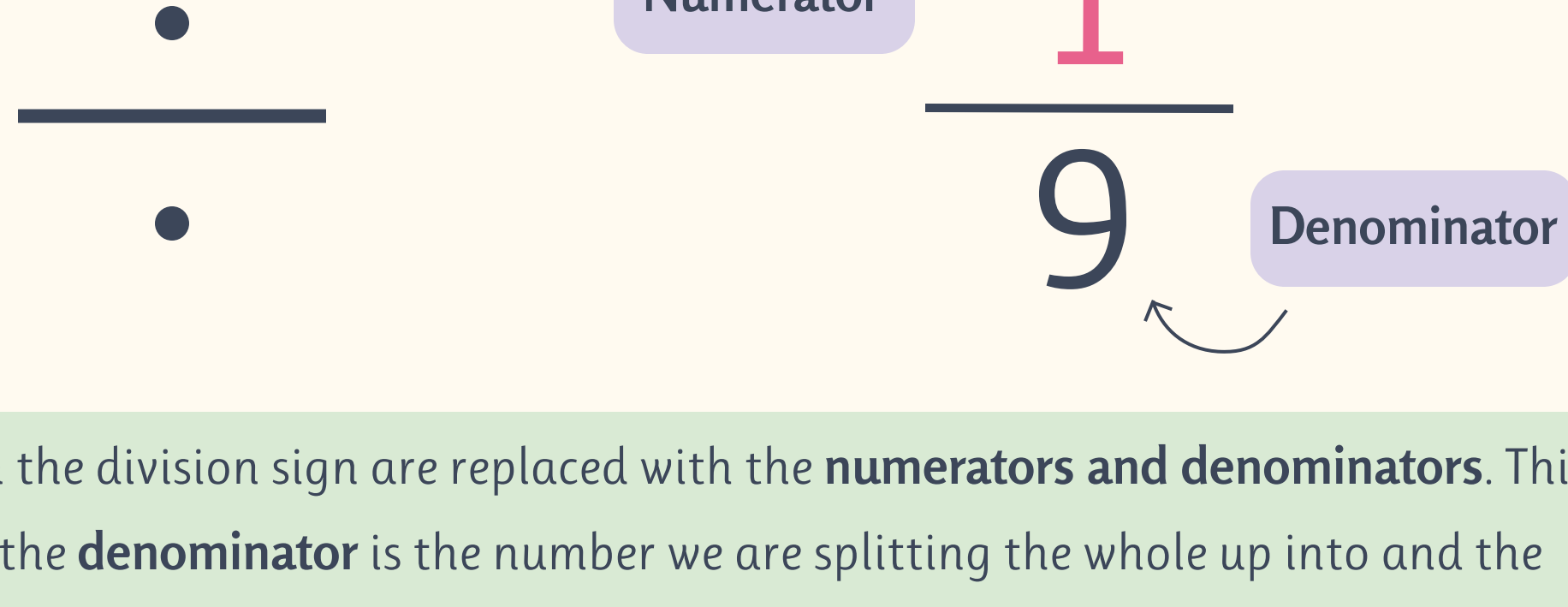


What do you need to know?

Fractions are portions of a whole. However, we can also understand them as **division questions!** Don't believe me? Look for the division sign \div in a fraction!

