GED Math and Chocolate Chip Cookies
Shawna Huggins, M.A.
www.learningisfun.biz

Learning Objectives:

1. Playing with Fractions, Decimals, Proportions (ratios), and Percentages.
2. Understanding Story Problems

Chocolate Chip Cookie Recipe (public domain)

Ingredients

1 ½ cups all-purpose flour
1 tsp. Baking soda
1 tsp. Salt
1 cup (2 sticks) butter softened
½ cup granulated sugar
1 cup packed brown sugar
1 tsp. vanilla extract
2 large eggs
2 cups (One 12 oz. pkg.) Semi-sweet chocolate chips
2 cups old-fashioned rolled oats

Directions

1. Preheat oven to 350°F. Grease baking sheets.
2. Combine flour, salt and baking soda. Beat together shortening, sugars and vanilla in a large bowl until creamy.
3. Add eggs, beating until light and fluffy.
4. Gradually beat in flour mixture and rolled oats. Stir in chocolate chips.
5. Drop batter by well-rounded teaspoons full on to greased baking sheets. Bake 8 to 10 minutes or until golden.
6. Cool cookies on sheets on wire rack for 2 minutes. Remove cookies to wire rack to cool completely.

Playing with Fractions

Lesson

1. If I need 1 ½ cups of flour for one batch of cookies, how many cups of flour do I need for two batches?

Example: 1 ½ + 1 ½ = 1 + 1 + ½ + ½ = 3

I need 3 cups of flour for two batches of cookies.

Practice

2. How many cups of flour do I need for three batches of cookies?

3. How many cups of granulated sugar do I need for four batches of cookies?

Lesson

4. How many cups of flour do I need for 25 batches of cookies? To figure this out you need to know how to multiply fractions. The easiest way to figure this out is to convert the fraction to a decimal lickity split.

To convert a fraction to a decimal, divide the numerator (top number) by the denominator (bottom number).

½ = 1 divided by 2 = .5

1 ½ = 1.5

1.5 x 25 = 37.5

Practice

A. How many cups of flour do you need for 12 batches of cookies?

B. How many cups of flour do you need for 103 batches of cookies?

Practice what you've learned

Double the original recipe

_____cups all-purpose flour

_____tsp. Baking soda

_____tsp. Salt

_____cups (_____ sticks) butter

_____cup granulated sugar

_____cup packed brown sugar

_____tsp. vanilla extract

_____large eggs

_____cups Semi-sweet chocolate chips

_____cups old-fashioned rolled oats

Triple the original recipe

_____cups all-purpose flour

_____tsp. Baking soda

_____tsp. Salt

_____cups (_____ sticks) butter

_____cup granulated sugar

_____cup packed brown sugar

_____tsp. vanilla extract

_____large eggs

_____cups Semi-sweet chocolate chips

_____cups old-fashioned rolled oats

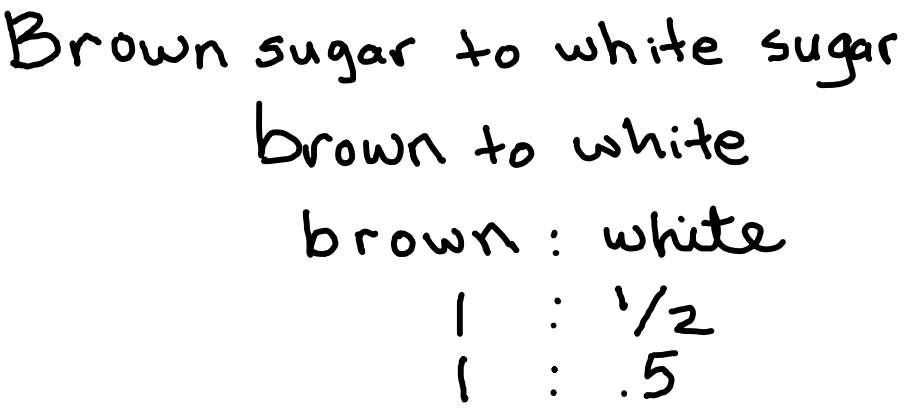
Playing with Proportion/Ratio

Lesson

What is the ratio of brown sugar to white sugar?

