


Ordering fractions

Which is bigger? (=, > or <)

$$\frac{2}{3} \quad \square \quad \frac{5}{6} = \frac{\quad}{6} \quad \square \quad \frac{5}{6}$$


We will give both fractions the same denominator - a common denominator.

When we do this, we are not changing the size of the fraction, we are finding an *equivalent* fraction.

In this example, the best way to give both fractions a common denominator is to change the thirds into sixths.

So we do the same to the numerator.

$$\frac{2}{3} \times \square = \frac{5}{6} = \frac{4}{6} \times \square = \frac{5}{6}$$

We multiplied the denominator by 2

So we do the same to the numerator.

The diagram illustrates the process of comparing two fractions. It starts with the fraction $\frac{2}{3}$ on the left. A blue curved arrow labeled "x2" points from the numerator 2 to the numerator 4 of the fraction $\frac{4}{6}$. Another blue curved arrow labeled "x2" points from the denominator 3 to the denominator 6 of the same fraction. The fraction $\frac{4}{6}$ is shown with the numbers 4 and 6 in red. To the right of $\frac{4}{6}$ is a square box containing a less-than sign (<), followed by the fraction $\frac{5}{6}$. An equals sign (=) is placed between $\frac{4}{6}$ and the comparison box. The entire sequence is: $\frac{2}{3}$ < $\frac{5}{6}$ = $\frac{4}{6}$ < $\frac{5}{6}$.

We multiplied the denominator by 2

Now we can order the fractions.

What if we can't find a common denominator by doubling?

$$\frac{3}{8} \quad \square \quad \frac{4}{10} = \frac{\quad}{40} \quad \square \quad \frac{\quad}{40}$$

To find a **common denominator** of 8 and 10

We find a **multiple** of 8 and 10.

Can you think of one?

So we do the same to the numerator.

Now we find our numerators.

$$\frac{3}{8} \times \frac{4}{10} = \frac{15}{40}$$

The diagram illustrates the process of finding an equivalent fraction. It shows the fraction $\frac{3}{8}$ multiplied by $\frac{4}{10}$. A blue arrow labeled "x5" points from the denominator 8 to 40. Another blue arrow labeled "x5" points from the numerator 3 to 15. The resulting fraction $\frac{15}{40}$ is shown in red. A box is present between the fractions, and another box is present between the equals sign and the final fraction.

We multiplied 8 by 5 to get 40.

Now find the other numerator.

$$\frac{3}{8} \quad \boxed{<} \quad \frac{4}{10} = \frac{15}{40} \quad \boxed{<} \quad \frac{16}{40}$$

We multiplied 10 by what to get 40?

So we multiply the other numerator by 4

Try these.

