math will be given a similar but shorter assignment (i.e. 5 option comparisons instead of 10). Students who finish early will be given a connection or extension problem (see below).

Connections/Extensions:
If a student finishes the other activity early, they may work on the following extensions:

1. Complete the grocery store ratios worksheet. In this scenario, you have to do the shopping for Thanksgiving dinner. You must choose at least 2 different grocery store flyers and find the best deal for everything you are going to need.
2. Design your own "Let's Make a Deal" game with different products from the grocery store flyers. Make sure to find the unit prices!

Assessment:
Student problems will be turned in. The teacher will be able to see if students understand the concept of unit rates by listening to student conversations as they work through the problems. Each problem will be assessed using the rubric below.

Rubric:

	1 points	.5 points	0 points
The mathematical process is shown	Each step of the mathematical process is clearly shown with correct work.	Some steps are shown with correct work.	No steps are shown.
Units are included	The answer includes a correct unit label.		The answer does not include a correct unit label.
Correct Answer	All the mathematical process work is correct along with the answer.	Some of the mathematical process work is correct, but the answer is incorrect. OR The mathematical process work is incorrect (or not shown), but the answer is correct.	The answer is incorrect.

Reflection:

Unit Rate Lyrics:

Hey Jess and Alyssa, can you teach me about unit rates?

Per, per, per, per (x 6)

Unit, unit, unit, rate (x 4)

Chorus:
A rate is a ratio that compares two terms of different units
A unit rate is the rate for one unit of a given quantity.

Verse 1:
Walk into the math class like teach me about unit rates
So pumped gonna teach you about it today
Before we start gotta learn the magic word
Three little letters, those letters are PER

Little Jon is making cookies
He is a baking
24 treats he can make in 30 minutes
Follow me now make sure your head is in it
That means he can make 48 cookies
PERRRRRR……hour!

A unit rate describes how many units of a quantity correspond to the second type of quantity
Miles per hour, inches per minute, earnings per week, and gallons per second

I'ma teach you unit rates, I'ma teach you unit rates
No for real, ask Ms. Perone, we will teach you unit rates

Sally rides 50 miles in 2 hours
All you gotta do is put 50 miles over 2 hours
Divide 50 by 2, divide 50 by 2
That equals 25 miles for 1 hour
See unit rate is easy
I knew that you could do it

Bringin' unit rates to math class
Makin' it a hit

Make sure you can write unit rate
To number one
It's not hard to do, but we aren't done

Chorus

Verse 1

PERRRR
Unit rates!
Yeah!

Chorus

I'll teach you ratios
I'll show you how it goes
I'll teach you ratios
In that schoolhouse down the road (x 2)

Chorus

A unit rate's a ratio?

WE LOVE UNIT RATES!
YEAH!

Worksheet Information:

1) Option 1 is the better deal. You divide $2.48 by 10 and $3.18 by 12 to get the unit prices. The unit price of Sargento is 25 cents per slice. The unit price of Velveeta Cheese is 27 cents per slice.

2) Option 2 is the better deal. You divide $2.98 by 15.5 oz. to get 19 cents per ounce for Oreos. You divide $2.50 by 14 oz. to get 18 cents per ounce for Chips Ahoy.

3) Option 2 is the better deal. You divide $4.39 by 11.5 oz. to get the unit price of 38 cents per ounce for Doritos. You divide $2.24 by 9.75 oz. to get the unit price of 23 cents per ounce for Cheetos.

4) Option 2 is the better deal. You know the unit price of Sarah Lee Turkey is $6.58 per pound. You divide $11.16 by 2 pounds to get the unit price of $5.58 per pound for Butterball Turkey.

5) Option 1 is the better deal. You divide $1.29 by 1.25 L to get the unit price of Coca-Cola which is $1.03 per liter. You divide $2.49 by 2 L to get the unit price of Pepsi which is $1.25 per liter.

6) Option 1 is the better deal. You divide $3.68 by 17 oz. to get the unit price for Cheerios which is .216 per ounce. You divide $2.89 by 13 oz. to get the unit price for Apple Jacks which is .22 per ounce. Even though stores would round the price for Cheerios to .22 per ounce, for this activity we will use the price per ounce before rounding on this problem.

7) Option 2 is the better deal. You know that the unit price of Kidney beans is $1.18 per pound. You divide $2.13 by 2 pounds to get the unit price for Lima beans which is $1.07 per pound.

8) Option 2 is the better deal. You divide $1.99 by 7.2 oz. to get the unit price for Goldfish Crackers which is 28 cents per ounce. You divide $2.70 by 13.7 oz. to get the unit price of Cheese-Its which is 20 cents per ounce.

9) Option 2 is the better deal. You divide $1.49 by 8 oz. to get the unit price of Daisy Sour Cream which is 19 cents per ounce. You divide $2.55 by 16 oz. to get the unit price of Kraft Sour Cream which is 16 cents per ounce.

10) Option 1 is the better deal. You divide $6.97 by 120 to get the unit price of Crayola Crayons which is .058 per crayon. (Again, for this problem we will use the price per crayon before rounding). You divide $1.53 by 24 to get the unit price of Rose Art Crayons which is .06 per crayon.