brown sugar = 1 cup

white sugar = 1/2 cup changed to a decimal is .5 cup



The ratio of brown sugar to white sugar is 1 to .5 or 1: .5

Practice

Use the original recipe to answer the following questions:

5. What is the ratio of cups of flour to cups of brown sugar?

6. What is the ratio of number of eggs to cubes of butter?

7. What is the ratio of cups of granulated (white) sugar to cups of flour?

8. What is the ratio of cups of chocolate chips to cups of oats?

Lesson

9. If I have a recipe that calls for 10 cups of brown sugar, how many cups of white sugar will I need? Look at the example on the next page to figure this out using the magic conversion box and cross multiplying.

I know you can probably do this problem in your head, but let's use the magic conversion box:

Brown : white

1 : .5

Brown	1	10
white	.5	x

We read this by saying the ratio of brown to white is 1:.5

If brown is 1 to white .5 then brown is 10 to white x

Cross multiply by multiplying the diagonals:

$1x = .5(10)$

$1x = 5$

$x = 5$

Using the conversion box, cross multiplying, and then solving for x is the most fun way to do proportion questions.

Practice

Here are more to practice on. Use the proportions in the original recipe to help you solve these questions.

10. If I need one cube of butter for every three eggs, what is the ratio of butter to eggs?

11. If I use six cubes of butter, how many eggs do I need?

12. If I have 12 eggs, how many cubes of butter do I need?

13. Answer the following question using the page of data where you doubled and then tripled the cookie batches. What is the ratio between the cups of flour used in the original recipe to the number of cups of flour used in the tripled batch recipe?

Playing with Percentages

Lesson
Percentages are so easy. If I want to find 50% of 326, I simply multiply 326 by .5

To change percent to a decimal do the following:

$$50\% = \frac{50}{100} = \frac{50}{100} = \frac{5}{10} = \frac{1}{2}$$

$$\frac{1}{2} = 1 \div 2 = .5$$

Remember that 50 % means 50 per cent or 50 per one hundred as in 50/100. Simply divide 50 by 100 and you'll get .5. This works on all percentages.

25% is .25
37% is .37
1 % is .01
112% is 1.12

If it costs $10 to make a batch of cookies, how much do I need to charge for the entire batch to make my cost plus 20%?

I need to figure out what 20% of $10 is. So, I convert the 20% to a decimal or .2 then I multiply 10 by .2 and get $2.00. I will need to charge $12 for the batch of cookies to make $2 above cost.

Cost	$10
plus 20%	$2
Charge	$12

So cost plus 20% = 10 + 2 = 12. (hint - advanced math students can figure out what to charge for the batch by finding 120% of the cost. Think about it).

Practice

14. If each batch costs $8.53 to make, how much do I need to sell the whole batch for to make 50% profit?

15. In question 14, if each batch makes three dozen cookies, how much do I need to sell each cookie for to make 50% profit?

16. If each batch costs $6.37 to make, how much do I need to sell the batch for to make 27% profit? If this batch makes 2 dozen cookies, how much do I need to sell each dozen for?

Think of your own questions - have fun - and Thanks For Playing!

