

**Unit 10**  
**Understanding multiplication and division**  
**Mental calculation strategies (x and ?)**

Five daily lessons

**Merseyside Consultants'**  
**Cluster Group**

**Year 2**  
**Autumn term**

**Unit Objectives**

**Year 2**

<b>Understand multiplication as repeated addition</b>	P47
Use the related vocabulary	P47
Use x and = signs and ? to stand for unknown number	P47
Use known facts to carry out simple multiplication	P53
Add and multiply mentally to solve simple word problems	P49

This Unit Plan is designed to guide your teaching.

You will need to adapt it to meet the needs of your class.

**Resources needed to teach this unit:**

- Pegboards
- Digit cards 1 – 10, 20, 30, 40, 50
- Whiteboards
- Large digit cards 1- 5
- Coloured card circles
- Digit cards 1 - 9

**Link Objectives**

**Year 1**

**Year 2**

(This box is empty, representing Year 1 link objectives)

Understand multiplication as repeated addition and as an array.  
 Read and begin to write related vocabulary.  
 Recognise that x can be done in any order.  
 To multiply by 10/100 shift the digits one place to the left.

(Key objectives in bold)

Planning sheet	Day One	Unit 10 <i>Understanding multiplication and division, mental calculation strategies (x and ?)</i>		Term: <i>Autumn</i>	Year Group: 2
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions	
		<p>Understand x as repeated + Use related vocabulary Use known facts to carry out simple multiplication</p> <p>VOCABULARY Times Multiply x Lots of Groups of Array</p> <p>RESOURCES</p>	<p>Ask the question</p> <p><b>Q</b> Every day at break Sam has 5 grapes for his snack. How many grapes does he eat at school during the week? <b>Q</b> What calculation do we need to do?</p> <p>Establish that Sam eats grapes on Monday, Tuesday, Wednesday, Thursday and Friday.</p> <p><b>Q</b> How many days does he eat grapes? Explain it is 5 days.</p> <p><b>Q</b> How many grapes does he eat each day? Explain it is 5.</p> <p><b>Q</b> So how can we work out 5 lots of 5? Discuss <math>5 + 5 + 5 + 5 + 5 = 25</math></p> <p><b>Q</b> Do you know another way to write this? Explain it can be written as 5 lots of 5.</p> <p><b>Q</b> Do we know a sign that represents lots of? Discuss the x sign and what it means. Write up vocabulary related to x eg lots of, groups of, multiply, times.</p> <p><b>Q</b> How do we work out <math>5 \times 5</math>? Represent <math>5 \times 5</math> as an array, using grapes</p> <pre> 0 </pre> <p>Explain by adding <math>5 + 5 + 5 + 5 + 5</math> or we could use the 5 times table and count up in 5's.</p> <p><b>Q</b> So how many grapes does Sam eat during a week at school?</p>	<p>Look at children's example of own problem and solve as a class, showing method as repeated +, an array and a multiplication sum.</p> <p><b>By the end of the lesson children should be able to:</b></p> <p><b>Understand that multiplication can be shown as repeated addition, an array and a calculation.</b></p> <p>(Refer to supplement of examples, section 5, page 47 )</p>	

<b>Planning sheet</b>	<b>Day One (Cont'd)</b>	<b>Unit 10 <i>Understanding multiplication and division, mental calculation strategies (x and ?)</i></b>	<b>Term: <i>Autumn</i></b>	<b>Year Group: 2</b>
<b>Oral and Mental</b>		<b>Main Teaching</b>		<b>Plenary</b>
<b>Objectives and Vocabulary</b>	<b>Teaching Activities</b>	<b>Objectives and Vocabulary</b>	<b>Teaching Activities</b>	<b>Teaching Activities/ Focus Questions</b>
			<p>Establish answer is 25 grapes.</p> <p>Discuss methods used.</p> <p>Activities. Children make up own problems involving the vocabulary of x and show answer using array of repeated addition.</p>	

