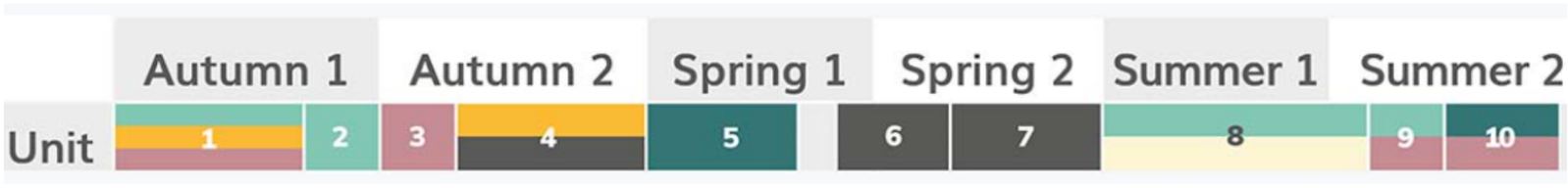
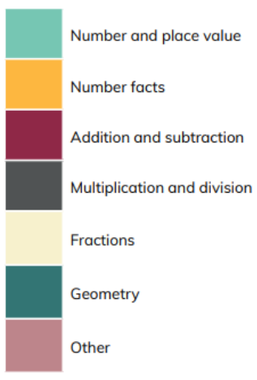
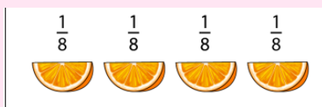
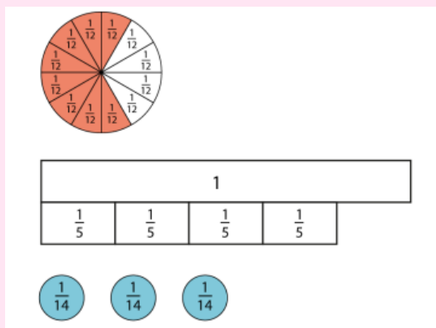
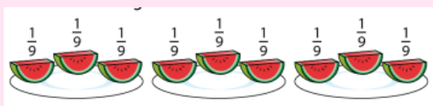
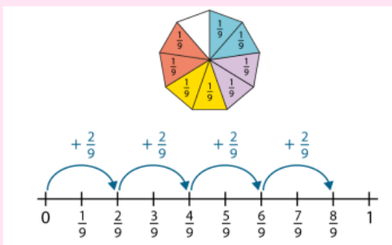
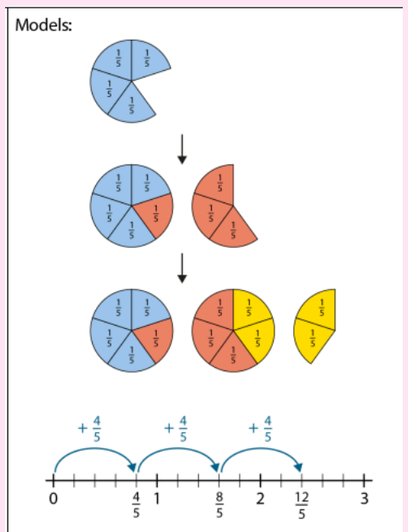
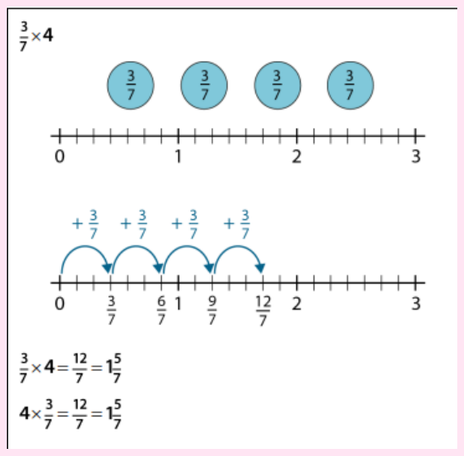
Y5- Overview

