Ordering fractions

Which is bigger?   (=, > or <)

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

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.

x2

$$\frac{2}{3} \quad \boxed{} \quad \frac{5}{6} \quad = \quad \frac{\color{red}{4}}{\color{red}{6}} \quad \boxed{} \quad \frac{5}{6}$$

x2

We multiplied the denominator by 2

So we do the same to the numerator.

x2

$$\frac{2}{3} \boxed{<} \frac{5}{6} = \frac{\color{red}{4}}{\color{red}{6}} \boxed{<} \frac{5}{6}$$

x2

We multiplied the denominator by 2   Now we can order the fractions.

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

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

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.

x5

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

x5

We multiplied 8 by 5 to get 40.

Now find the other numerator.

×4

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

×4

We multiplied 10 by what to get 40?   So we multiply the other numerator by 4
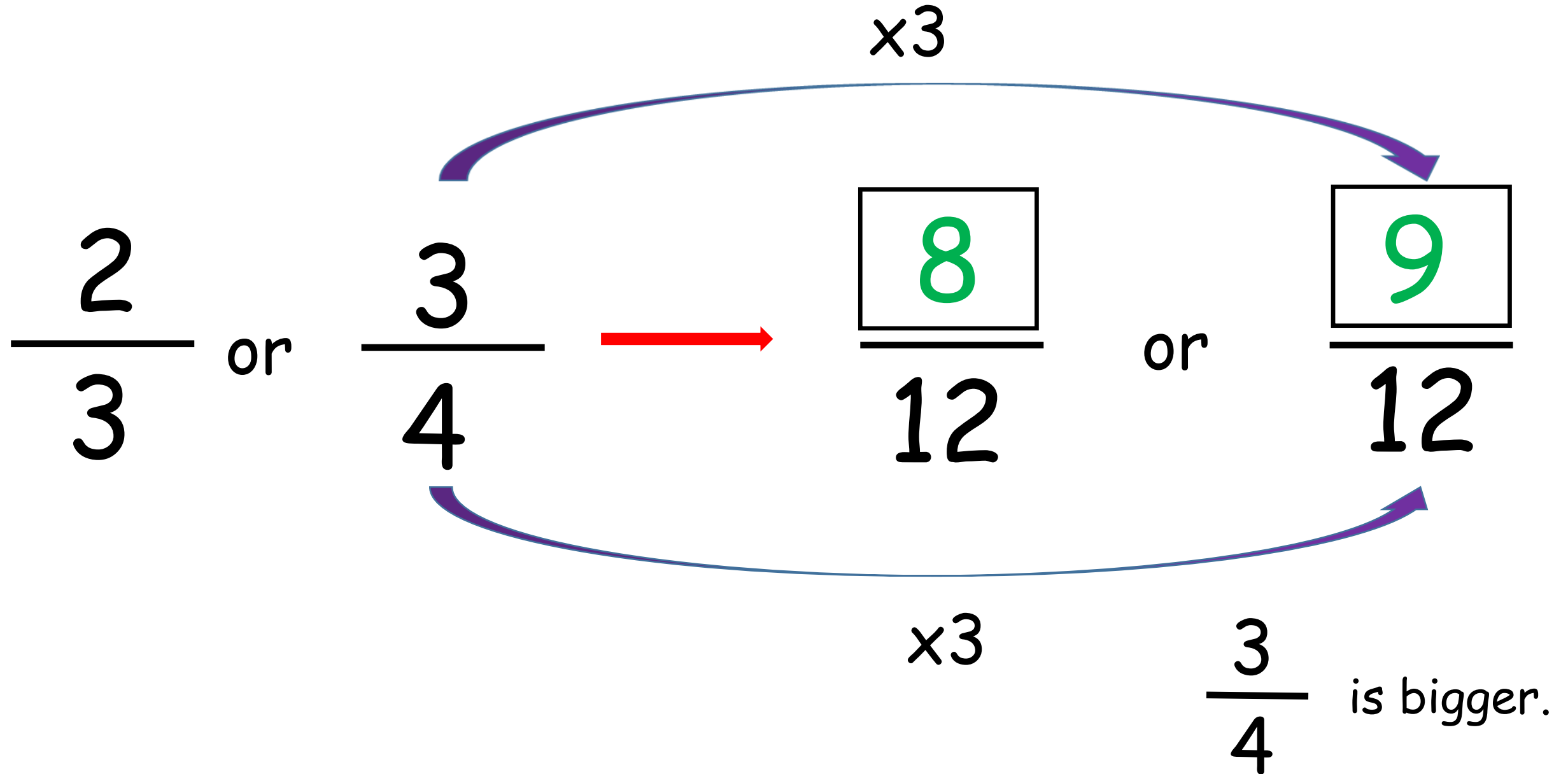
Try these.

