

Dimensional Analysis

November 7, 2016

Mr. Collin



Announcements

- Makeup project is due tomorrow (for those who did not complete it)
- I will be available after school today for extra help and/or test corrections
 - I will give out a worksheet before the end of this week for those who have done test corrections



Steps to Dimensional Analysis

- In a little while, I will give you a worksheet that has a portion of most problems completed
- Let's write out the steps for dimensional analysis



Steps to Dimensional Analysis

Step 1: Determine what conversion facts are needed

How many inches are in 12 feet?

What do we know?

What do we need?

There are 12 ft.
How many inches in one foot?



Steps to Dimensional Analysis

Step 2: Write the starting value with units as a fraction





Steps to Dimensional Analysis

Step 3: Determine what units you need in the end





Steps to Dimensional Analysis

Step 4: Write equivalent units between the two as fractions

12 feet	12 inches	? inches
	1 foot	



Steps to Dimensional Analysis

Step 5: Cancel out units

12 feet	12 inches	? inches
	1 foot	



Steps to Dimensional Analysis

Step 6: Multiply all numerators, then divide by all denominators

12 feet	12 inches	144 inches
	1 foot	



Worksheet

- I will hand out a worksheet that has the steps written on one side
- On the other side are five conversion problems
 - A portion of some has been done
- If you finish early, I will put some more challenging ones on the board



Dimensional Analysis

How many feet per second is a car going if it is driving at 60 miles per hour?

$$\frac{60 \text{ miles}}{1 \text{ hour}} \qquad \qquad \qquad \frac{\text{ft.}}{\text{Sec.}}$$

Dimensional Analysis

November 8, 2016

Mr. Collin



Warmup

- 1) If there are 2.54 cm in 1 inch, how many centimeters are in 100 inches? 254 cm
- 2) If there are 1000 grams in 1 kilogram, how many kilograms does an 800-gram weight weigh?



Trade and Grade

- If you received a stamp, you will trade your homework with the person sitting next to you (or someone else near you)
- When you get another person's homework, write your name in the "Corrected By" line at the bottom



Trade and Grade

1) 5 ft.

2) 15 yds.

3) 50 cm

4) 25.4 cm

5) 1200 cm

6) $\frac{23}{30}$

7) $\frac{13}{36}$

8) 120

9) 25

10) 0.5 or $\frac{1}{2}$

11) 4



Trade and Grade

- If six or more answers are correct and there is a stamp on the page, write “4” in the score box
- If five or fewer answers are correct, then write “2” in the score box



Announcement

- If you have not already done so, turn in your textbook project
- We will have a mini-summative test next Wed/Thu
- I will be here after school tomorrow



Dimensional Analysis

- Today we will again work on a worksheet
- Today's worksheet will involve changing units that have a dimension in the denominator

Proportions

November 9/10, 2016

Mr. Collin



Warmup

Reduce the following fractions:

$$1) \frac{21}{35} \quad \frac{3}{5}$$

$$2) \frac{12}{18} \quad \frac{2}{3}$$

$$3) \frac{24}{12} \quad \frac{4}{2} \quad \frac{2}{1} \quad \textcircled{2}$$

$$4) \frac{36}{48} \quad \frac{3}{4}$$

$$5) \frac{\cancel{70}}{\cancel{90}} \quad \frac{7}{9}$$

$$6) \frac{35}{45} \quad \frac{7}{9}$$



Trade and Grade

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Trade and Grade

- | | |
|---------------|---------|
| 1) \$1.24/L | 7) -17 |
| 2) 4.46 kg/m | 8) -20 |
| 3) \$0.03/oz. | 9) 11 |
| 4) 17.88 m/s | 10) 12 |
| 5) 5 | 11) -60 |
| 6) 14 | 12) -9 |



Trade and Grade

- If six or more answers are correct and there is a stamp on the page, write “4” in the score box
- If five or fewer answers are correct, then write “2” in the score box



Proportional Relationships

- **Proportional Relationship**

A relationship where one number is multiplied by a constant to get a second number



Example

Proportional

Let's look at a table:

# of pizza slices	0	1	2	3	4
Cost	\$0	\$4	\$8	\$12	\$16

Common Ratio - Number that is multiplied



Example

Let's look at a different table:

Miles driven in cab	0	1	2	3	4
Cost	\$7	\$10	\$13	\$16	\$19

Nonproportional



Proportional Relationship

- If you can multiply one variable by a constant to get the other variable, then it is proportional
- In the pizza example, what did we multiply the number of slices by?

$$\frac{4}{4} \text{ or } 1$$



Now You Try

Which table is of a proportional relationship?

Proportional

Height in inches	10	12	14	16	18
Width in inches	15	18	21	24	27

Nonproportional

Height in inches	10	12	14	16	18
Width in inches	20	22	24	26	28



Making a Table

A store sells tee shirts for \$12 apiece. Fill in the table below to determine how much you would spend on a certain number of shirts.

Number of shirts	0	1	2	3	4
Cost	\$0	\$12	\$24	\$36	\$48



Now You Try

A marathon runner takes 9 minutes to run one mile. Fill in the table below.

Number of miles	0	1	2	3	4
Minutes	0	9	18	27	36



From the Book

- Get your consumable textbook from the shelf
- You will work on pages 36–39