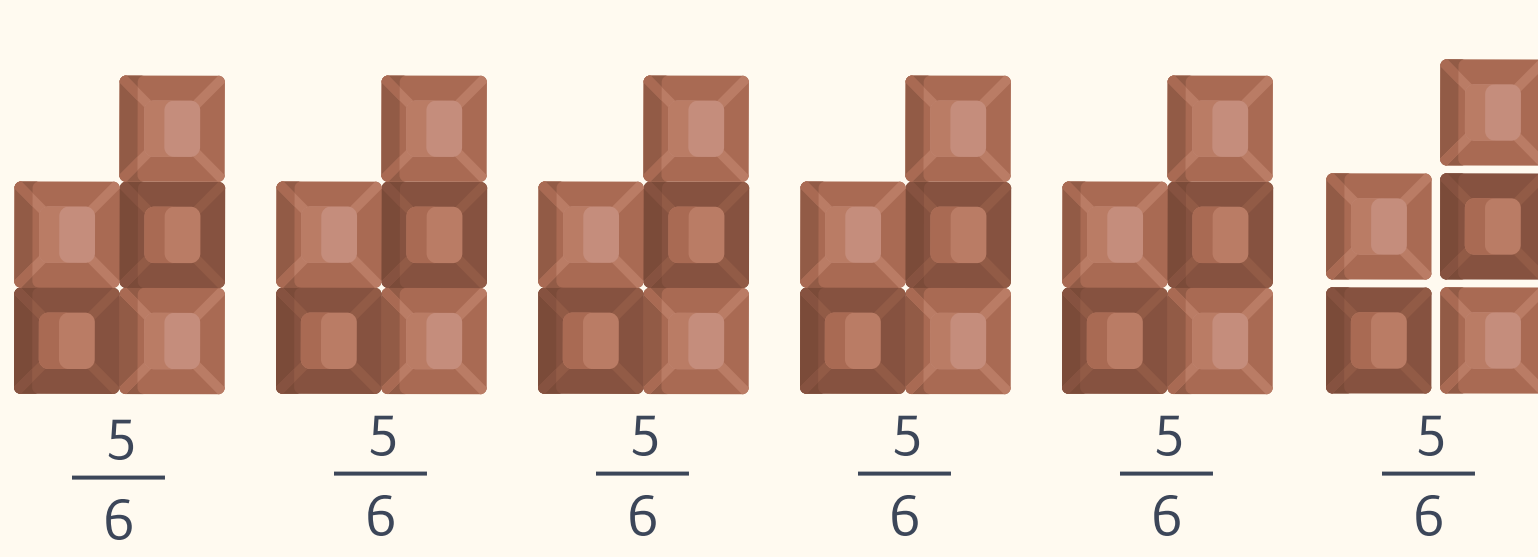


The dots in the division sign are replaced with the **numerators and denominators**. This is because the **denominator** is the number we are splitting the whole up into and the **numerator** is the amount that we have!

For example: If I have 5 chocolate bars but 6 people wanting some I would have to divide 5 by 6 to know how much chocolate each person gets. As a number sentence this is:

$$\text{Chocolate per person} = 5 \div 6$$

On the other hand, I could just split the 5 chocolate bars into equal sixths and each person would get $\frac{5}{6}$ of a chocolate bar.



$$\text{Chocolate per person} = \frac{5}{6}$$

1 whole chocolate bar is the same as $\frac{6}{6}$. Fractions with the same numerator and denominator are always equal to **one whole!** In the diagram, $\frac{5}{6}$ of each bar have been given to 5 people, and the last $\frac{1}{6}$ of each bar would total another $\frac{5}{6}$, giving the 6th person their chocolate!

The shared chocolate is the same, so

$$5 \div 6 = \frac{5}{6}$$

A **unit fraction** is a fraction where the numerator is **one**. A **non-unit fraction** is a fraction with a number other than one as its numerator.

How we find a fraction of an integer depends on whether we are finding a unit or a non-unit fraction:

Unit fractions:

If we are asked to find a unit fraction of an integer, we can simply **divide** the integer by the **denominator** of our unit fraction!

E.g. What is $\frac{1}{3}$ of 30?

Since $\frac{1}{3}$ is a unit fraction, we just need to divide 30 by our denominator, 3!

$$30 \div 3 = 10$$

Therefore $\frac{1}{3}$ of 30 is 10! ✓

Non-unit fractions:

If we are asked to find a non-unit fraction of an integer we just need to **divide** the integer by the **denominator**, and then **multiply** the integer by the **numerator!**

E.g. What is $\frac{3}{4}$ of 40?

Since $\frac{3}{4}$ is a non-unit fraction we need to first divide 40 by the denominator, 4:

$$40 \div 4 = 10$$

This gives us $\frac{1}{4}$ of 40, so next we need to multiply this by the numerator, 3:

$$10 \times 3 = 30$$

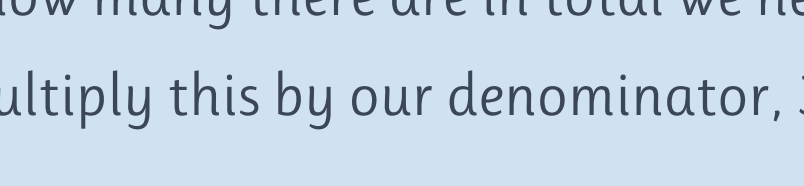
Therefore $\frac{3}{4}$ of 40 is 30! ✓

But, what if we are asked the opposite? What if we **know what the fraction of a total is** but we **need to know the total**? This also depends on what kind of fraction we are given!