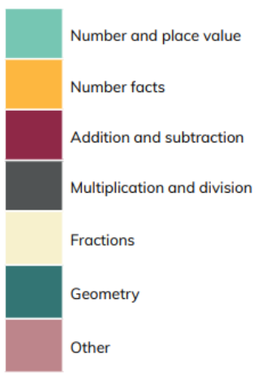




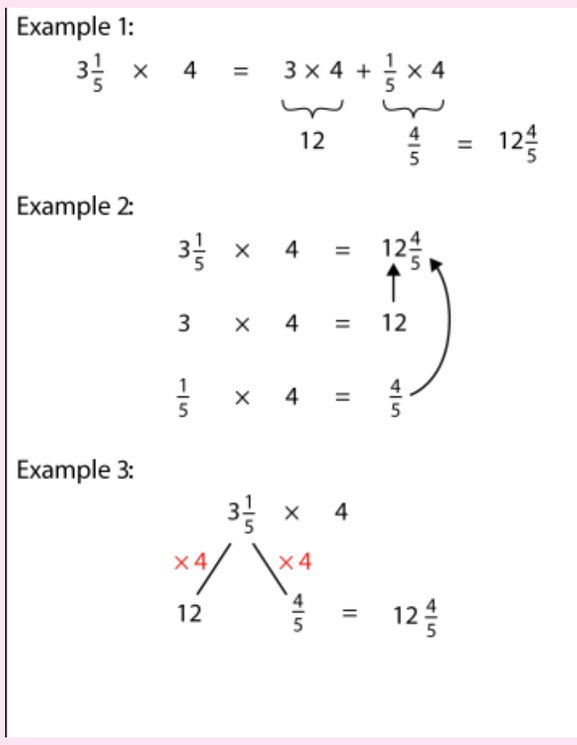
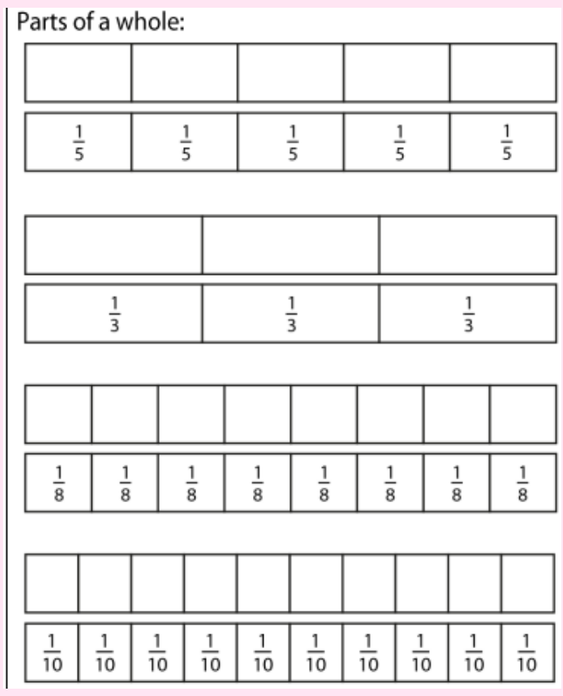
Spring 2	Multiply a proper fraction by a whole number (1 week)
Ready to progress	F-1 Find non-unit fractions of quantities. 5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. 5F-3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions.
NCETM documents	TEACHING POINT 1 https://www.ncetm.org.uk/media/cupjlpd1/ncetm_spine3_segment06_y4.pdf#page=5
Small steps	• To explain the relationship between repeated addition of unit fractions and multiplication of fractions. • To explain the relationship between repeated addition of fractions and multiplication of fractions. • To multiply a proper fraction by a whole number where the product is within a whole. • To multiply a proper fraction by a whole number where the product is greater than a whole. • To solve problems involving multiplying proper fractions by whole numbers.
Links	NCETM To page 32-https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2F5rqnojoj%2Fcp-year-5-unit-8-fractions.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/multiply-a-proper-fraction-by-a-whole-number/lessons?sid-d06d6b=dY0CqNQ-od&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y5%20Autumn%20Block%204%20SOL%20Fractions%20A.pdf Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf
Reasoning	Spot the Mistake 0.088, 0.089, 1.0 What is wrong with this sequence? Think about what comes directly after 0.089 when counting in thousandths. What Comes Next? 1.173, 1.183, 1.193 What number comes next in this pattern? What is increasing each time? Explain how you know. What Do You Notice? What is one tenth of £41? What is one hundredth of £41? What is one thousandth of £41? Use these amounts to explain the relationship between division and multiplying a unit fraction by a whole number. Continue the Pattern 0.085 + 0.015 = 0.1 0.075 + 0.025 = 0.1 0.065 + 0.035 = 0.1 Continue this pattern with the next five number sentences. What do you notice about the pairs of numbers? Missing Symbol Put the correct symbol < or > in each box: 4.627 ___ 4.06 12.317 ___ 12.31 Explain how you decided which symbol to use by comparing the value of each digit. Do, Then Explain Circle each decimal which, when rounded to one decimal place, is 6.2: 6.32, 6.23, 6.27, 6.17 Explain how rounding works in these examples and why you chose your answers. Top Tips How do you round decimal numbers to one decimal place? Write a tip or method you can use to help remember how rounding decimals works. Odd One Out Which is the odd one out in each of these collections of four fractions? 6/10, 3/5, 18/20, 9/15 30/100, 3/10, 6/20, 3/9

