



MATH WITH MR DJ

GRADE 7 · RATIOS & PROPORTIONAL RELATIONSHIPS

UNIT RATES WITH FRACTIONS

Today's goal: I can given a rate relationship between two quantities in a mathematical problem, calculate the unit rate, compute unit rates associated with ratios of fractions and given a rate relationship between two quantities in a real-world problem, calculate the unit rate.



Tan



Digit



Blaze



Pi



$\frac{1}{2}$ mile in $\frac{1}{4}$ hour

1 What is the speed in miles per hour?

TURN & TALK

bigger or smaller than $\frac{1}{2}$?



Unit rate = amount $\div$ units

- 1 “Per one hour” means divide by the number of hours.
- 2 $\frac{1}{2} \div \frac{1}{4}$ — Keep · Change · Flip.



BIG IDEA 2

$\frac{1}{2} \times \frac{41}{1} = 2$ miles per hour

- 1 A quarter hour is LESS than an hour, so a full hour goes further.

REMEMBER

An answer smaller than $\frac{1}{2}$ means you divided the wrong way.



BIG IDEA 3

Sense-check before you compute

1 Dividing by a fraction < 1 makes the answer BIGGER.

2 Dividing by a fraction > 1 makes it SMALLER.

REMEMBER

Predict the size first. Then check your arithmetic against it.



BIG IDEA 4

Two rates, one situation

1 $\frac{4}{5}$ gal in $\frac{2}{5}$ h $\rightarrow$ 2 gallons per hour.

2 Flip it $\rightarrow$ $\frac{1}{2}$ hour per gallon.

REMEMBER

They multiply to 1. Which one you want depends on the question.



SPOT THE SLIP!

Turn & talk

Something went wrong here...

THE PROBLEM

$\frac{1}{5}$ km in $\frac{3}{10}$ hour. Km per hour?

WHAT A STUDENT DID

Cancelled carelessly and got $\frac{1}{2}$.

YOUR MISSION

What went wrong? What's the right answer?



WATCH MR DJ SOLVE

Copy the steps

$\frac{1}{5}$ km in $\frac{3}{10}$ hour. Km per hour?

1 $\frac{1}{5} \div \frac{3}{10} = \frac{1}{5} \times \frac{10}{3} = \frac{10}{15} = \frac{2}{3}$.

Answer: **2 km/h**



YOUR TURN

Whiteboards up!

Pick your pepper!



🌶️ MILD

$\frac{1}{3}$ mile in $\frac{1}{9}$ hour. Miles per hour?

#1 on your practice sheet



🌶️🌶️ MEDIUM

$\frac{5}{6}$ litre in $\frac{1}{3}$ minute. Litres per minute?

#3 on your practice sheet



🌶️🌶️🌶️ SPICY

Look at your answer to question 5. Why is it less than 1, when questions 1–5 gave answers of 2 or more?

#7 on your practice sheet



How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Step-by-step videos on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