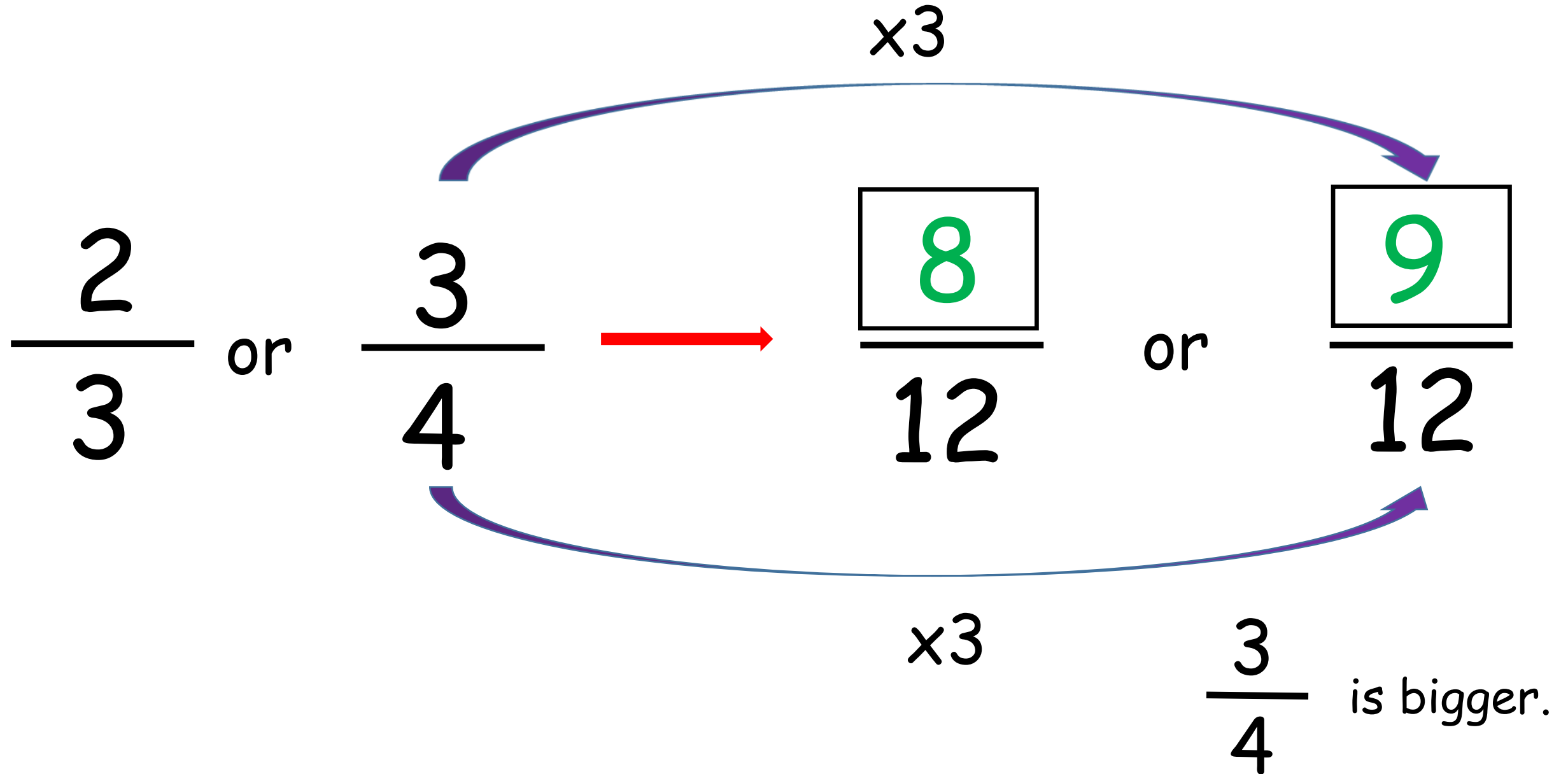
Change the numerator to find the larger fraction.

The diagram illustrates the process of comparing two fractions by finding a common denominator. It shows the fraction $\frac{1}{2}$ on the left, followed by the word "or", then the fraction $\frac{3}{8}$. A red arrow points from $\frac{3}{8}$ to a new fraction $\frac{4}{8}$, where the numerator "4" is enclosed in a black box. To the right of $\frac{4}{8}$ is the word "or", followed by the fraction $\frac{3}{8}$. Two purple curved arrows, both labeled "x4", indicate the multiplication of the numerator and denominator of $\frac{1}{2}$ to reach $\frac{4}{8}$. One arrow starts at $\frac{1}{2}$ and points to the boxed "4" in $\frac{4}{8}$. The other arrow starts at $\frac{3}{8}$ and points to the "8" in $\frac{4}{8}$.

$$\frac{1}{2} \text{ or } \frac{3}{8} \longrightarrow \frac{\boxed{4}}{8} \text{ or } \frac{3}{8}$$

$\frac{1}{2}$ is bigger.

Change the numerator to find the larger fraction.



Change the numerator to find the larger fraction.

$$\frac{3}{5} \text{ or } \frac{7}{10} \longrightarrow \frac{\boxed{6}}{10} \text{ or } \frac{7}{10}$$

$\frac{7}{10}$ is bigger.

Change the numerator to find the larger fraction.

$$\frac{5}{6}$$

or

$$\frac{2}{3}$$



$$\frac{5}{6}$$

or

$$\frac{\boxed{4}}{6}$$

$$\frac{5}{6}$$

is bigger.

