

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Aim:** What are ratios and rates?

Do Now

Simplify each fraction to lowest terms.

a)  $\frac{12}{36}$   $\boxed{\frac{1}{3}}$     b)  $\frac{8}{11}$   $\boxed{\frac{8}{11}}$     c)  $\frac{48}{16}$   $\boxed{\frac{3}{1}}$     d)  $\frac{9}{9}$   $\boxed{\frac{1}{1}}$

In this unit, we will keep everything as a fraction of TWO numbers

don't use the whole #

What is a ratio?

A ratio shows the comparison of two or more values.

The 3 most common ways to write a ratio are: 1:2    1 to 2     $\frac{1}{2}$

Based on the video, express the bad date ratios in 3 different ways

Date 1	25:175 or 1:7	25 to 175	$\frac{25}{175}$
Date 2	36:6 or 6:1	36 to 6	$\frac{36}{6}$
Date 3	57:57 or 1:1	57 to 57	$\frac{57}{7}$

**Discussion**

- a) Match each description with a verbal rate.
- b) Match each verbal rate with a numerical rate.
- c) Give a reasonable rate for each description.
- d) Give an unreasonable rate for each description.

Description	Verbal Rate	Numerical Rate
Your running rate in a 100-meter dash	Dollars per year	$\frac{m}{sec}$
The fertilization rate for an apple orchard	Inches per year	$\frac{lbs.}{acre}$
The average pay rate for a professional athlete	Meters per second	$\frac{\$}{yr}$
The average rainfall rate in a rain forest	Pounds per acre	$\frac{in}{yr}$

**Example 1:** There are 45 males and 60 females in a subway car.  
The subway car travels 2.5 miles in 5 minutes.

- Find the ratio of males to females. 45:60
- Find the ratio of females to males 60:45
- Find the ratio of females to total passengers. 60:105
- Find the speed of the subway car.  $\frac{2.5 \text{ mi}}{5 \text{ min}} = 0.5 \text{ miles per min.}$

**Example 2:** The ratio table shows the costs for different amounts of artificial turf.  
Find the unit rate in dollars per square foot.

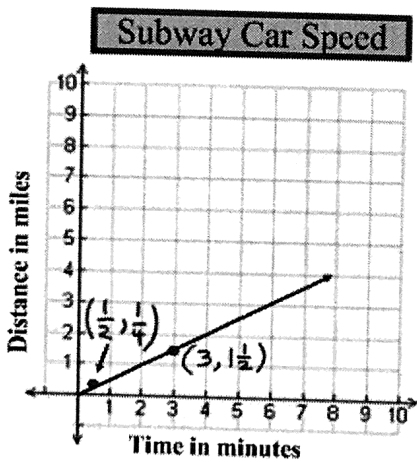
amount(sq ft)	25	100	400	1600
cost (\$)	100	400	1600	6400

You can choose any pair.

$\frac{\$100}{25 \text{ sqft}} = \$4 \text{ per sq. ft}$

**Example 3:**

The graph shows the speed of a subway car. Find the speed in miles per minute.  
Compare the speed to the speed of the subway car from example 1.



You can pick any point if question doesn't specify.

Use the point  $(3, 1\frac{1}{2})$  to find the speed of the subway car.  
~~Does the answer change? Explain.~~

$(3, 1\frac{1}{2})$   
 ↓       ↓  
 min    miles

$\frac{1\frac{1}{2} \text{ mi}}{3 \text{ min}}$

$\frac{1}{2} \div 3$

$\frac{3}{2} \div \frac{3}{1}$

$\frac{1\frac{1}{2}}{2} \cdot \frac{1}{3} = \frac{1}{2} \text{ miles per min.}$