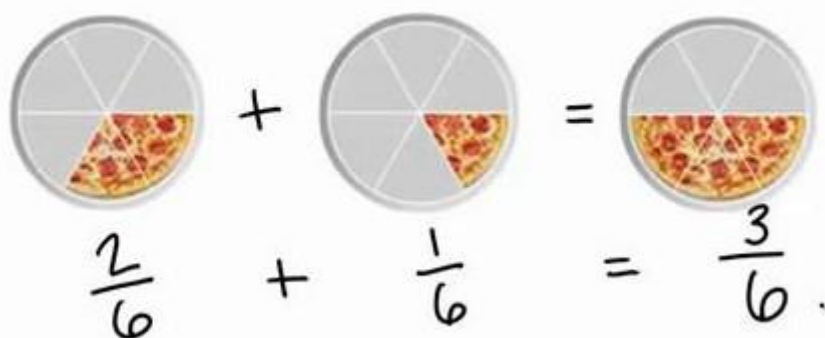


Calculating with Fractions

Adding fractions with the same denominator:



$$\frac{3}{7} + \frac{2}{7} = ?$$

$$\frac{3}{7} + \frac{2}{7} = \frac{3+2}{7} = \frac{5}{7}$$

Same

Adding fractions with different denominators:

1. Find the lowest common denominator.
2. Convert them to fractions with the same denominator.
3. Add the numerators.

Add $\frac{2}{3}$ **and** $\frac{4}{6}$

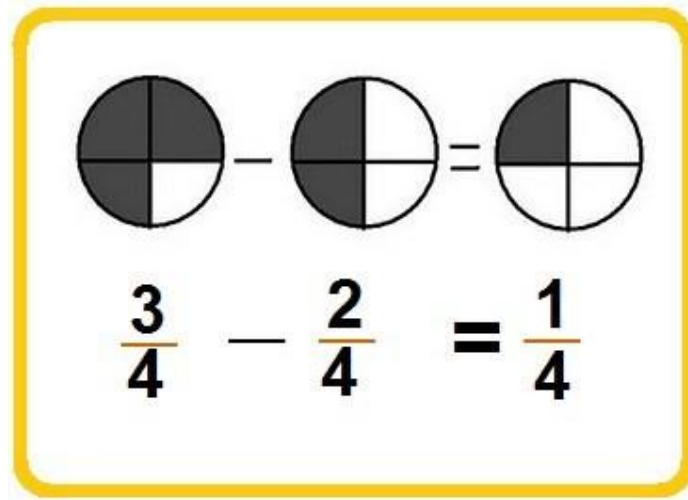
LCM (3,6) = 6

$$\frac{2}{3} + \frac{4}{6} = \frac{4+4}{6} = \frac{8}{6} = \frac{4 \times 2}{3 \times 2} = \frac{4}{3}$$

$$\frac{2}{3} + \frac{4}{6} = \frac{4}{3}$$

Calculating with Fractions

Subtracting fractions with the same denominator:



Subtracting fractions with different denominators:

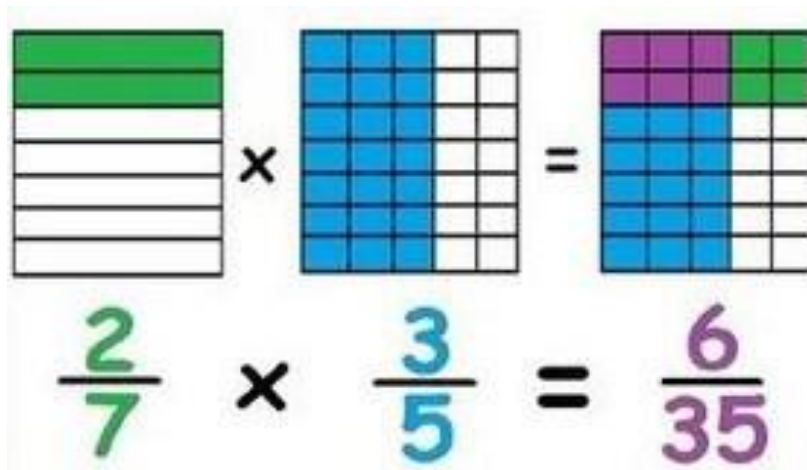
1. Find the lowest common denominator.
2. Convert them to fractions with the same denominator.
3. Subtract the numerators.

$$\begin{aligned}\frac{3}{4} - \frac{1}{3} &= \frac{3 \times 3}{4 \times 3} - \frac{1 \times 4}{3 \times 4} \\ &= \frac{9}{12} - \frac{4}{12} \\ &= \frac{5}{12}\end{aligned}$$

Calculating with Fractions

Multiplying fractions:

Multiply the numerators and denominators. Simplify.



$$\frac{2}{5} \times \frac{6}{7} = \frac{2 \times 6}{5 \times 7} = \frac{12}{35}$$

$$\frac{1}{4} \times \frac{2}{3} = \frac{1 \times 2}{4 \times 3} = \frac{2}{12} = \text{reduces to } \frac{1}{6}$$

Multiplying a whole number by a fraction:

1. Keep the fraction the same.

$$\frac{4}{5} \times 7 = ?$$

2. Put the whole number over one.

$$\text{Since } 7 = \frac{7}{1}$$

3. Multiply across.

$$\frac{4}{5} \times \frac{7}{1} = \frac{28}{5}$$

Dividing with fractions:

Dividing a whole number by a fraction – visual explanation

$$3 \div \frac{1}{4} =$$

3 tells us how many whole sets we start with.



The $\frac{1}{4}$ tells us how many parts we have to divide the wholes



Now we know how many parts are in the wholes. There are 12.

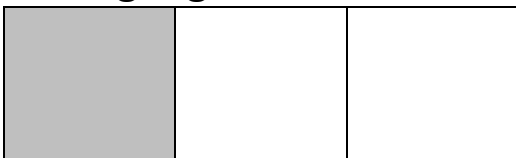
$$3 \div \frac{1}{4} = 12$$

Dividing a fraction by a whole number:

$$\frac{1}{3} \div 4 =$$

The $\frac{1}{3}$ tells us how many parts the whole needs to be split in to.

We highlight 1 column for $\frac{1}{3}$



The 4 tells us to split the whole in to 4 equal rows.



Here we can see that each of the four rows has 1 cell shaded and that the whole now has 12 parts. So the answer is $\frac{1}{12}$.

Division with Fractions

Once the children have a secure understanding of the visual model we can introduce them to an alternative method.

Dividing with Whole Numbers:

$$\frac{9}{17} \div 3 = \frac{9}{17} \div \frac{3}{1}$$

1. Keep the first fraction the same and put the whole number over one.

$$\frac{9}{17} \times \frac{1}{3} = \frac{9 \times 1}{17 \times 3}$$

2. Flip the new fraction upside down and multiply.

3. Reduce the answer to its lowest form

$$= \frac{9}{51} = \frac{9 \div 3}{51 \div 3} = \frac{3}{17}$$

Dividing Fractions with Fractions

1.

Invert the fraction that you are dividing by

$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$

2.

Multiply the numerators and denominators

$$\frac{4}{5} \times \frac{3}{2} = \frac{12}{10}$$

3.

Simplify the fraction if necessary

$$\frac{12}{10} = 1\frac{1}{5}$$