$$\frac{5}{8} \quad \boxed{>} \quad \frac{1}{2}$$

Hint: change the half into eighths

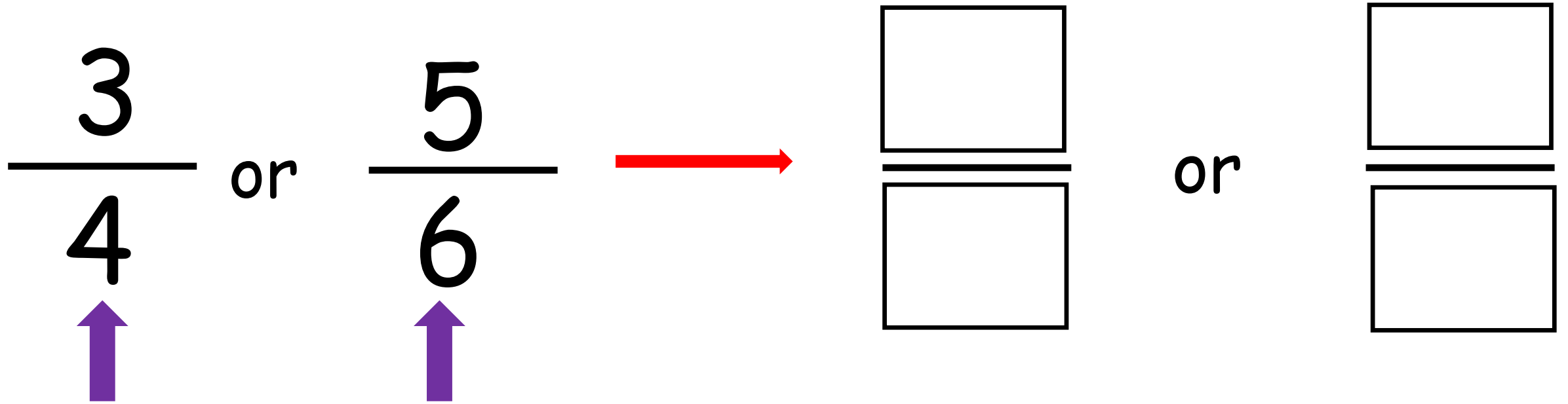
$$\frac{2}{4} = \frac{1}{2}$$

Hint: change the half into quarters

$$\frac{3}{5} \quad \boxed{>} \quad \frac{1}{2}$$

Hint: change BOTH fractions into tenths

The next step is to make equivalent fractions by finding our own numerators and denominators.



Find a common denominator.

(A number that is a multiple of 4 and 6)

What could it be?

