

Dividing Fractions: How It Works

In grade 5, one number is a whole number and the other is a unit fraction: a fraction with 1 on top.

1. How many pieces fit? A whole number ÷ a unit fraction



1 whole



1 whole

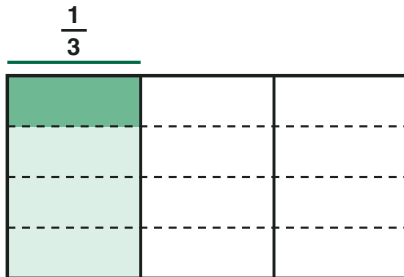


1 whole

$$3 \div \frac{1}{5} = 15$$

$3 \div \frac{1}{5}$ asks: **how many fifths are in 3?** Each whole has 5 fifths, so 3 wholes have $3 \times 5 = 15$ fifths. Count them in the picture.

2. Share one piece: a unit fraction ÷ a whole number



The dark piece is one share.

$\frac{1}{3} \div 4$ asks: if $\frac{1}{3}$ is shared equally among 4, how big is each share?

Cut the third into 4 equal pieces. Cut the other thirds the same way. Now the whole has $3 \times 4 = 12$ equal pieces.

One share is 1 of those 12 pieces, so $\frac{1}{3} \div 4 = \frac{1}{12}$

3. The rules

Whole number ÷ unit fraction

Multiply the whole number by the **bottom number**.

$$3 \div \frac{1}{5} = 3 \times 5 = 15$$

Unit fraction ÷ whole number

Multiply the **bottom number** by the whole number. The top stays 1.

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

Check with multiplication

Multiplying undoes dividing. Multiply your answer by the number you divided by. You should get back the number you started with.

$$3 \div \frac{1}{5} = 15 \text{ because } 15 \times \frac{1}{5} = \frac{15}{5} = 3$$

$$\frac{1}{3} \div 4 = \frac{1}{12} \text{ because } \frac{1}{12} \times 4 = \frac{4}{12} = \frac{1}{3}$$

Watch out

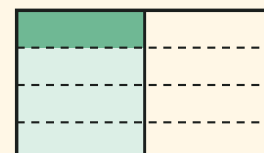
The two kinds are not the same. $4 \div \frac{1}{2} = 8$, but $\frac{1}{2} \div 4 = \frac{1}{8}$.

Ask yourself: am I counting how many pieces fit, or sharing one piece?

Dividing does not always make a number smaller. $4 \div \frac{1}{2}$ is 8, which is more than 4, because many small pieces fit in 4.



$$4 \div \frac{1}{2} = 8$$



$$\frac{1}{2} \div 4 = \frac{1}{8}$$