	Multiply a proper fraction by a whole number (1 week)
Problem solving	Click on me
Glossary	• Repeated addition - Repeated addition is the process of adding the same equal group to itself multiple times. • Unit fraction - A unit fraction is a fraction where the numerator is 1 • Represent - To represent something is to show it in a different way. • Unitise - Unitising means treating groups that contain or represent the same number of things as units or ones. • Non-unit fraction - A non-unit fraction is a fraction where the numerator is greater than 1 • Numerator - A denominator is the bottom number in a fraction. It shows how many parts a whole has been divided into. • Denominator - A numerator is the top number in a fraction. It shows how many parts we have. • Unitise - Unitising means treating groups that contain or represent the same number of things as units or ones. • Proper fraction - A proper fraction is a fraction where the numerator is less than the denominator. • Improper fraction - An improper fraction is a fraction where the numerator is greater than the denominator.
Stem sentences	The whole has been divided into _____ equal parts, and _____ of these parts _____. _____ lot(s) of _____ is equal to _____. The numerator of the fraction is multiplied by the whole number and the denominator remains the same.
Representations	 $2+2+2+2$ 4×2 2×4 $2+2+2+2=4\times2=2\times4$  $4\times\frac{1}{8}$ $\frac{1}{8}\times4$ $\frac{1}{8}+\frac{1}{8}+\frac{1}{8}+\frac{1}{8}=4\times\frac{1}{8}=\frac{1}{8}\times4$   • $\frac{3}{9}+\frac{3}{9}+\frac{3}{9}$ • $3\times\frac{3}{9}$ • $\frac{3}{9}\times3$  $\frac{2}{9}+\frac{2}{9}+\frac{2}{9}+\frac{2}{9}=\frac{8}{9}$ $4\times\frac{2}{9}=\frac{8}{9}$ $\frac{2}{9}\times4=\frac{8}{9}$ Models:  Commutativity: $3\times\frac{4}{5}=\frac{12}{5}=2\frac{2}{5}$ $\frac{4}{5}\times3=\frac{12}{5}=2\frac{2}{5}$  $\frac{3}{7}\times4=\frac{12}{7}=1\frac{5}{7}$ $4\times\frac{3}{7}=\frac{12}{7}=1\frac{5}{7}$

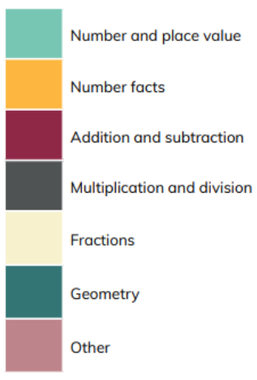
Y5- Overview



Spring 2	Multiply improper fractions and mixed numbers by a whole number (1 week)
Ready to progress	F-1 Find non-unit fractions of quantities. 5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. 5F-3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions.
NCETM documents	TEACHING POINT 2 https://www.ncetm.org.uk/media/cupjlpd1/ncetm_spine3_segment06_y4.pdf#page=5
Small steps	• To represent and multiply an improper fraction by a whole number using repeated addition. • To multiply a mixed number by a whole number where the fractions do not bridge a whole. • To multiply a mixed number by a whole number where the fractions bridge a whole. • To solve problems involving multiplication of fractions and mixed numbers by a whole number. • To solve problems involving fractions and mixed numbers in different contexts.
Links	NCETM page 32 to 38-https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2F5rqnojoj%2Fcp-year-5-unit-8-fractions.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/multiply-improper-fractions-and-mixed-numbers-by-a-whole-number/lessons?sid-53d287=oAJWxf-cNA&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y5%20Autumn%20Block%204%20SOL%20Fractions%20A.pdf Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf
Reasoning	Spot the Mistake 0.088, 0.089, 1.0 What is wrong with this sequence? What number should come after 0.089 when counting in thousandths? Can you correct it? What Comes Next? 1.173, 1.183, 1.193 What number comes next in this sequence? What pattern is increasing each time? How could this help when multiplying fractions or mixed numbers? What Do You Notice? What is one tenth of £41? What is one hundredth of £41? What is one thousandth of £41? How do these relate to multiplying a unit fraction by a whole number? Can you describe the pattern? Continue the Pattern 0.085 + 0.015 = 0.1 0.075 + 0.025 = 0.1 0.065 + 0.035 = 0.1 Continue this pattern to create the next five number sentences that total 0.1. What do you notice about each pair of numbers? Missing Symbol Put the correct symbol < or > in each box: 4.627 ___ 4.06 12.317 ___ 12.31 Explain how you know. How can this help when comparing fractions and their products? Do, Then Explain Circle each decimal that rounds to 6.2 when rounded to one decimal place: 6.32, 6.23, 6.27, 6.17 Explain how you decided. Why is rounding useful when estimating products of fractions? Top Tips How do you round decimal numbers to one decimal place? Write your own method or tip for remembering how to round accurately. Odd One Out Which is the odd one out in each set of fractions? 6/10, 3/5, 18/20, 9/15 30/100, 3/10, 6/20, 3/9 Explain your reasoning. Which fractions are equivalent? How could this help when simplifying answers after multiplying fractions or mixed numbers?

