



MATH WITH MR DJ

GRADE 7 · RATIOS & PROPORTIONAL RELATIONSHIPS

RECOGNIZING PROPORTIONAL RELATIONSHIPS

Today's goal: I can represent proportional relationships between quantities and recognize proportional relationships between quantities.



Tan



Digit



Blaze



Pi



Two tables

1 A: (2,6) (3,9) (5,15) (8,24)

2 B: (1,5) (2,7) (3,9) (4,11)

TURN & TALK

are both proportional? Both grow steadily.



The test: is $y \div x$ always the same?

1 A: 3, 3, 3, 3 $\rightarrow$ constant. Proportional, $k = 3$.

2 B: 5, $3\frac{1}{2}$, 3, $2\frac{3}{4}$ $\rightarrow$ not constant. Not proportional.



BIG IDEA 2

B grows by a steady 2 – and still fails

- 1 A constant DIFFERENCE is not a constant RATIO.
- 2 B is $y = 2x + 3$. Linear, but not proportional.

REMEMBER

Every proportional relationship is linear. Not the reverse.



BIG IDEA 3

The origin test

1 $y = kx$ means $y = 0$ when $x = 0$.

2 B gives $y = 3$ at $x = 0$ — it misses $(0, 0)$.

REMEMBER

Careful: $y = x^2$ hits the origin and is still NOT proportional.



BIG IDEA 4

The fastest screen: double x

- 1 Proportional: x doubles $\rightarrow y$ doubles. Always.
- 2 $y = 2x + 3$: x from 2 to 4 gives y from 7 to 11.
Not double.

REMEMBER

Any fixed starting amount destroys proportionality.



SPOT THE SLIP!

Turn & talk

Something went wrong here...

THE PROBLEM

For the pair (5, 15), find $y \div x$.

WHAT A STUDENT DID

Reversed the division.

YOUR MISSION

What went wrong? What's the right answer?



For the pair (5, 15), find $y \div x$.

1 $15 \div 5 = 3$.

Answer:

3



Pick your pepper!



MILD

For the pair (2, 6), find $y \div x$.

#1 on your practice sheet



MEDIUM

Those three pairs are proportional. Using k from above, find y when $x = 10$.

#3 on your practice sheet



SPICY

Two students test $y = 2x + 3$. One says “it adds 2 each time so it is proportional.” The other checks $x = 0$ and says it is not. Who is right, and what test settles it?

#8 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