$$\frac{3}{4}$$

or

$$\frac{5}{6}$$



$$\frac{\square}{12}$$

or

$$\frac{\square}{12}$$

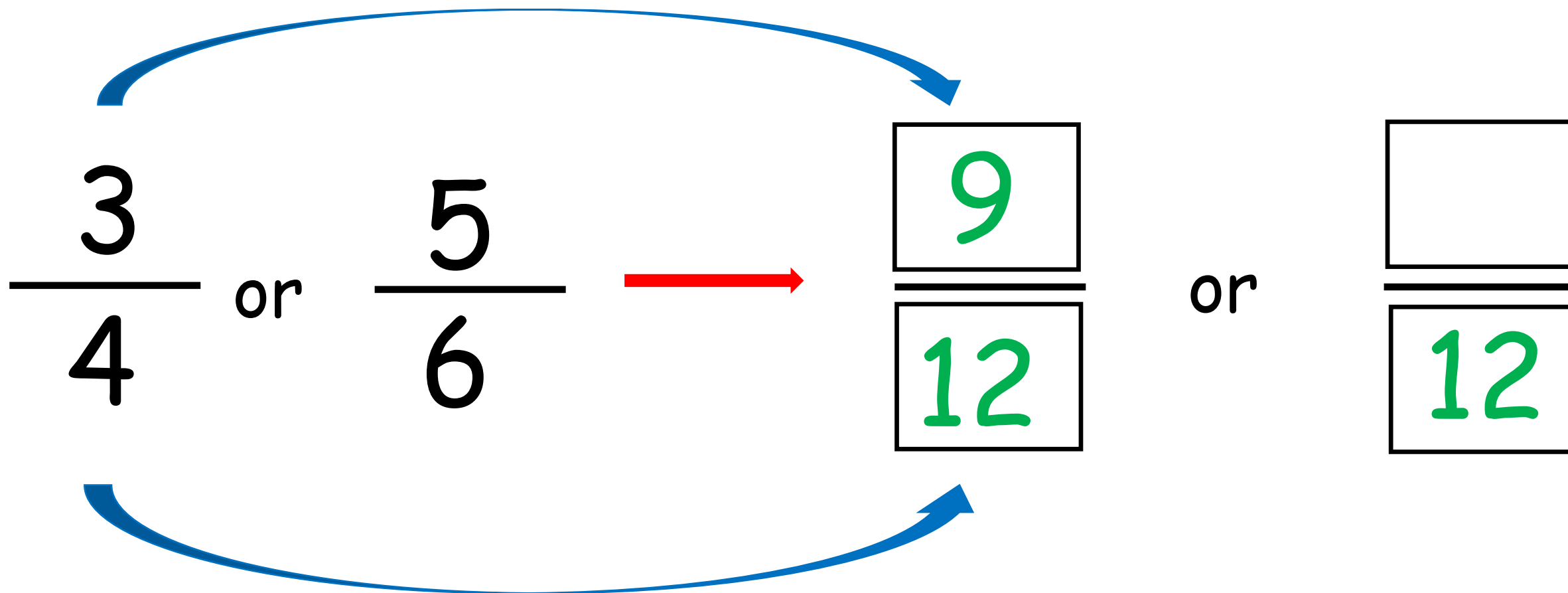


Now we are going to make equivalent fractions by multiplying the numerators by the same amount that we multiplied the denominators.

$$\frac{3}{4} \text{ or } \frac{5}{6} \xrightarrow{\text{red arrow}} \frac{\boxed{}}{\boxed{12}} \text{ or } \frac{\boxed{}}{\boxed{12}}$$

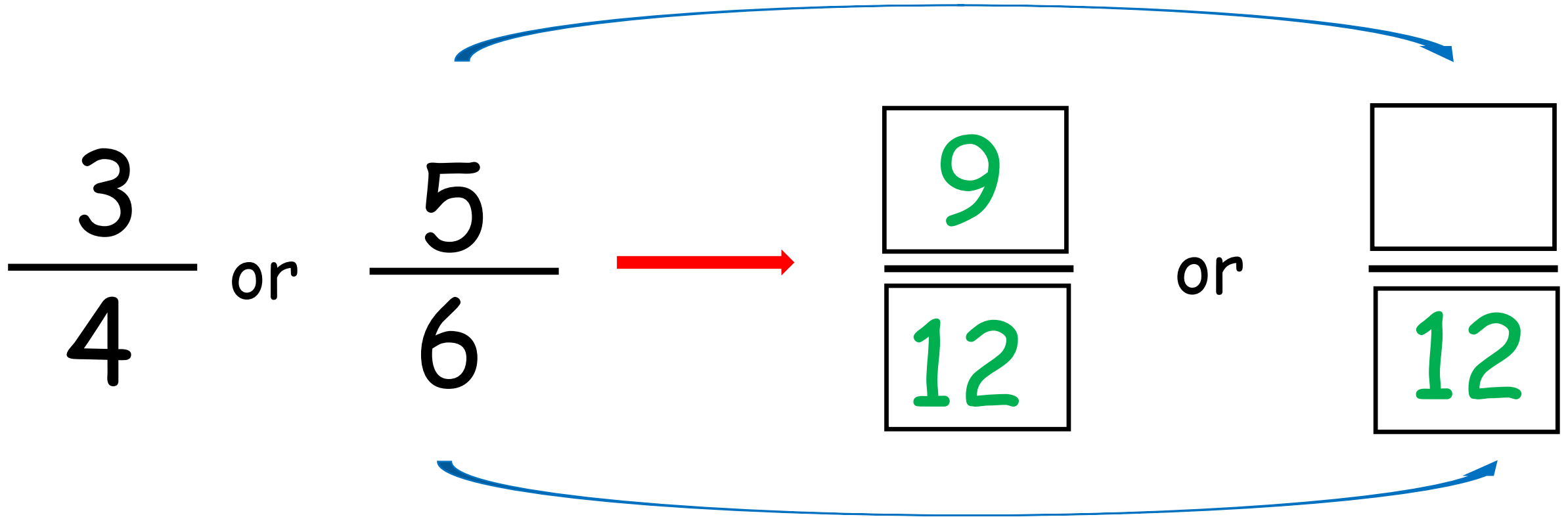
This will give us two fractions that have the same denominators but are the same size as the ones we started with.

So we multiply the numerator by 3.



This denominator has been multiplied by 3.

Now we find the numerator of the other fraction the same way.



The denominator was multiplied by what? $\times 2$

So we multiply the numerator by 2

$$\frac{3}{4} \text{ or } \frac{5}{6} \xrightarrow{\quad} \frac{\boxed{9}}{\boxed{12}} \text{ or } \frac{\boxed{10}}{\boxed{12}}$$


$\times 2$

The denominator was multiplied by what?

$$\frac{3}{4} < \frac{5}{6} \longrightarrow \frac{\boxed{9}}{\boxed{12}} \text{ or } \frac{\boxed{10}}{\boxed{12}}$$

Now we can compare the fractions.