Change the numerator to find the larger fraction.

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

×4

×4

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

Change the numerator to find the larger fraction.

×3

$$\frac{2}{3}$$ or $$\frac{3}{4}$$ → $$\frac{8}{12}$$ or $$\frac{9}{12}$$

×3

$$\frac{3}{4}$$ is bigger.

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.

$$\frac{5}{6} \quad \text{or} \quad \frac{2}{3} \quad \longrightarrow \quad \frac{5}{6} \quad \text{or} \quad \boxed{\frac{4}{6}}$$

$$\frac{5}{6} \quad \text{is bigger.}$$

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

Hint: change the half into eighths

$$\frac{2}{4} \boxed{=} \frac{1}{2}$$
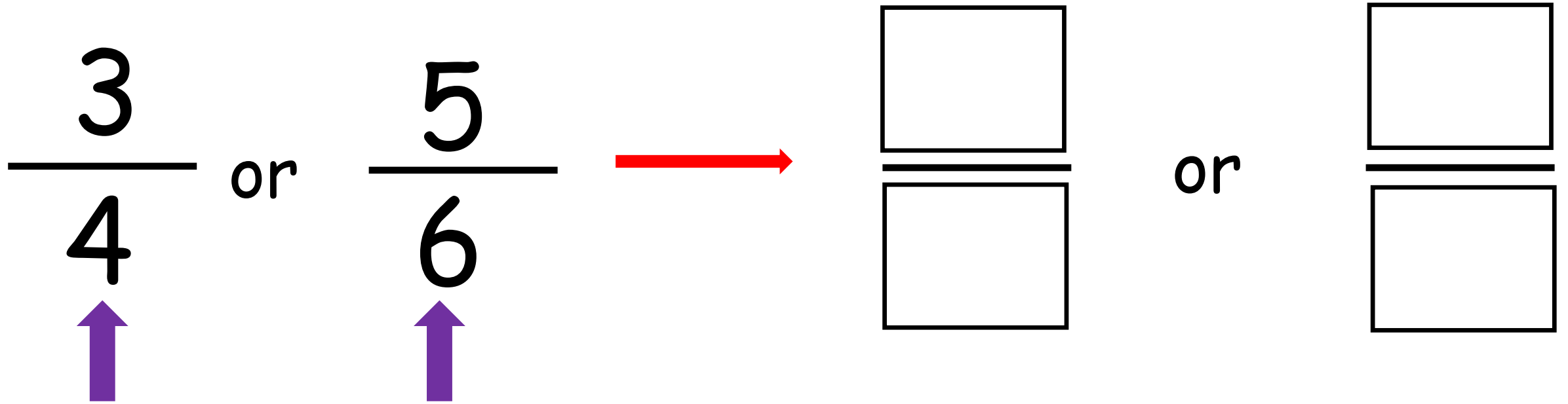
Hint: change the half into quarters

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

Hint: change BOTH fractions into tenths

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

$$\frac{3}{4} \quad \text{or} \quad \frac{5}{6}$$

Find a common denominator.

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

What could it be?

