# Ratios Guide Notes

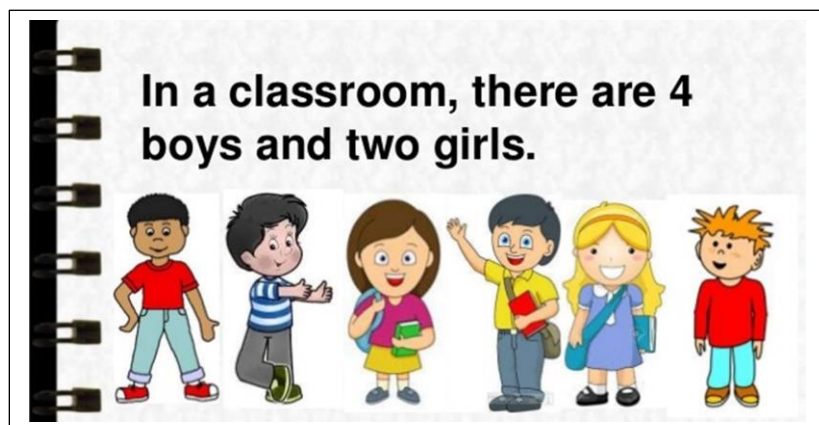## Ratio

**Ratio** is a comparison between, or a relationship of two things.

## Examples:



There is **1** ice cream cone to **3** cookies.



There are **4** boys to **2** girls.

# Ratios Guide Notes

## Ratios can be shown in different ways!

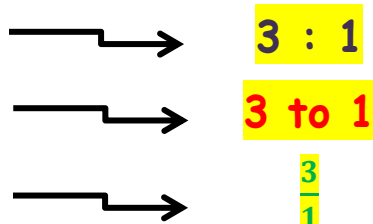There is **1** ice cream cone to **3** cookies.

| | |
|---|---|
| 1. Use the ":" to separate the values (read as **3 is to 1**). | **1:3** |
| 2. We can also use the word "**to**" | **1 to 3** |
| 3. We can write it as a **fraction**. | $\dfrac{1}{3}$ |

## Sample Problem 1:

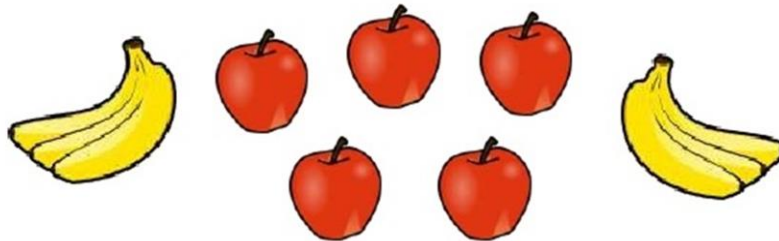**Write in three different ways the ratio of the given figure.**

**3 : 1**

**Solution:**

The ratio of 3 blue rectangles to 1 yellow rectangle.

⟶ 3 : 1

⟶ 3 to 1

⟶ $\dfrac{3}{1}$

# Ratios Guide Notes

## Sample Problem 2:

**Answer the following questions given the picture below.**



a.     What is the ratio of apples to bananas?

**Solution: 5 : 2**

b.     What is the ratio of bananas to apples?
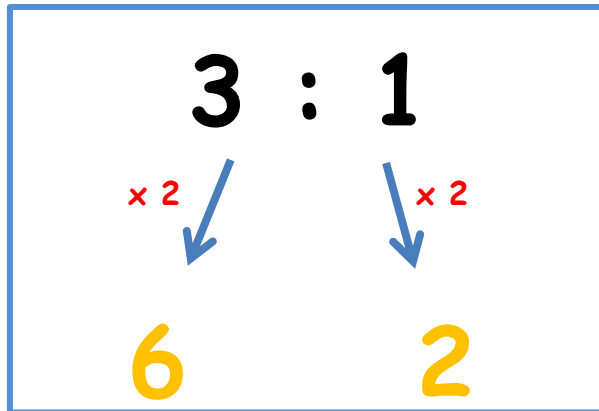
**Solution: 2 : 5**

## Equal Ratios

To find an equal ratio, you can either multiply or divide each term in the ratio by the same number (but not zero).



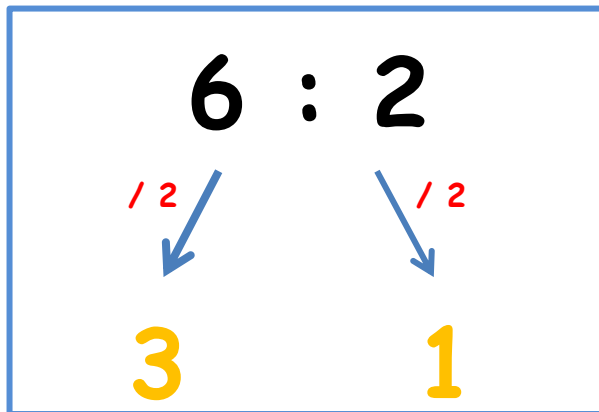Here, the ratio is also 3 blue squares to 1 yellow square, even though there are more squares.

# Ratios Guide Notes

$$3 : 1$$

× 2 ↓    ↓ × 2

$$6 \quad 2$$

Or it could be the other way around...

$$6 : 2$$

/ 2 ↓    ↓ / 2

$$3 \quad 1$$

Therefore, $3 : 1 = 6 : 2$

# Ratios Guide Notes

## How do we know that the RATIOS are EQUAL?

**Example:** Are the ratios 4 : 1 and 12 : 3 equal?

**Step 1:** Find the quotient of the numbers in the ratio.

$$4 \div 1 = 4 \qquad\qquad 12 \div 3 = 4$$

**Step 2:** If the quotients are the **SAME**, then ratios are **EQUAL**!

$$4 : 1 = 12 : 3$$

## Sample Problem 3:

**Are the ratios 3 : 4 and 12 : 16 EQUAL or NOT?**

**Solution:**

3 ÷ 4 = 0.75

12 ÷ 16 = 0.75

Therefore, 3 : 4 = 12 : 16

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# Ratios Guide Notes

## Reducing Ratios

Reducing ratios is similar to reducing a fraction in lowest terms since ratios can be expressed as fractions.

**Example:**

Reduce 12:16 in lowest terms.

Step 1: Find the GCF of the numbers in the ratio.

   GCF is 4

Step 2: Divide the numbers in the ratio by the GCF.

$$\frac{12}{4} : \frac{16}{4} \longrightarrow 3 : 4$$

**IMPORTANT:** Ratios are in lowest terms if and only if, the Greatest Common Factor left is 1.

## Sample Problem 4:

**Reduce 16 : 24 in lowest term.**

Solution:

GCF is 8 $\longrightarrow$ $\frac{16}{8} : \frac{24}{8}$ $\longrightarrow$ 2 : 3

# Ratios Guide Notes

## Sample Problem 5:

**Who wants some yummy pancake?**

A recipe for pancakes uses 3 cups of flour and 2 cups of milk. To make pancakes for a LOT of people we might need 4 times the quantity.

a. What is the ratio of flour to milk in the original recipe?
   **Solution: 3 : 2**

b. What is the ratio of flour to milk in the NEW recipe?
   Solution:

   3 x 4 : 2 x 4 = **12 : 8**

   12 cups of flour to 8 cups of milk for a yummy pancake

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