	Multiply improper fractions and mixed numbers by a whole number (1 week)
Problem solving	Click on me
Glossary	• Repeated addition - Repeated addition is the process of adding the same equal group to itself multiple times. • Improper fraction - An improper fraction is a fraction where the numerator is greater than the denominator. • Represent - To represent something is to show it in a different way. • Mixed number - A mixed number is an improper fraction written as its whole number part plus the fractional part, where the fractional part is a proper fraction. • Partition - Partition means to split an object or value down into smaller parts. • Compare - You compare to find out what is the same and what is different. You can compare numbers or expressions to find out if one is greater than or less than another. • Partitioning - Partitioning is the act of splitting an object or value into smaller parts. • Estimate - We can estimate to find a value that is close enough to the right answer, usually with some thought or calculation involved.
Stem sentences	
Representations	 

Y5- Overview



Spring 2	Find unit and non-unit fractions of whole numbers exploring parts and wholes (2 weeks)
Ready to progress	F-1 Find non-unit fractions of quantities. 5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. 5F-3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions.
NCETM documents	TEACHING POINT 3,4 and 5 https://www.ncetm.org.uk/media/cupjlpdl/ncetm_spine3_segment06_y4.pdf#page=5
Small steps	• To find a unit fraction of a quantity using representations. • To explain how finding a fraction of a quantity relates to multiplying by a unit fraction. • To explain how dividing by a whole number relates to multiplying by a unit fraction. • To use knowledge of multiplying a whole number by a unit fraction to solve problems. • To find a non-unit fraction of a quantity using mental and written strategies. • To multiply a whole number by a proper fraction. • To explain when a multiplication calculation represents scaling down or repeated addition. • To find the whole when the size of a unit fraction is known. • To find a unit fraction when the size of a non-unit fraction is known. • To find the whole when the size of a non-unit fraction is known.
Links	NCETM page 32 to 116- https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2F5rqnojoj%2Fcp-year-5-unit-8-fractions.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/find-unit-and-non-unit-fractions-of-whole-numbers-exploring-parts-and-wholes/lessons?sid-ddea37=jLwu5w3dgd&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y5%20Autumn%20Block%204%20SOL%20Fractions%20A.pdf Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf
Reasoning	Odd One Out Which is the odd one out in each group of four fractions? • 6/10, 3/5, 18/20, 9/15 • 30/100, 3/10, 6/20, 3/9 • Why? • Which fractions are equivalent? Which one doesn't belong, and how do you know? What Do You Notice? Find 30/100 of 200 Find 3/10 of 200 What do you notice? Can you write more pairs of fractions that are equivalent and give the same result when finding a part of a whole? Complete the Pattern ¼ × 3 = ¼ × 4 = ¼ × 5 = Continue this pattern for the next five whole numbers. How many steps will it take until the product equals 3? What do you notice about the connection between the multiplier and the product? Another and Another Write a fraction with a denominator of 100 that is worth more than 0.75. ...and another... and another... Can you describe the pattern or relationship? How can this help you when comparing fractions or scaling values? Ordering Put these numbers in order, starting with the largest: 7/10, 0.73, 7/100, 0.073, 71% Explain your thinking. Which ones are equivalent? How did you compare them? Which Is More? Which is greater: • 20% of 200 • 25% of 180 • Explain your reasoning. • How could you solve this using fractions or scaling? Undoing I divide a number by 100 and the answer is 0.33. What number did I start with? Explain how you used inverse operations or multiplying by a unit fraction to solve this.

Find unit and non-unit fractions of whole numbers exploring parts and wholes (2 weeks)

Problem solving

Click on me

Glossary

- Representation - A representation is a way of showing an idea or concept. One concept can be be shown by multiple representations.
- Relationship - A relationship is a connection between two or more things.
- Unit fraction - A unit fraction is a fraction that has a numerator of one.
- Expression - An expression contains one or more values, where each value is separated by an operator.
- Equation - An equation is used to show that one number, calculation or expression is equal to another.
- Denominator - The denominator is the bottom number in a fraction.
- Equation - An equation is used to show that one number, calculation or expression is equal to another.
- Strategy - A strategy is a plan or method to achieve a specific goal.
- Non-unit fraction - A non-unit fraction is a fraction that has a numerator greater than one.
- Scaling - Scaling is when something is transformed, through either shrinking or enlarging by a scale factor.
- Repeated addition - Repeated addition is when the same object or value is added to itself more than once.
- Numerator - The numerator is the number on the top of a fraction. It tells us how many parts we have/need.
- Denominator - The denominator is the number on the bottom of a fraction. It tells us how many parts the whole has been divided into.