$$\frac{3}{4}$$ or $$\frac{5}{6}$$ →

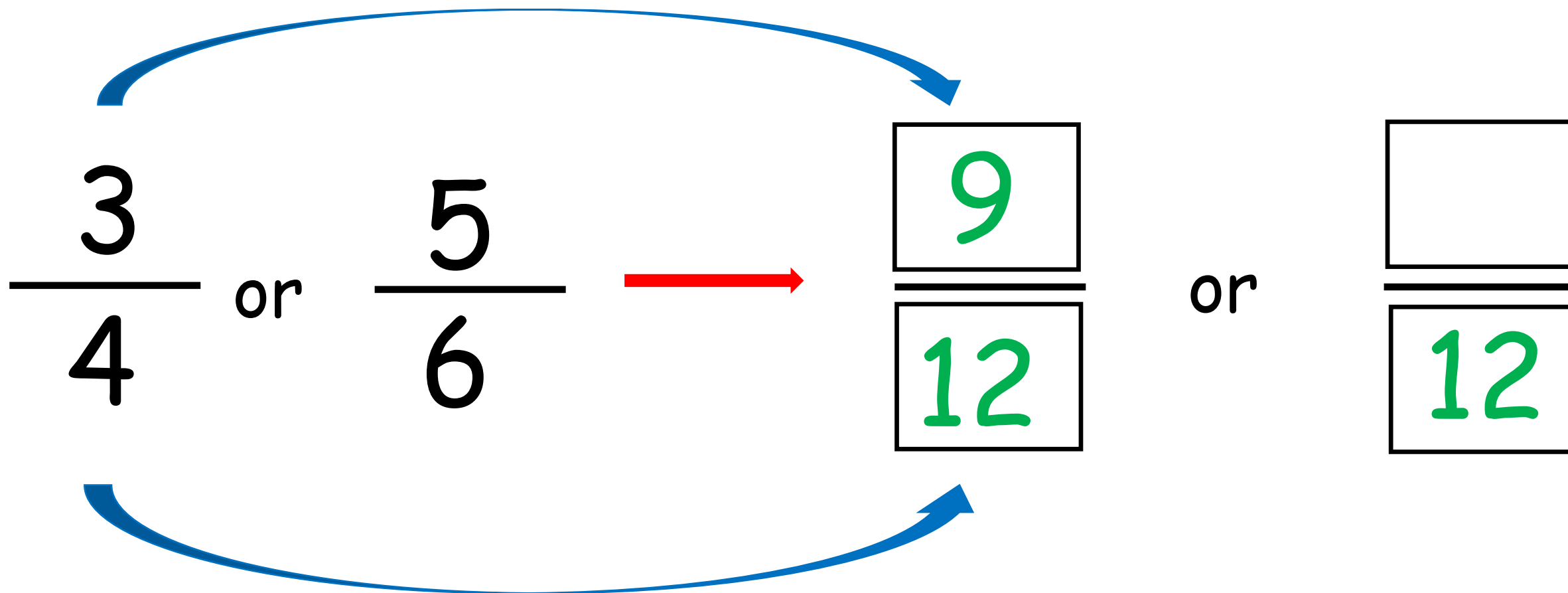$$\frac{\boxed{}}{\boxed{12}}$$ or $$\frac{\boxed{}}{\boxed{12}}$$

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

$$\frac{3}{4} \quad \text{or} \quad \frac{5}{6} \quad \longrightarrow \quad \frac{\square}{12} \quad \text{or} \quad \frac{\square}{12}$$
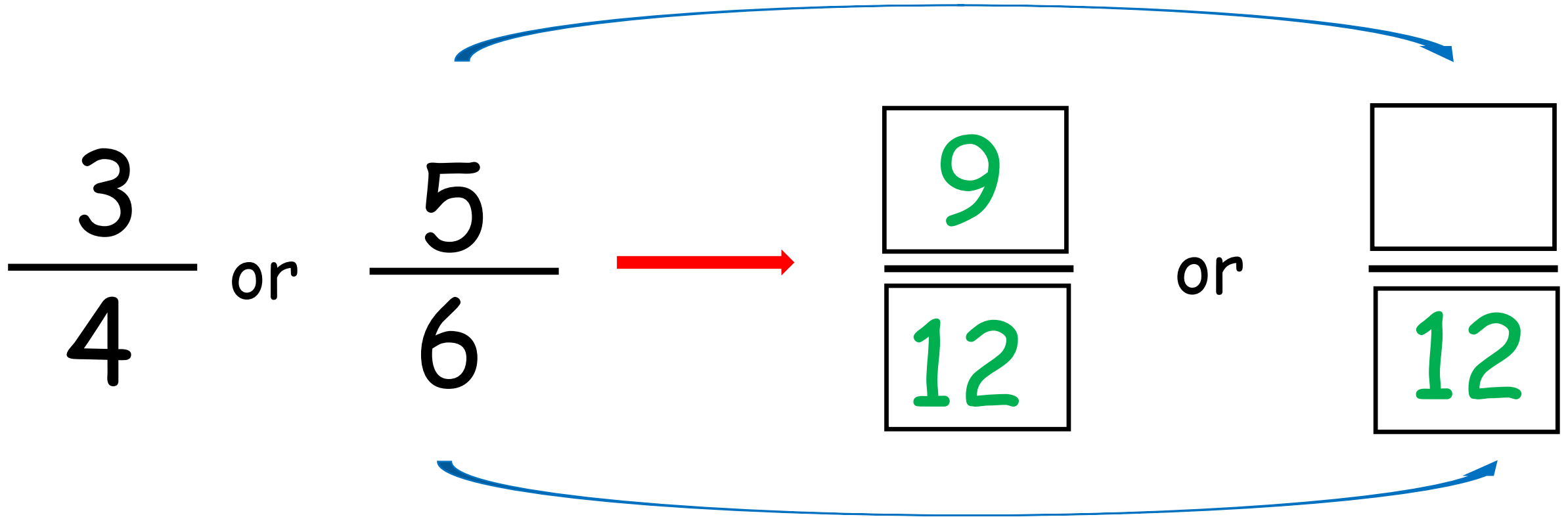
This will give us two fractions that have the same denominators but are the same size as the ones we started with.

