

## KS3 Maths

### Number- Multiplication, division and fractions

<b>Subject curriculum intent:</b>	<p>We want our pupils to be able to develop functional number skills so that they are able to be as independent as possible. Depending on the cognitive ability of students, they will begin to use their times table skills to complete a range of multiplication and division problems. Students will begin to share items into groups and begin to recognise doubling and halving.</p> <p>We want our pupils to...</p> <ol style="list-style-type: none"><li>1. develop <b>fluency</b> in the fundamentals of mathematics so that they are efficient in using and selecting the appropriate strategies to <b>use number skills</b> including mental methods, underpinned by mathematical concepts</li><li>2. can <b>solve problems by</b> applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios</li><li>3. can <b>reason mathematically</b> by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.</li></ol> <p><b>In all math lessons, teachers plan engaging lessons with the aim that pupils:</b></p> <ul style="list-style-type: none"><li>• master skills in maths which they are then able to apply to a range of contexts within the school and home context</li><li>• embed their new skills and understanding to a range of contexts; thus supporting application and progress in learning</li><li>• acquire core mathematical skills to support their independence as they progress through the school</li><li>• are able to apply their understanding; supporting them in other areas of the curriculum</li></ul>	
<b>End of KS3 intent/outcome</b>	<b>End of KS4 intent/outcome</b>	<b>End of KS5 intent/outcome</b>
Students will be introduced to the key vocabulary around multiplication and division. Students will be taught to group items to match a multiplication sentence and will be taught to share items into groups to develop division skills. Students will be able to use shapes to recognise common fractions including halves and quarters.	Students will continue to build on their learning from KS3. Students will continue to group or share items to match multiplication and division sentences. Students will begin to use arrays to complete multiplication and division calculations. Students will begin to use fractions in practical settings, using their understanding of fractions when baking for the community café. They will begin to use and apply their shape fraction skills to find fractions of number as a visual aid.	Students will continue to build on their KS4 knowledge. Students will apply their knowledge of multiplication and division to real life situations such as using skills to multiply or divide ingredients in a recipe as well as grouping laundry or items of clothing.
Intent for this topic:	This half term, pupils will develop their understanding of grouping and sharing. Students will be able to group items based on a given multiplication calculation, as well as sharing items between groups to represent division. Students will follow staff modelling to know how to	

use everyday equipment to show multiplication and division calculations. When learning about fractions, students will separate common 2D shapes into pieces and will recognise when everyday shapes have been separated evenly and fairly.

Key vocabulary taught within this topic:	Times tables, multiplication, division, multiply, divide, group, equal, sharing, 2 times tables, 3 times table, 4 times tables, 5 times tables, 6 times tables, 7 times tables, 8 times tables, 9 times tables, 10 times tables, 11 times tables, 12 times tables, whole, half, quarters, array
Links to other subjects:	<ul style="list-style-type: none"> <li>- Cook-It</li> <li>- PSHCE</li> </ul>
Links to equality and diversity	<ul style="list-style-type: none"> <li>- Sharing equally</li> <li>- Being fair</li> </ul>

**Suggested flow:**

This flow is to be used as a guide. Teachers to adapt the flow to meet the needs and abilities of students within their class.

<b>Week 1</b>	<b>Week 2</b>	<b>Week 3</b>	<b>Week 4</b>	<b>Week 5</b>	<b>Week 6</b>
<b><u>Multiplication:</u></b>		<b><u>Division:</u></b>		<b><u>Fractions:</u></b>	
Multiplying by 2 (link to doubling)		Dividing by 2 (link to halving).		Fractions of shapes.	
Multiplying by 2, 5 and 10).		Dividing equally into groups.		Fractions of amounts.	
Using arrays.		Sharing items equally.			
Early algebra skills.		Early algebra skills.		Using and applying statistics.	
		Using and applying early statistics skills.			