Stem sentences

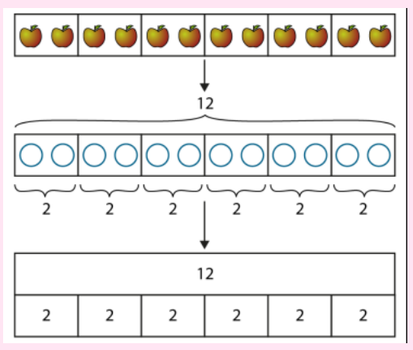
The whole is divided into _____ equal parts.
Each part is _____ of the whole.
When _____ apples are split into _____ equal parts, there are _____ apples in each part.
Each part is 1/___ of the whole;
1/_____ of _____ apples is _____ apples.
Each part is 1/____ of the whole;
1/_____ of _____ is _____.
_____ is divided into _____ equal parts; each part if 1/_____ of the whole.
1/____ of _____ = _____
_____ of _____ = _____
_____ lots of _____ = _____

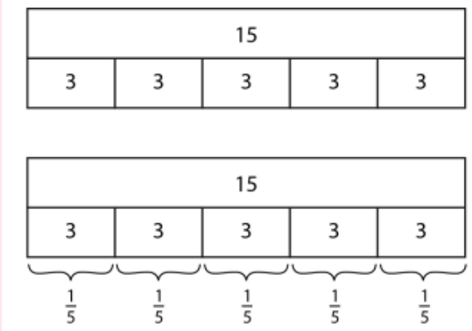
When a whole number is multiplied by a unit fraction, it makes the whole number smaller.

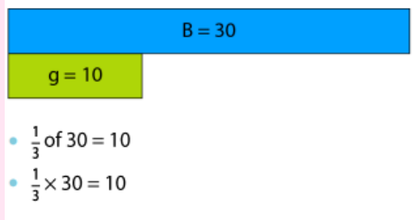
To calculate a fraction of a quantity, find the unit fraction of the quantity. Then multiply the unit fraction by the numerator

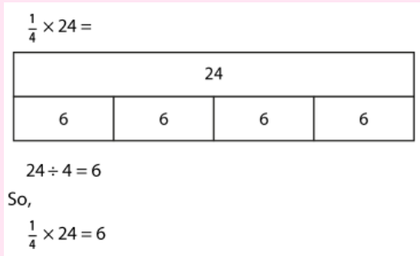
If we know the size of a unit fraction, we can work out the size of the whole.