Unit fractions:

If we are asked to find a total, given unit fraction, we just need to multiply that integer by the denominator of our unit fraction!

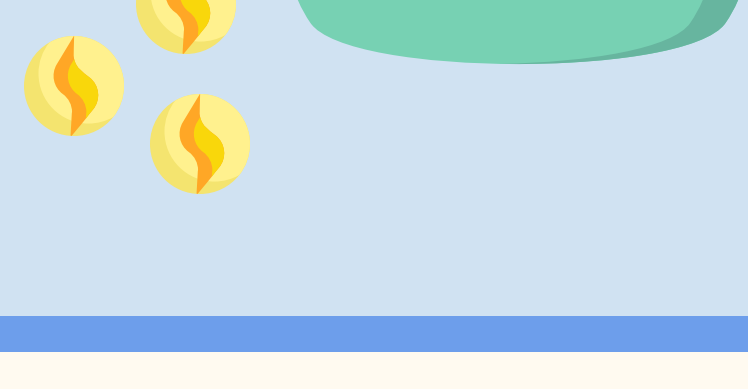
E.g. In a bag of marbles $\frac{1}{3}$ of the marbles are yellow. Bob counts out that there are 13 yellow marbles. How many marbles are there in the bag altogether?



We know that $\frac{1}{3} = 13$ marbles. To find out how many there are in total we need to multiply this by our denominator, 3:

$$13 \times 3 = 39$$

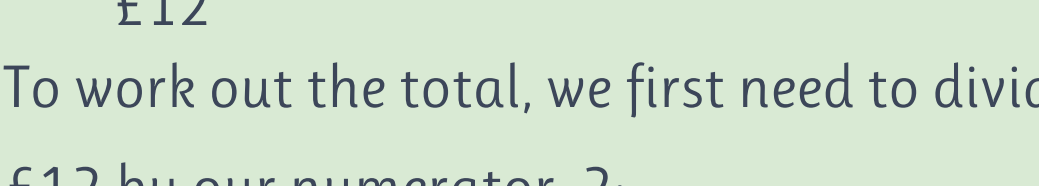
Therefore we know that in total there are 39 marbles in the bag!



Non-unit fractions:

If we are asked to find a total, given a non-unit fraction, we just need to multiply that integer by the denominator of our unit fraction, and then divide that by the numerator.

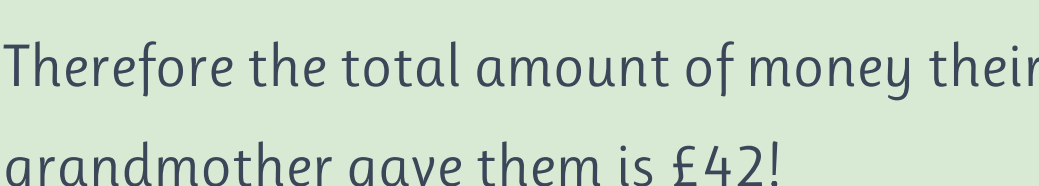
E.g. Two children get some money from their grandmother. Nafisa gets $\frac{2}{7}$ of the money and Hifza gets the rest. If Nafisa's amount was £12, how much money did the grandmother give them altogether?



To work out the total, we first need to divide £12 by our numerator, 2:

$$12 \div 2 = 6$$

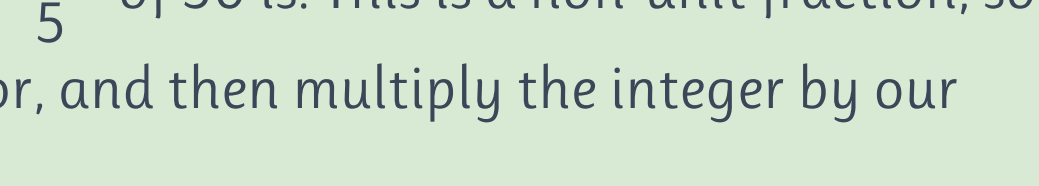
This gives us the amount of money in $\frac{1}{7}$.