**KS3- Multiplication and Division**

	B2 progression step 5	B2 progression step 6-8	B2NC step 1c-1b	B2NC Step 1b-2c	B2NC Step 2c-2a	B2NC Step 2a-3a
<p><b>Subject specific knowledge</b></p> <p><b>What do pupils need to know?</b></p>	<p><u>To know</u> the word 'share' and respond appropriately.</p>	<p><u>To know</u> words 'share', 'half' and 'equal'</p> <p><u>To know</u> method 'one for you, one for me'</p> <p><u>To know</u> sharing needs to be equal and 'fair'</p> <p><u>To know</u> cutting objects in half need to be in equal pieces</p> <p><u>To know</u> the word 'double' and connect to repeated addition.</p> <p><u>To know</u> doubles to the total of 10 and recall confidently</p>	<p><u>To know</u> the word 'double' and connect to multiplying by 2.</p> <p><u>To know</u> doubles to the total of 20 and recall confidently</p> <p><u>To know</u> key words : multiply and divide</p> <p><u>To know</u> symbols: x and ÷</p> <p><u>To know</u> multiplying is linked to repeated addition</p> <p><u>To know</u> division is linked to sharing</p>	<p><u>To know</u> times tables 2s and 10s</p> <p><u>To know</u> what an 'array' is and how to use it.</p>	<p><u>To know and use</u> multiplication facts for 2,5 and 10</p> <p><u>To know</u> the multiplication of 2 numbers can be done in any order</p> <p><u>To know</u> what a factor and multiple is</p>	<p><u>To know</u> and recall multiplication and division facts for 3, 4 and 8</p> <p><u>To know</u> how to use formal written methods for multiplying 2-digit numbers</p>
<p><b>Subject specific skills</b></p> <p><b>What do pupils need to be able to do?</b></p>	<p><u>Is able to</u> pass / share objects amongst peers in response to being asked to 'share'</p> <p><u>Is beginning to</u> group objects in 2s and 3s</p>	<p><u>Is able to</u> use vocabulary: share and half in structured and unstructured conversations</p> <p><u>Is able to</u> share objects between two people using correct method.</p>	<p><u>Is able to</u> double quantities to the sum of 20 (first using concrete resources, then jottings and then recall.</p> <p><u>Is able to</u> represent the multiplication of 2s and 5s using concrete objects</p>	<p><u>Is able to</u> represent the multiplication of 2, 5 and 10 using arrays</p> <p><u>Is able to</u> explore number patterns for multiplication (number square etc)</p> <p><u>Is able to</u> share any given amount equally</p>	<p><u>Is able to</u> calculate and write multiplication number sentences using x , ÷ and =</p> <p><u>Is able to</u> solve contextual multiplication and division problems</p>	<p><u>Is able to</u> use an array to give creative multiplication or division number sentences for a multiple</p> <p><u>Is able to</u> multiply 2-digit numbers by 1-digit numbers</p>

		<u>Is able to</u> double quantities to the sum of 10 (first using concrete resources, then jottings and then recall.	<u>Is able to</u> represent simple multiplication as a number sentence  <u>Is able to</u> represent simple division as a number sentence  <u>Is able to</u> represent division by sharing objects in 2s	using concrete objects  <u>Is beginning to</u> solve one step division and multiplication problems using arrays with support from an adult	using a range of resources	using facts they already know  <u>Is able to solve</u> problems involving multiplication and division; including scaling
<b><u>Suggested teaching activities</u></b>	<ul style="list-style-type: none"> <li>• Sharing items between plates</li> <li>• Printing doubles</li> <li>• Multiplication songs</li> <li>• Times table speed recall</li> <li>• Mirrors (doubling)</li> </ul>					

