7.1

RATIOS AND PROPORTIONS

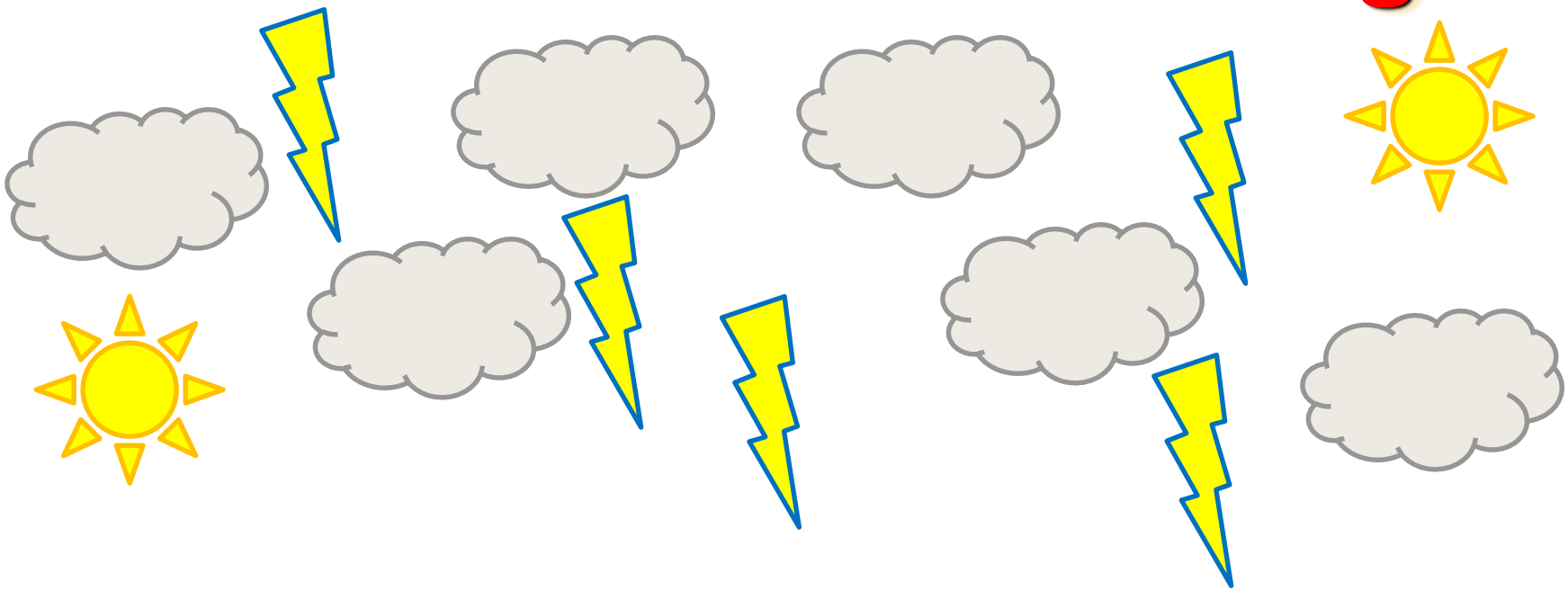
What are ratios?

A ratio is a comparison between two or more things.

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

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

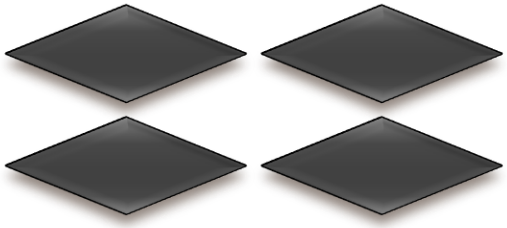
Ratios with more than 2 things

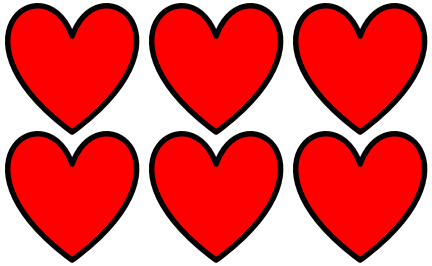


What is the ratio of clouds, lightning bolts, and suns?

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.

Simplifying Ratios

1) $18 : 63$

2) $15x : 45x$

3) $\dfrac{8c^2d}{12cd^2}$

Converting Units Before Simplifying

When you have ratios that can be converted from one to the other…CONVERT AND THEN SIMPLIFY!

4) $2\,\textit{hours} : 10\,\textbf{min}$

5) $8\,\textit{in} : 4\,\textit{ft}$

Making an equivalent ratio

$$\frac{3}{5}$$

Making an equivalent ratio

$$\frac{3x}{5x}$$

Word Problems

6) Jenna plants alfalfa and wheat on 160 acres on her farm. If the ratio of acres of alfalfa to acres of wheat is 3:5, how many acres of each crop are planted?

Word Problems

7) The lengths of the sides of a triangle are in the ratio 3:4:5. The perimeter of the triangle in 24 inches. Find the lengths of each side.

What are Proportions?

Proportions are EQUAL RATIOS

$$\frac{3}{5} = \frac{6}{10}$$

“3 is to 5 as 6 is to 10”

Using Cross Products to Solve Proportions

8) $\frac{x}{25} = \frac{6}{10}$

Using Cross Products to Solve Proportions

9) $\frac{3x+1}{5} = \frac{x}{2}$

Using Cross Products to Solve Proportions

10) $\dfrac{x-5}{12} = \dfrac{x+2}{5}$

Writing Proportions

Example 11

Jim bought 8 tacos for $4. Unfortunately, he was still hungry. So, he bought 6 more tacos. How much did he pay for the 6 tacos?

Writing Proportions

Example 12

A person who weighs 105 pounds on Earth would weigh about 17.5 on the moon. About how much would a 60 pound dog weigh on the moon?

Writing Proportions

Example 13

With a 5 lb bag of flour the cooking class can make 120 muffins. How many muffins can they make with a 2 lb bag of flour?

Properties of Proportions

$$\frac{1}{2} = \frac{2}{4}$$

Properties of Proportions

$$\frac{a}{b} = \frac{c}{d}$$