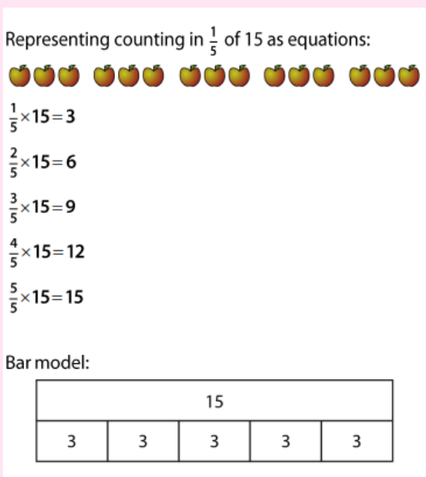
Representations

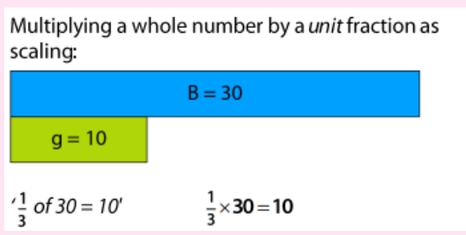


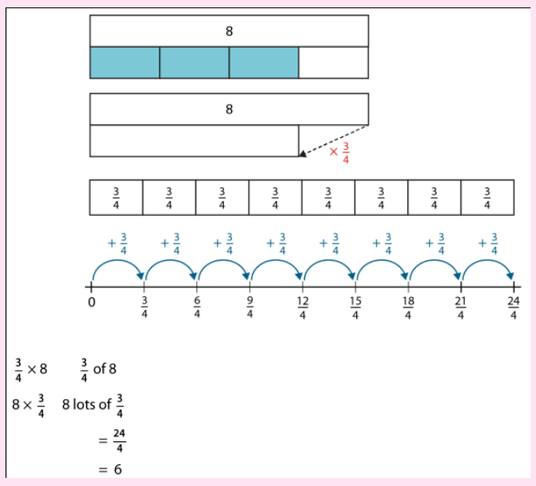






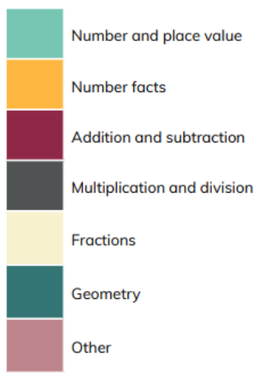






Part	Part as a fraction of the whole	Number of equal parts in the whole	Whole
	1/5	5	

Y5- Overview



Spring 2	Comparing fractions using equivalence and decimals (3 weeks)
Ready to progress	F-1 Find non-unit fractions of quantities. 5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. 5F-3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions.
NCETM documents	TEACHING POINT 1 AND 2 https://www.ncetm.org.uk/media/d45jqjsc/ncetm_spine3_segment07_y5.pdf#page=32 TEACHING POINT 1, 2 AND 3 https://www.ncetm.org.uk/media/bjbla4ci/ncetm_spine3_segment10_y6.pdf#page=3
Small steps	• To find a unit fraction of a quantity using representations. • To explain how finding a fraction of a quantity relates to multiplying by a unit fraction. • To explain how dividing by a whole number relates to multiplying by a unit fraction. • To use knowledge of multiplying a whole number by a unit fraction to solve problems. • To find a non-unit fraction of a quantity using mental and written strategies. • To multiply a whole number by a proper fraction. • To explain when a multiplication calculation represents scaling down or repeated addition. • To find the whole when the size of a unit fraction is known. • To find a unit fraction when the size of a non-unit fraction is known. • To find the whole when the size of a non-unit fraction is known.
Links	NCETM SLIDE 116 TO END- https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2F5rqnojoj%2Fcp-year-5-unit-8-fractions.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/comparing-fractions-using-equivalence-and-decimals/lessons?sid-d1325f=DCc4LJRZ3_&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y5%20Autumn%20Block%204%20SOL%20Fractions%20A.pdf Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf
Reasoning	Odd One Out Which is the odd one out in each group of four fractions? • 6/10, 3/5, 18/20, 9/15 • 30/100, 3/10, 6/20, 3/9 Why? Which fractions are equivalent? Which one doesn't belong? How can you prove it using representations or simplification? What Do You Notice? Find: • 30/100 of 200 • 3/10 of 200 What do you notice? Can you find more pairs of equivalent fractions that give the same result? What does this show you about equivalent fractions when working with quantities? Complete the Pattern ¼ × 3 = ¼ × 4 = ¼ × 5 = Continue the pattern for the next five numbers. How many steps will it take until the product equals 3? What do you notice about the relationship between the whole number and the result? Another and Another Write a fraction with a denominator of 100 that is greater than 0.75. … and another … and another … Can you describe a rule or pattern for creating these? How can this help you compare and scale values? Ordering Put these numbers in order from largest to smallest: 7/10, 0.73, 7/100, 0.073, 71% Explain your thinking. Which numbers are equivalent? How did you compare the values (e.g. converting to the same format)? Which Is More? Which is greater: • 20% of 200 • 25% of 180 Explain your reasoning. Can you solve using equivalent fractions or by scaling each value? Undoing I divide a number by 100 and the answer is 0.33. What number did I start with? Explain how inverse operations or multiplying by a unit fraction help you solve this.

Comparing fractions using equivalence and decimals
(3 weeks)

Problem solving

Click on me

Glossary

- Divided - When something is divided, it is split into equal parts or groups.
- Equal parts - Equal parts can be combine to make a whole.
- Numerator - The numerator is the top number in a fraction and shows how many equal parts we have.
- Denominator - The denominator is the bottom number in a fraction and shows how many equal parts the whole has been divided into.
- Equivalent fractions - Equivalent fractions are fractions which have the same value, even though they may look different.
- Proportion - The proportion of a number, shape or group of objects is a part of the whole.
- Scale/scaling - Scaling is when a quantity is made ___ times the size.
- Scale up and down - Scaling is when a quantity is made a number of times the size. To scale up is to multiply by a factor. To scale down is to multiply by a fraction or to divide.
- Common factor - When you are comparing the factors of two numbers, a common factor is one shared by both numbers.
- Simplest form - When a fraction is in its simplest form, the numerator and denominator only share a common factor of one.
- Simplify - To simplify a fraction is to identify the highest common factor shared by the numerator and denominator and to scale down both by that factor.
- Divide - Each equal part has the same value as the others in the whole.
- Equivalent - Numbers are equivalent if they have exactly the same value.
- Tenth - When one whole is divided into 10 equal parts, each part is one tenth. This can be expressed as a fraction or as a decimal.
- Hundredth - When one whole is divided into 100 equal parts, each part is one hundredth. This can be expressed as a fraction or as a decimal.
-

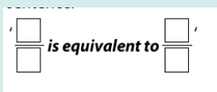
Stem sentences

The whole is divided into _____ equal parts and we have _____ of those parts.