KEY

1. 1 ½ + 1 ½ = 1 + 1 + ½ + ½ = 3

2. 1.5 x 3 = 4.5 or 4 ½ cups of flour

3. ½ x 4 = .5 x 4 = 2 cups of white sugar

Lesson

4. 1.5 x 25 = 37.5

A. 1.5 x 12 = 18

B. 1.5 x 103 = 154.5 or 154

Double the original recipe

_3_____cups all-purpose flour

__2____tsp. Baking soda

__2____tsp. Salt

__2____cups (____4__ sticks) butter

__1____cup granulated sugar

_2_____cup packed brown sugar

__2____tsp. vanilla extract

___4___large eggs

___4___cups Semi-sweet chocolate chips

___4___cups old-fashioned rolled oats

Triple the original recipe

____4½__cups all-purpose flour

__3____tsp. Baking soda

__3____tsp. Salt

____3__cups (___6___ sticks) butter

_1 ½_____cup granulated sugar

___3___cup packed brown sugar

__3____tsp. vanilla extract

__6____large eggs

___6___cups Semi-sweet chocolate chips

___6___cups old-fashioned rolled oats

5. What is the ratio of cups of flour to cups of brown sugar?
   F : BS

   1.5 : 1

6. What is the ratio of number of eggs to cubes of butter?

   2 : 2 or 1:1

7. What is the ratio of cups of granulated (white) sugar to cups of flour?

   .5 : 1.5

8. What is the ratio of cups of chocolate chips to cups of oats?
   2:2 or 1:1

9. If I have a recipe that calls for 10 cups of brown sugar, how many cups of white sugar will I need? Look at the example on the next page to figure this out using the magic conversion box and cross multiplying.

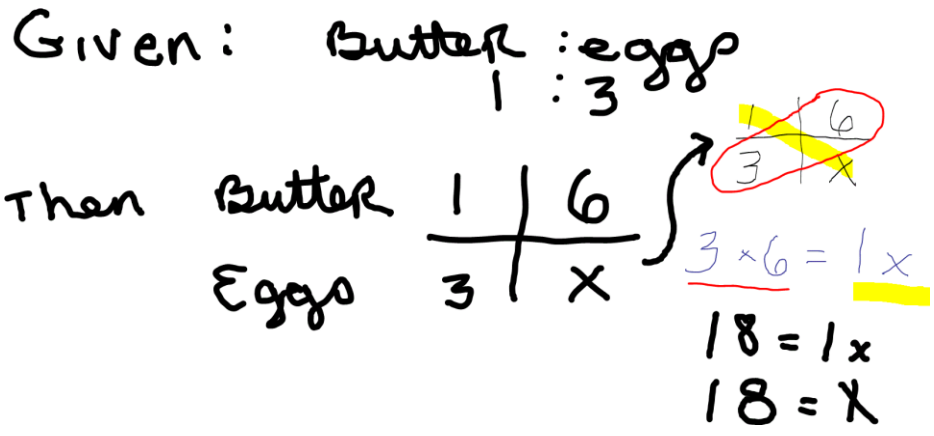
5 cups of white sugar

10. If I need one cube of butter for every three eggs, what is the ratio of butter to eggs?

One cube butter : 3 eggs
butter : eggs

1 : 3

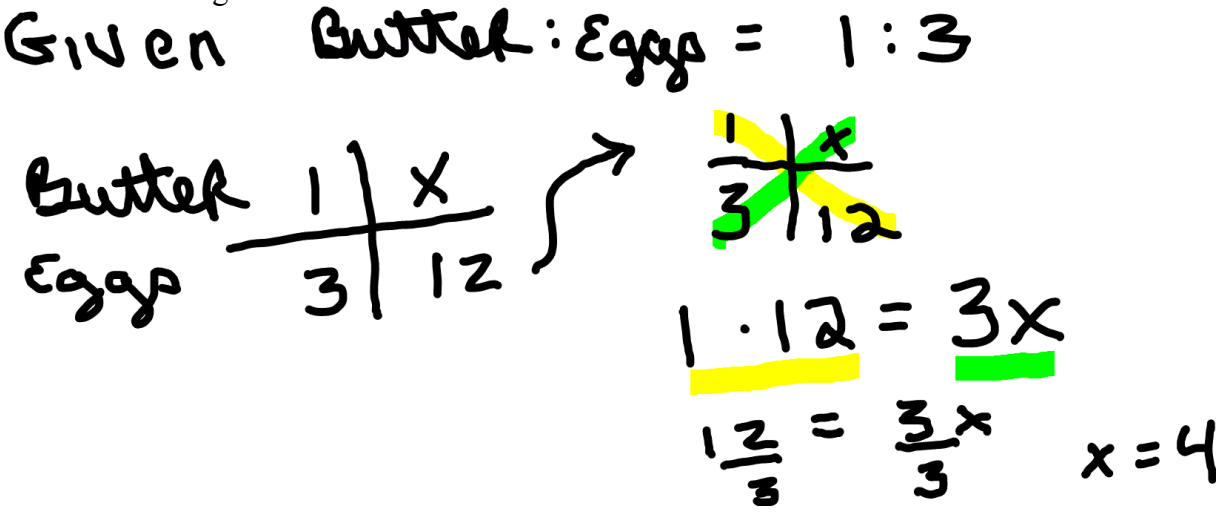
11. If I use six cubes of butter, how many eggs do I need?



