



Topic: Multiplication and Division of Fractions

Year: 8

NC Strand: Number

What should I already know?

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| <ul style="list-style-type: none"> Represent tenths and hundredths on diagrams and number lines Interchange between fractions, decimals and percentages for multiples of one Equivalent fractions Converting between any fractions, decimals and percentages Convert mixed numbers and improper fractions Adding and subtracting fractions and decimals with <ul style="list-style-type: none"> The same denominator | <ul style="list-style-type: none"> One denominator a multiple of another Different denominators Add and subtract decimals and fractions Use and interpret algebraic notation Understand and use inverse operations Understand equivalence of algebraic expressions |
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What will I know by the end of the unit?

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| <ul style="list-style-type: none"> How to represent multiplication of fractions in different ways How to multiply a fraction by an integer How to find the product of a pair of unit fractions How to find the product of any pair of fractions How to divide an integer by a fraction | <ul style="list-style-type: none"> How to divide a fraction by a unit fraction How to find the reciprocal of a fraction and a decimal and use this to answer division questions How to divide a pair of fractions How to multiply and divide improper and mixed fractions How to multiply and divide algebraic fractions |
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Vocabulary

Unit fraction	a fraction with a numerator of 1.	Divide	is sharing or grouping a number into equal parts.
Numerator	number above the line of a fraction, showing the number of parts of the whole.	Reciprocal	also called the multiplicative inverse. One of two numbers whose product is 1, $n \times 1/n = 1$. to get the reciprocal of a number, divide 1 by the number.
Denominator	the bottom number in a fraction showing the number of parts the whole is divided into.	Simplify	To simplify a fraction to its simplest form
		Factors	a whole number that divides exactly into another number.
Product	the result when two numbers are multiplied.	Generalise	make a general statement by inferring from specific cases
Repeated addition	the process of repeatedly adding the same number.	Expression	an expression is one or a group of terms and may include variables, constants, operators and grouping symbols.
Square	a number that results from multiplying an integer by itself.	Cancel	reducing a fraction to an equivalent fraction with the lowest possible numbers in both the numerator and denominator. This is achieved by dividing both the top and bottom of the fraction by the same number.
Whole	a counting number from zero to infinity, no fractions, decimal fractions or negative numbers	Simplest form (Fractions)	to reduce the numerator and denominator in a fraction to the smallest numbers possible
Commutative	in addition and multiplication, numbers may be added or multiplied together in any order.	Term	one of the numbers in a ratio, e.g. 1:2:3



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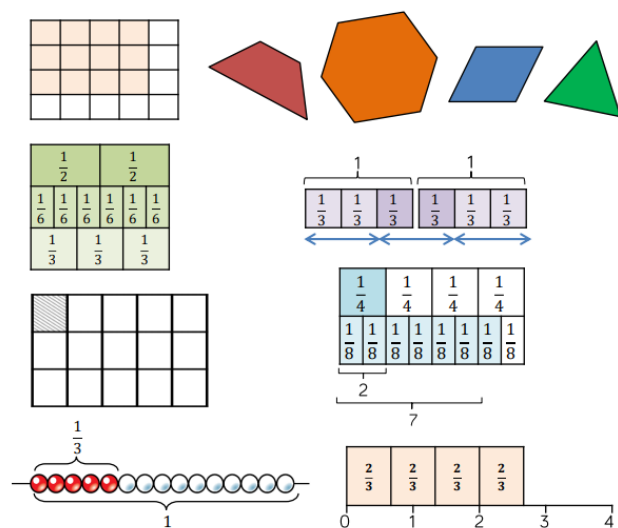
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Estimate	to make an approximate calculation, often based on rounding	Quotient	the number resulting from dividing one number by another, the answer.
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Diagram/Key Information

Key Representations



Dividing Fractions

$$\frac{2}{5} \div \frac{2}{3} \rightarrow \frac{2}{5} \times \frac{3}{2}$$

Invert the numerator and denominator to make the problem a multiplication problem.

Multiply the numerators. Multiply the denominators.

$$\frac{2}{5} \times \frac{3}{2} = \frac{6}{10}$$

Simplify the fraction by dividing the numerator and denominator by the lowest common factor

$$\frac{6}{10} = \frac{3}{5}$$

Multiplying Fractions

$$\frac{2}{4} \times \frac{3}{6}$$

$$\frac{2}{4} \times \frac{3}{6} = \frac{6}{24}$$

Multiply the numerators. Multiply the denominators.

$$\frac{6}{24} = \frac{1}{4}$$

Simplify the fraction by dividing the numerator and denominator by their largest common factor.

Investigate/Homework tasks

- Homework will be set from the booklet issued by your teacher
- You should complete at least 30 minutes of maths tasks on Maths Whizz (not games). Please attend help sessions if you do not have access to the internet at home
- Additional work you could complete:
 - Find out more about the meaning of the vocabulary list using <http://www.amathsdictionaryforkids.com/>
- To challenge yourself:
 - Investigate the key questions typed in red text
 - Explain the key questions typed in purple text
 - Challenge yourself by answering the key questions in green

Key skills/Timeline/Topic Questions

- When making a representation of a fraction why is it important that each part is equal?
- How is addition related to multiplication?
- How is finding the fraction of an amount the same as multiplying a fraction?
- Does multiplying by a fraction always give a result which is less than 1?
- Does multiplying always make numbers larger?
- Why will the product of two unit fractions always have one as a numerator?
- When we divide the quotient is always smaller than the dividend. True or false?
- How would you find the reciprocal of a decimal?
- Can we find the reciprocal of zero?
- What do you notice about $\frac{1}{5} \times 5$? Try multiplying another number by it's reciprocal. Is this true for all numbers?
- Why is a common denominator useful when dividing fractions?
- Can there be a remainder when dividing by fractions?

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| <ul style="list-style-type: none">• How can multiplying by a fraction be expressed as a multiplication and a division?• Is it always, sometimes, or never appropriate to convert fractions to decimals before multiplying?• How many unit fractions make a whole?• Shade in three quarters of a square. Count the number of quarters. How does this show $\frac{3}{4} \div \frac{1}{4}$? | <ul style="list-style-type: none">• Count up in thirds starting from 0. Did you count up in mixed numbers or improper fractions?• Is it easier to multiply and divide fractions as improper or mixed?• How many different ways can you write a quarter of x?• Can you have an improper algebraic fraction?• Can we use repeated addition for multiplying algebraic fractions? |
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