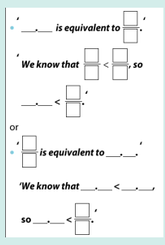
Sometimes two fractions have the same value. We call these equivalent fractions.

The whole is divided into _____ equal parts and we _____ these parts is/are shaded.

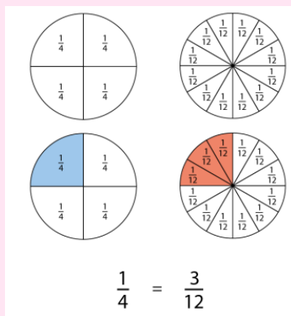
The numerator has been scaled up/ down by _____. The denominator has been scaled up/down by ___.'
'These fractions are/are not equivalent.'

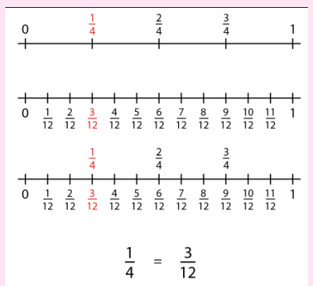


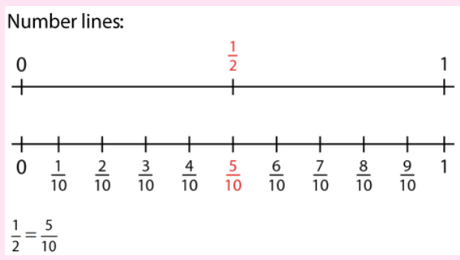
When the numerator and denominator are multiplied or divided by the same number, the value of the fraction remains the same.

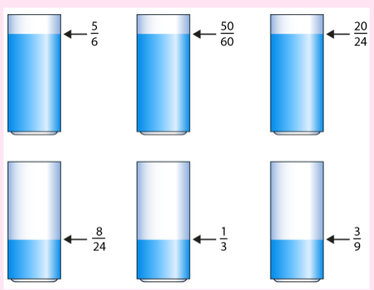


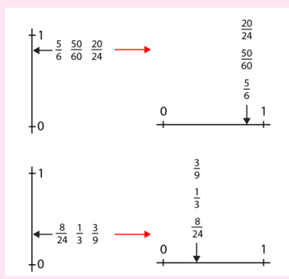
Each whole has been divided into _____ equal parts.
Each part is one _____ of the whole.

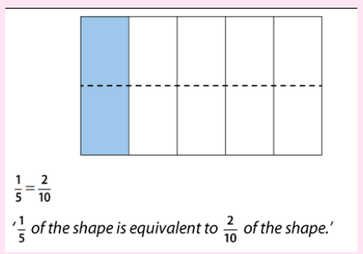


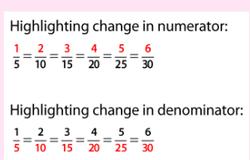


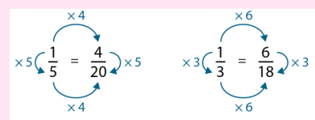






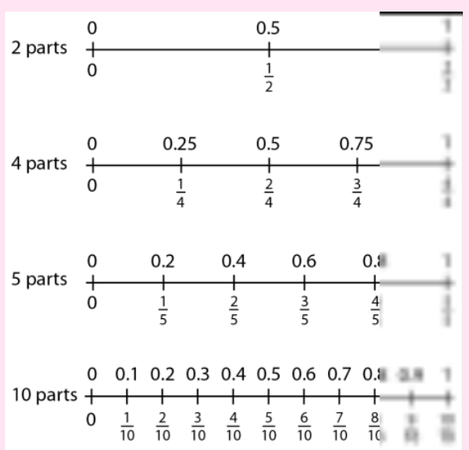


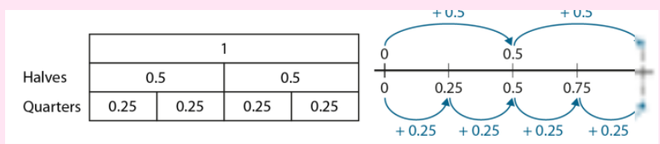




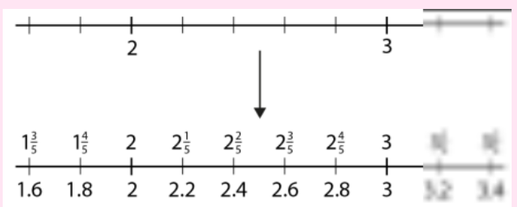
Fraction notation	Decimal notation	Name
$\frac{1}{10}$	0.1	one-tenth
$\frac{1}{100}$	0.01	one-hundredth