Which is larger?

$$\frac{4}{10} \text{ or } \frac{5}{12} \longrightarrow \frac{\boxed{24}}{60} \text{ or } \frac{\boxed{25}}{60}$$


This one is larger.


Which is larger?

$$\frac{5}{8} \text{ or } \frac{7}{12} \longrightarrow \frac{\boxed{30}}{48} \text{ or } \frac{\boxed{28}}{48}$$




This one is larger.

Which is larger?

$$\frac{2}{6} \text{ or } \frac{3}{8} \longrightarrow \frac{\boxed{8}}{24} \text{ or } \frac{\boxed{9}}{24}$$


This one is larger.

Which is larger?

$$\frac{3}{5} \text{ or } \frac{4}{6} \longrightarrow \frac{\boxed{18}}{\boxed{30}} \text{ or } \frac{\boxed{20}}{\boxed{30}}$$


This one is larger.

Which is larger?

$$\frac{1}{4}$$

or

$$\frac{2}{7}$$



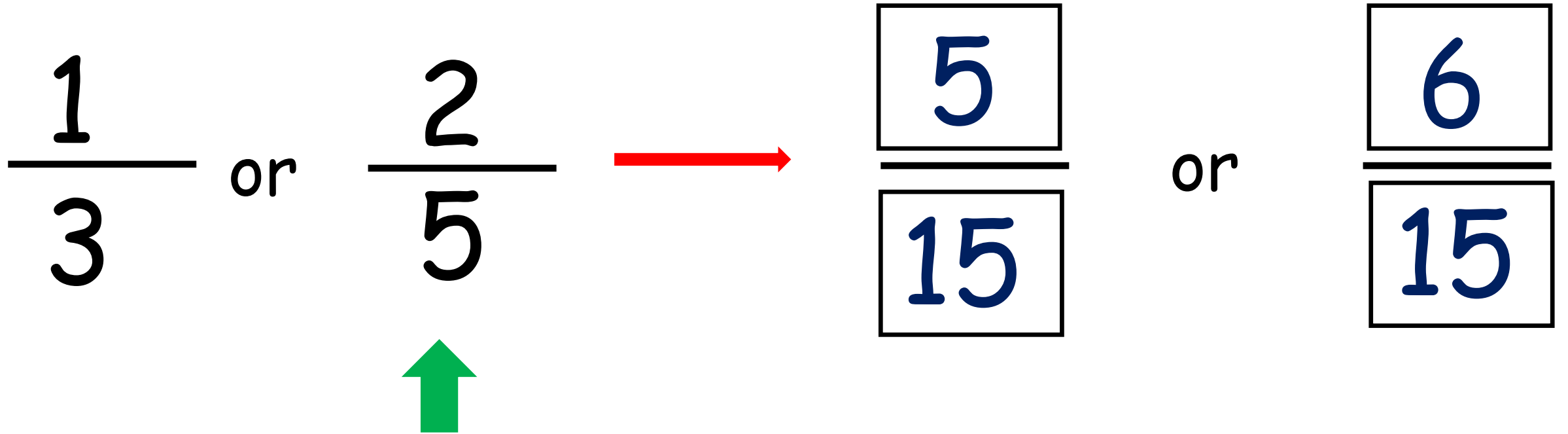
$$\frac{7}{28}$$

or

$$\frac{8}{28}$$

This one is larger.

Which is larger?

$$\frac{1}{3} \text{ or } \frac{2}{5} \longrightarrow \frac{\boxed{5}}{\boxed{15}} \text{ or } \frac{\boxed{6}}{\boxed{15}}$$


This one is larger.

Which is larger?

$$\frac{2}{6}$$

or

$$\frac{3}{8}$$



$$\frac{8}{24}$$

or

$$\frac{9}{24}$$



This one is larger.

Which is larger?

$$\frac{2}{3}$$

or

$$\frac{3}{7}$$



$$\frac{14}{21}$$

or

$$\frac{9}{21}$$



This one is larger.

Which is larger?

$$\frac{2}{5}$$

or

$$\frac{3}{8}$$



$$\frac{16}{40}$$

or

$$\frac{15}{40}$$



This one is larger.