14.1

Ratios and Rates

Today's Learning Goals:

- I can find ratios, rates, and unit rates.
- I can find ratios and rates involving ratios of fractions.

Do Now

Convert the measurement.

1. 30 min = ___hr
2. 4 hr = ___min
3. 15 sec = ___min
4. 60 hr = ___days
5. 3 days = ___hr

What are ratios?

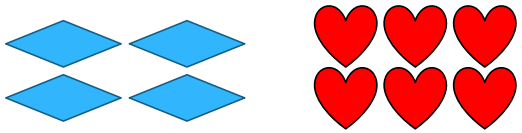
A ratio is a _____ between two things using _____

What is the ratio of stars to moons? Write this 3 different ways.

IN RATIOS, YOU ARE TO LEAVE ANY RATIOS "IMPROPER".

Simplifying Ratios

Ratios can act like fractions because they can be simplified like fractions.



To simplify a ratio, write it like a fraction and then simplify.

What are rates?

A rate is a ratio comparing _____ _____things.

$$\frac{15\ miles}{1\ hour}$$

$$8\ dogs : 7\ cats$$

$$17\ girls\ to\ 12\ boys$$

If you are comparing the same thing, it's a ratio but not a rate.

$$\frac{3\ \mathbf{min}}{15\ \mathbf{min}}$$

$$5\ cows : 7\ cows$$

UNIT RATE

A unit rate is a rate with a _____ ___ ____.
You use this to find how much you get for 1 thing.

Example 1

You are traveling 20 miles per hour for 4 hours. What is your unit rate?

$$\frac{20\ miles}{4\ hours}$$

Example 2

You paid $9.00 for 6 doughnuts. What is the unit rate for a doughnut?

$$\frac{\$9.00}{6\ \ donuts}$$

Example 3

There are 45 males and 60 females in a subway car.

1. **Find the ratio of males to females.**

The subway car travels 2.5 miles in 5 minutes.

2. **Find the speed of the subway car**

Finding a Rate from a Ratio Table:

The ratio table shows the costs for different amounts of artificial turf. Find the unit rate in dollars per square foot.

Amount (square feet)	25	100	400	1600
Cost (dollars)	100	400	1600	6400

Use a ratio from the table to find the unit rate.

Practice

1) There are 12 dogs and 15 cats at the pet store. Find the ratio of cats to dogs.

2) You bicycle 30 blocks in 20 minutes. Find your speed.

Practice

There are 45 males and 60 females in a subway car.

3) **Find the ratio of females to males.**

4) **Find the ratio of females to total passengers.**

Practice

5) The ratio table shows the distance that the *International Space Station* travels while orbiting Earth. Find the speed in miles per second.

Time (seconds)	3	6	9	12
Distance (miles)	14.4	28.8	43.2	57.6