Fraction	Decimal
$\frac{1}{2}$	0.5
$\frac{1}{3}$	0.33333…
$\frac{1}{4}$	0.25
$\frac{1}{5}$	0.2
$\frac{1}{6}$	0.1666…
$\frac{1}{7}$	0.14285714…
$\frac{1}{8}$	0.125
$\frac{1}{9}$	0.111…
$\frac{1}{10}$	0.1





2 parts	$\frac{1}{2} \times 1{,}000$	$\frac{1}{2} \times 100$	$\frac{1}{2} \times 10$	$\frac{1}{2} \times 1$
4 parts	$\frac{1}{4} \times 1{,}000$	$\frac{1}{4} \times 100$	$\frac{1}{4} \times 10$	$\frac{1}{4} \times 1$
5 parts	$\frac{1}{5} \times 1{,}000$	$\frac{1}{5} \times 100$	$\frac{1}{5} \times 10$	$\frac{1}{5} \times 1$
10 parts	$\frac{1}{10} \times 1{,}000$	$\frac{1}{10} \times 100$	$\frac{1}{10} \times 10$	$\frac{1}{10} \times 1$



- 'Each whole has been divided into five equal parts.'
- 'Each part is one-fifth of the whole.'

Method 1 – converting to decimals:

$3\frac{1}{4} \lessgtr 3.4$

$3\frac{1}{4} = 3.25$

$3.25 < 3.4$

Method 2 – converting to fractions with a common denominator:

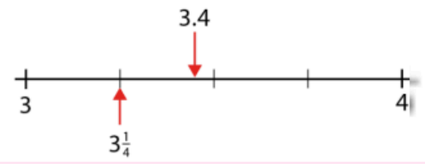
$3\frac{1}{4} \lessgtr 3.4$

$3.4 = 3\frac{4}{10} = 3\frac{16}{40}$

$3\frac{1}{4} = 3\frac{10}{40}$

$3\frac{10}{40} < 3\frac{16}{40}$

Method 3 – positioning on a number line:

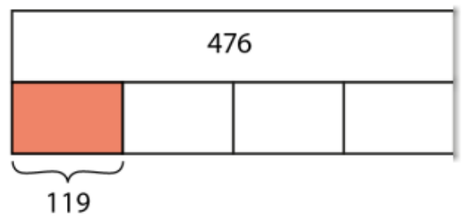


$476 \div 4$

$\frac{1}{4}$ of 476

$\frac{1}{4} \times 476$

0.25×476



Method 1:

$$\begin{array}{r} \cancel{1}\,\cancel{1} \\ \cancel{3}\,\cancel{3} \\ 4\;7\;6 \\ \times\quad 0\,.\,2\,5 \\ \hline 2\;3\,.\,8\;0 \\ 9\;5\,.\,2\;0 \\ \hline 1\;1\;9\,.\,0\;0 \\ \hline 1 \end{array}$$

Method 2:

$$\begin{array}{r} 1\;1\;9 \\ 4\,\overline{)\,4\;7\;{}^{3}6} \end{array}$$

Method 1:

$0.2 \times 75 = \frac{1}{5} \times 75$

$$\begin{array}{r} 1\;\;5 \\ 5\,\overline{)\,7\;{}^{2}5} \end{array}$$

Method 2:

$\frac{1}{10}$ of $75 = 7.5$

$\frac{2}{10}$ of $75 = 15$

Method 3:

$2 \times 75 = 150$

$0.2 \times 75 = 15$ $\div 10$

Possible methods to solve *685 × 0.2:*

Method 1:

$685 \times 0.2 = 137$

$685 \times \frac{1}{5}$

$$\begin{array}{r} 1\;\;3\;\;7 \\ 5\,\overline{)\,6\;{}^{1}8\;{}^{3}5} \end{array}$$

Method 2:

$685 \times 0.2 = \frac{2}{10}$ of $685 = 137$

$\frac{1}{10}$ of $685 = 68.5$

$$\begin{array}{r} 6\;8\,.\,5 \\ \times\qquad 2 \\ \hline 1\;3\;7\,.\,0 \\ \hline 1\;1\quad \end{array}$$