12. If I have 12 eggs, how many cubes of butter do I need?

Use ratio given in number 10 butter : eggs = 1:3
One cube of butter needed for every three eggs

Now make a magic box

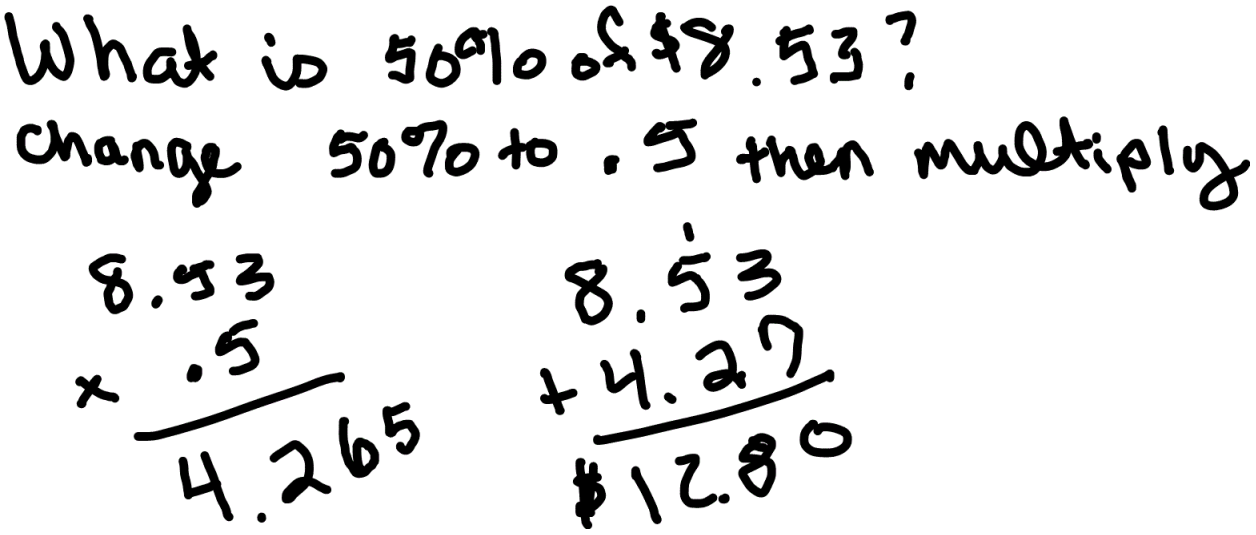


If I have 12 eggs I need 4 cubes of butter.

13. Answer the following question using the page of data where you doubled and then tripled the cookie batches. What is the ratio between the cups of flour used in the original recipe to the number of cups of flour used in the tripled batch recipe?

1.5 : 4.5 or 1 : 3

14. If each batch costs $8.53 to make, how much do I need to sell the whole batch for to make 50% profit?



15. In question 14, if each batch makes three dozen cookies, how much do I need to sell each cookie for to make 50% profit?

3 dozen cookies is 3 x 12 = 36.

12.80 divided by 36 = .35555 so .36 or 36 cents per cookie (because of rounding).

16. If each batch costs $6.37 to make, how much do I need to sell the batch for to make 27% profit? If this batch makes 2 dozen cookies, how much do I need to sell each dozen for?

Try this

6.37 x 127% or 6.37 x 1.27 = 8.0899 or $8.09 due to rounding.

2 x 12 = 24 cookies

$8.09 divided by 24 = about 34 cents per cookie