

You need out your warm up, agenda, hw

**Homework: Unit Rates. CALCULATOR**

Warm Up:

1) You need 6 cups of sugar to make 4 batches of cookies.  
How many cups per 1 batch?

$$\frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$$

$$\begin{array}{r} 4x = 6 \\ \hline 4 \quad | \quad 6 \\ \hline \end{array}$$

2) You can drive 210 miles in 3 hours. Find the unit rate.

$$\frac{\text{Money}}{\text{time}} = \frac{210}{3} = \frac{70}{1}$$

3)  $-4x + 12 = 24$

$$\begin{array}{r} - \quad -12 \\ \hline -4x = 12 \\ \hline -4 \quad -4 \\ \hline x = -3 \end{array}$$

There are 142 calories in 28 M&M's

$$\frac{\text{cals}}{\text{mnm}} = \frac{142}{28} = 5.07$$



A 12-count chick fil nugget box is 400 calories.

$$\frac{\text{cals}}{\text{nug}} = \frac{400}{12} = 33.3$$



There are 140 calories in a bag of Doritos that contains about 11 chips.

$$\frac{\text{cals}}{\text{chip}} = \frac{140}{11} = 12.7$$



There are 180 calories in 3 Oreo cookies.

$$\frac{\text{cals}}{\text{oreo}} = \frac{180}{3} = 60$$



### Unit Rates in the Real World-

The world's faster airplane can travel 6,579 miles in 3 hours.

$$\frac{6579}{3} = 2193 \text{ m/h}$$



$\frac{\text{miles}}{\text{hr}}$

The world's fastest car the Hennessey Venom GT can travel at 1,080 miles in 4 hours.

$$\frac{1080}{4} = 270$$



$\frac{\text{miles}}{\text{hr}}$

## UNIT RATES WITH COMPLEX FRACTIONS- NOTES

COMPLEX FRACTIONS: A fraction with a numerator, denominator, or both that are also fractions

EXAMPLES:	$\frac{20}{\frac{1}{2}}$	$\frac{\frac{1}{4}}{\frac{1}{2}}$	$\frac{\frac{1}{4}}{2}$
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**EXAMPLE:** Suppose a boat travels 20 miles in  $\frac{2}{3}$  hour. What is the average speed of the boat in miles per hour?

• STEP 1: **write the ratio**      **change it to division**

\*remember money over time!\*

$$\frac{20 \text{ miles}}{\frac{2}{3} \text{ hour}}$$

☺ (It's not that bad!!)

really is just means →

$$20 \div \frac{2}{3}$$

$$\begin{array}{r} 20 \div 2 \\ \hline 1 \quad 3 \\ \text{K C F} \end{array}$$

STEP 2: **Keep, change, flip**

$$\frac{20}{1} \cdot \frac{3}{2} = \frac{60}{2} = 30 \text{ miles per hour}$$

KCF

\*ALWAYS SIMPLIFY!

YOU TRY!

$$\frac{\frac{1}{4}}{\frac{7}{10}}$$

$$\frac{\frac{1}{4}}{\frac{7}{10}} = \frac{1}{4} \cdot \frac{10}{7} = \frac{10}{28} \div 2 = \frac{5}{14}$$

$$\frac{\frac{8}{9}}{\frac{6}{1}}$$

$$\frac{8}{9} \cdot \frac{1}{6} = \frac{8}{54}$$

$$\frac{8}{54} \div 2 = \frac{4}{27}$$

$$\frac{\frac{4}{5}}{10}$$

$$\frac{4}{5} \cdot \frac{1}{10} = \frac{4}{50}$$

$$\frac{2}{25}$$

4. Josh reads  $\frac{1}{6}$  of his book in  $\frac{1}{3}$  an hour. At this rate, how much of his book will he read in an entire hour? (Remember M/T)

$$\frac{m}{t} \frac{\text{books}}{\text{hr}}$$

$$\frac{\frac{1}{6}}{\frac{1}{3}}$$

$$\frac{1}{6} \div \frac{1}{3}$$

K C F

$$\frac{1}{6} \cdot \frac{3}{1} = \frac{3}{6}$$

5. Sarah needs  $\frac{1}{8}$  cups of sugar to make  $\frac{1}{4}$  of her cookie recipe. How much sugar does she need to make the entire recipe?

$$\frac{\text{sug}}{\text{CR}} \frac{\frac{1}{8}}{\frac{1}{4}}$$

$$\frac{1}{8} \div \frac{1}{4}$$

K C F

$$\frac{1}{8} \cdot \frac{4}{1} = \frac{4}{8} \left( \frac{1}{2} \right)$$

CUPS



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

Improper Fractions?

6. Maddy is making pillows. She brought  $2 \frac{1}{2}$  yards of fabric. Her total cost was \$15. What was the cost per yard?

$$\frac{m}{t} = \frac{\$}{yds} = \frac{15}{2 \frac{1}{2}}$$

$$\frac{15}{1} \div \frac{5}{2} = \frac{15}{1} \cdot \frac{2}{5} = \frac{30}{5} = 6$$

$$\frac{15}{1} \cdot \frac{2}{5} = \frac{30}{5} = \boxed{\$6}$$

7. Jake can jog  $1 \frac{1}{2}$  miles in  $\frac{1}{4}$  hour. Find his average speed in miles per hour.

$$\frac{m}{t} = \frac{\text{miles}}{\text{hr}} = \frac{1 \frac{1}{2}}{\frac{1}{4}}$$

$$\frac{3}{2} \div \frac{1}{4} = \frac{3}{2} \cdot \frac{4}{1} = \frac{12}{2} = 6$$

$$= \frac{12}{2} = \boxed{6 \text{ mile/hr}}$$

$$1 \frac{1}{2} \cdot \frac{2}{2} \rightarrow \frac{3}{2}$$

8. TJ reads  $7\frac{1}{2}$  pages of a mystery book in 9 minutes. What is her average reading rate in pages per minute?

$$7\frac{1}{2} = \frac{15}{2}$$

$$\frac{m}{t} = \frac{\text{pages}}{\text{min}} = \frac{\frac{15}{2}}{9}$$

$$\frac{15}{2} \div \frac{9}{1}$$

$$\frac{15}{2} \cdot \frac{1}{9} = \frac{15}{18}$$

$$\frac{5}{6}$$

9. A crew of highway workers paved  $\frac{2}{15}$  of a mile in 20 minutes. If they work at the same rate, how much of a mile will they pave in 1 hour?

$$\frac{m}{t} = \frac{\text{miles}}{\text{min}} = \frac{\frac{2}{15}}{20}$$

$$\frac{2}{15} \div \frac{20}{1}$$

$$\frac{2}{15} \cdot \frac{1}{20} = \frac{2}{300}$$

## UNIT RATES &amp; COMPLEX FRACTIONS- HOMEWORK

- 1) I can read  $\frac{1}{5}$  of a book in  $\frac{1}{7}$  of an hour. How much of the book can I read in one hour?
- 2) I can drive 350 miles in 5 hour. Find the unit rate.
- 3) You need  $\frac{1}{4}$  cups of sugar for  $\frac{1}{2}$  of the recipe. How much do you need for the entire recipe?
- 4) Your heart beats 246 beats in 3 minutes. Find the unit rate.

5)  $\frac{4\frac{1}{2}}{\frac{3}{4}}$

Sit silently for the news