So we multiply the numerator by 3.

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

This denominator has been multiplied by 3.

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

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

The denominator was multiplied by what? x2

So we multiply the numerator by 2

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

x2

The denominator was multiplied by what?

$$\frac{3}{4} < \frac{5}{6}$$

→

$$\frac{9}{12}$$ or $$\frac{10}{12}$$

Now we can compare the fractions.

Which is larger?

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

This one is larger.

Which is larger?

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

This one is larger.

Which is larger?

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

This one is larger.

Which is larger?

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

This one is larger.

Which is larger?

$$\frac{1}{4} \quad \text{or} \quad \frac{2}{7} \quad \longrightarrow \quad \frac{7}{28} \quad \text{or} \quad \frac{8}{28}$$

This one is larger.

Which is larger?

$$\frac{1}{3}$$ or $$\frac{2}{5}$$ → $$\frac{5}{15}$$ or $$\frac{6}{15}$$

This one is larger.

Which is larger?

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

This one is larger.

Which is larger?
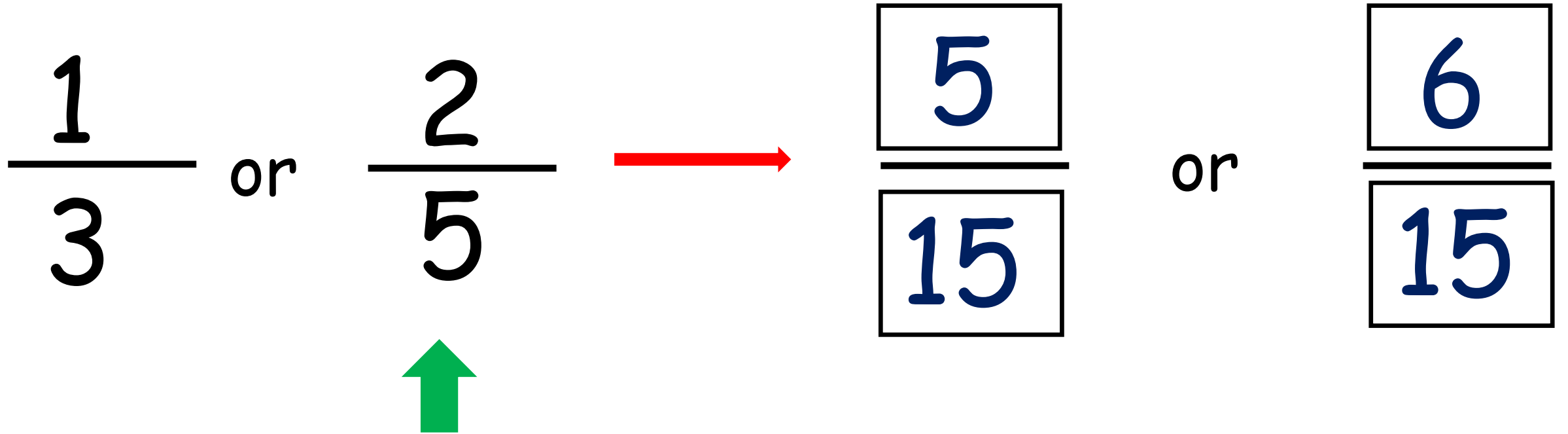
$$\frac{2}{3}$$ or $$\frac{3}{7}$$ → $$\frac{\boxed{14}}{\boxed{21}}$$ or $$\frac{\boxed{9}}{\boxed{21}}$$

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.