# Exploring Rates and Unit Rates

Lindsay delivers 232 newspapers in 4 hours.

- How would I explain this information as a _rate_?



- If Lindsay determined her _unit rate_ of newspaper delivery, what would she be calculating?



- How would I know when a _rate_ is also a _unit rate_?



- How would I explain and demonstrate calculating the _unit rate_ using the information shown below?

    *232 newspapers/4 hours*
    | ? | *newspapers/1 hour*



- Comparing the two _rates shown below,_ how might the _unit rate_ be considered more useful?

    *232 newspapers/4 hours*
    *58 newspapers/1 hour*

- Can I think of any conditions that could affect or change the <u>unit rate</u> shown below?

  *58 newspapers/1 hour*

Our previous solution for calculating the *unit rate* involved writing a fraction.

*232 newspapers / 4 hours*

$$\frac{232}{4} = 232 \div 4 = 58$$

- How would I explain my thinking when choosing the *numerator* and *denominator?*

A classmate attempted to determine the same *unit rate* using the solution shown.

$$\frac{232}{4} = \frac{\square}{1}$$

- How might I explain their reasoning in setting up this solution?

- When writing a *proportion* to solve a *rate* problem, what do I need to think about regarding the <u>units</u>?

$$\frac{232}{4} = \frac{\square}{1}$$

- How could I use my understanding of *equivalent fractions* to solve the *proportion?*

$$\frac{232}{4} = \frac{\square}{1}$$

- How would I demonstrate using an algebra approach to solve the same *proportion?*

$$\frac{232}{4} = \frac{\square}{1}$$
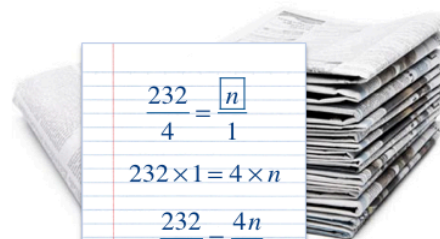
Comparing the two solutions shown below…

$$\frac{232}{4} = 232 \div 4$$
$$= 58$$

$$\frac{232}{4} = \frac{n}{1}$$
$$232 \times 1 = 4 \times n$$
$$\frac{232}{4} = \frac{4n}{4}$$
$$n = 58$$

- How would I describe them as being similar?

I could use either solution to calculate Lindsay's *unit rate* for delivering newspapers.

$$\frac{232}{4} = 232 \div 4$$
$$= 58$$

$$\frac{232}{4} = \frac{\boxed{n}}{1}$$
$$232 \times 1 = 4 \times n$$
$$\frac{232}{4} = \frac{4n}{4}$$
$$n = 58$$

Now, I'll use her *unit rate,* shown below, to solve some additional *rate* problems.

*58 newspapers/hr*

*How many newspapers would Lindsay deliver in 6 hrs?*

- How could I solve using a mental math calculation to adjust the *unit rate?*

I could also solve using a *proportion equation.*

- How would I set up or <u>write</u> the *proportion?*

- How would I explain and demonstrate solving the *proportion?*

I'll solve a new *rate* problem, shown below, using a *proportion equation.*

The *unit rate* shown in the *proportion* is 58 newspapers/hr.

$$\frac{58}{1} = \frac{435}{\boxed{n}}$$

- What am I being asked to calculate using the *proportion?*

- How would I explain and demonstrate using the *proportion* to solve*?*

I'm going to use the *unit rate* to calculate the quantity of newspapers delivered in 20 minutes.

$$\frac{58}{1} = \frac{\boxed{n}}{20}$$

- How would I explain the adjustment I need to make to the *proportion* in order to solve?

- How would I explain and demonstrate solving the *proportion?*

# Exploring Rates and Unit Rates

Which statements do I feel confident explaining and demonstrating?
Which statements do I <u>not</u> feel confident explaining and demonstrating?

✓ I can <u>explain</u> and <u>write</u> examples of a rate

✓ I can <u>explain</u> and <u>write</u> examples of a unit rate

✓ I can <u>explain</u> and <u>demonstrate</u> how I use a rate to calculate a unit rate

✓ I can <u>explain</u> and <u>demonstrate</u> writing a proportion equation to calculate a unit rate

✓ I can <u>compare</u> solving a proportion equation to calculating equivalent fractions

✓ I can <u>explain</u> and <u>demonstrate</u> how I solve a proportion equation using algebra