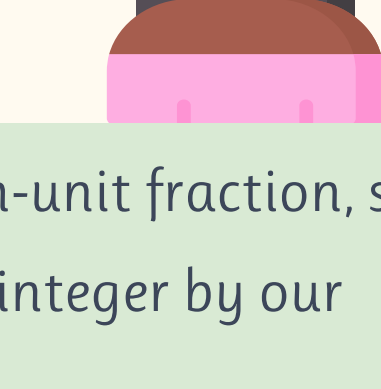
We can now multiply this amount by our denominator, 7, to get the total amount:

$$6 \times 7 = 42$$

Therefore the total amount of money their grandmother gave them is £42!



Let's take a look at an example:



Sumaya buys $\frac{4}{5}$ of the 30 cupcakes in a shop. How many cupcakes does she buy in total?

This question is asking us to calculate what $\frac{4}{5}$ of 30 is. This is a non-unit fraction, so we just need to divide 30 by our denominator, and then multiply the integer by our numerator!

Our denominator is 5, so first we need to divide 30 by 5:

$$30 \div 5 = 6$$

This shows us that $\frac{1}{5}$ of 30 is 6.



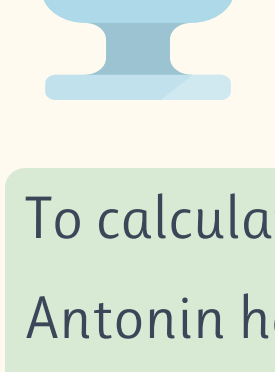
Next, we need to multiply 6 by our numerator, 4:

$$6 \times 4 = 24$$

Therefore Sumaya bought 24 cupcakes in total! ✓



How about something slightly harder?



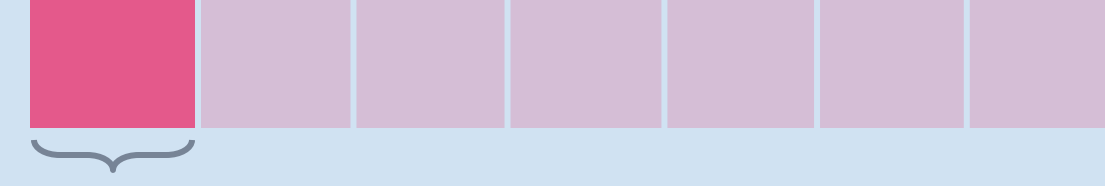
Antonin and Iris are sharing a raspberry smoothie. Iris was very thirsty and drank $\frac{5}{7}$ of the smoothie. Antonin drank 200 ml. If there is no smoothie left, how much was there in the glass originally?

To calculate the total amount of smoothie in the glass we need to know what fraction Antonin had! There is no smoothie left at the end, so to find out how much Antonin had we can take away how much Iris drank from 1 whole, which we can write as $\frac{7}{7}$.

$$\frac{7}{7} - \frac{5}{7} = \frac{2}{7}$$

So we know Antonin had $\frac{2}{7}$ of the smoothie.

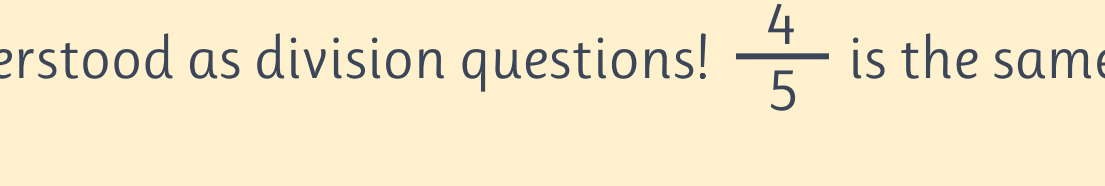
We know that Antonin drank 200ml of the smoothie, so this means that 200ml corresponds to $\frac{2}{7}$ of the smoothie!



To calculate the total we first need to divide 200ml by our numerator, 2, to find out how much $\frac{1}{7}$ of the glass corresponds to.

$$200 \div 2 = 100$$

Therefore $\frac{1}{7}$ of the smoothie is equal to 100ml!



Now we can multiply this amount by our denominator, 7, to get the total amount of smoothie!

$$100 \times 7 = 700$$

Therefore the glass had 700ml of smoothie originally! ✓



Remember!

- ★ Fractions can be understood as division questions! $\frac{4}{5}$ is the same thing as dividing 4 by 5.
- ★ When we calculate the fraction of a number, we are just dividing by the denominator and multiplying by the numerator!
- ★ When we are given what the fraction of a total is, and we are asked for the total we need to reverse this process! We divide the number by the numerator and multiply by the denominator.
- ★ Don't just memorize these steps, try to reason what you are doing with each calculation!