### KS3- Fractions

	<u>B2 progression step 5</u>	<u>B2 progression step 6-8</u>	<u>B2NC step 1c-1b</u>	<u>B2NC Step 1b-2c</u>	<u>B2NC Step 2c-2a</u>	<u>B2NC Step 2a-3a</u>
<b><u>Subject specific knowledge</u></b>  <b>What do pupils need to know?</b>	<u>To know</u> cutting an object creates more smaller pieces	<u>To know</u> when two pieces haven't been cut fairly - equally  <u>To know</u> where to cut / draw a line to represent 2 equal parts - halves  <u>To know</u> key words: half, equal, same and fair.	<u>To know</u> key word: fraction  <u>To know</u> representations of $\frac{1}{2}$ via images, resources and words (half)	<u>To know</u> representations of $\frac{1}{4}$ via images, resources and words (quarter)  <u>To know</u> half of even numbers to 10  <u>To know</u> to use 'sharing model' to find $\frac{1}{4}$ of numbers/objects e.g. 4 plates, share 16 apples.	<u>To know</u> half of numbers to 20  <u>To know</u> representations of $\frac{1}{3}$ and $\frac{1}{8}$ via images, resources and words (third/eighths)  <u>To know</u> the equivalence of $\frac{2}{8}$ and $\frac{1}{4}$	<u>To know</u> and read all fractions represented as numbers  <u>To know</u> key word: denominator  <u>To know</u> the denominator represents the number of equal pieces the whole has been split into
<b><u>Subject specific skills</u></b>	<u>Is able to</u> experience cutting food into pieces	<u>Is able to</u> roughly cut a piece of food in half	<u>Is able to</u> recognise and name $\frac{1}{2}$ as two EQUAL parts	<u>Is able to</u> recognise and name $\frac{1}{4}$ and 1 of 4 equal parts	<u>Is able to</u> recognise, find, name and write fractions : $\frac{1}{3}$ , $\frac{1}{4}$	<u>Is able to</u> count up and down in tenths by dividing an

<p><b>What do pupils need to be able to do?</b></p>		<p><u>Is able to</u> say why something hasn't been cut into equal pieces</p> <p><u>Is able to</u> independently use key words 'equal' and 'fair' in structured and unstructured setting e.g. play</p>	<p><u>Is able to</u> correctly use the terminology "Equal pieces"</p> <p><u>Is able to</u> find <math>\frac{1}{2}</math> of a shape or quantity</p>	<p><u>Is able to</u> find <math>\frac{1}{4}</math> of an object, shape or quantity</p>	<p>2/4 and <math>\frac{3}{4}</math> of a shape/set of objects</p> <p><u>Is able to</u> calculate simple fractions of number e.g. <math>\frac{1}{2}</math> of 6 = 3</p>	<p>objects into 10 equal parts</p> <p><u>Is able to</u> recognise and use fractions as numbers</p> <p><u>Is able to</u> show, using diagrams, equivalent fractions with small denominators</p> <p>To be able to add and subtractions with the same denominator</p> <p>To be able to compare and order fractions with the same denominator</p>
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<p><b><u>Suggested teaching activities</u></b></p>	<ul style="list-style-type: none"> <li>• Cut up food</li> <li>• Cut up playdough</li> <li>• Cut up food/playdough</li> <li>• Talk about fair - fair story</li> <li>• Fair/equal story</li> <li>• Cut shapes into half - could weigh pieces to see if they are roughly equal</li> <li>• Have shapes made out of playdough and cut using knife</li> <li>• Cut bread into <math>\frac{1}{4}</math> (can be things grown)</li> <li>• Cut playdough into <math>\frac{1}{4}</math> - could weigh pieces to see if they are roughly equal</li> <li>• Connect to position and direction - quarter turns to move around the soft play room</li> <li>• Place number of pieces into a fraction of a shape e.g fit two <math>\frac{1}{4}</math> pieces into a half block to represent equivalent fractions</li> <li>• Fraction wall</li> <li>• Lego pieces to represent fractions and equivalent fractions</li> <li>• Connect to position and direction - quarter, half, three-quarter turns when moving around soft play area</li> </ul>
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