Planning sheet		Day Two	Unit 10 <i>Understanding multiplication and division, mental calculation strategies (x and ?)</i>	Term: Autumn	Year Group: 2
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions	
		<p>use x and = signs and ? to stand for unknown number</p> <p>Use known facts to carry out simple multiplication</p> <p>VOCABULARY</p> <p>RESOURCES</p>	<p>Start with question.</p> <p><b>Q</b> How many wheels are there on 3 cars?  <b>Q</b> What calculation do we need to do?</p> <p>Discuss with partner and take responses,</p> <p>4 x 3 or 3 x 4</p> <p><b>Q</b> Are these the same? Do they give the same answer?</p> <p>Discuss they are the same and prove drawing 2 arrays</p> <pre> x x x x   x x x x x x x   x x x x x x x   x x x            x x x </pre> <p><b>Q</b> How do we work out 4 x 3?</p> <p>Children talk to partner and explain methods, ie 4 + 4 + 4, using an array, counting up in 4's 3 times or 3 + 3 + 3 + 3, counting up in 3's 4 times.</p> <p>Write 6 x 2 = ?</p> <p><b>Q</b> What could be the possible question to go with this calculation?</p> <p>Discuss in pairs, take responses. Model how to work it out using repeated + and arrays.</p> <p><u>Activity</u></p> <p>Children given multiplications with ? to represent answer, which they invent own questions for.</p> <p>Show working in arrays and repeated +.</p>	<p>Write on board</p> <p>9 x ? = 18</p> <p><b>Q</b> What does this mean?</p> <p>Discuss it means 9 x something makes 18 or there are 18 altogether made from 9 groups of something.</p> <p><b>Q</b> How would we work this out?</p> <p>Discuss ideas and model on number line counting up in 9's until reaching 18.</p> <p><b>Q</b> How many jumps of 9 did we do?</p> <p>Answer 2 so</p> <p>9 x 2 = 18</p> <p>Show this as repeated + and an array.</p> <p><b>By the end of the lesson children should be able to:</b></p> <p>?? <b>Find unknown numbers using arrays or repeated addition.</b></p> <p>(Refer to supplement of examples, section 5, page 47 )</p>	

<b>Planning sheet</b>	<b>Day Three</b>	<b>Unit 10 Understanding multiplication and division, mental calculation strategies (x and ?)</b>	<b>Term: Autumn</b>	<b>Year Group: 2</b>
<b>Oral and Mental</b>		<b>Main Teaching</b>		<b>Plenary</b>
<b>Objectives and Vocabulary</b>	<b>Teaching Activities</b>	<b>Objectives and Vocabulary</b>	<b>Teaching Activities</b>	<b>Teaching Activities/ Focus Questions</b>
		<p>Use known facts to carry out simple multiplication.</p> <p>VOCABULARY</p> <p>Times Multiply Repeated addition</p> <p>RESOURCES</p> <p>Digit cards 1 – 10,20,30,40,50 Whiteboards.</p>	<p><b>Q.</b> What is double 6?</p> <p>Children to show answers using number fans.</p> <p><b>Q.</b> How can we write the calculation to show double 6?</p> <p>Children to discuss with their partners. Ask for volunteers to come and write calculation on the board.</p> <p>e.g. <math>6 \times 2</math> or <math>6 + 6</math></p> <p>So we know that double 6 can be written as repeated addition or <math>\times 2</math>.</p> <p>Using whiteboards children to write calculation to represent the following questions.</p> <p><b>Q.</b> Double 8?</p> <p>Give children time to discuss with their partners and write the answers on whiteboards.</p> <p>Ask for volunteers to write the calculation and the answer on the board and explain their methods.</p> <p>Repeat with other doubles.</p> <p><b>Q.</b> If we know double 3 is 6, then what is double 30?</p> <p>Ask the children how they could work out this calculation and to explain their methods to the rest of the class. e.g. 3 tens and 3 tens makes 6 tens or 60</p> <p><b>Q.</b> How could we write this as a calculation.</p> <p>Take children's responses and ask a volunteer to write the calculation on the board.</p> <p>e.g. <math>30 \times 2 = 60</math> or <math>30 + 30 = 60</math></p> <p>Repeat with other multiples of 10</p> <p>Activities. Using digit cards 1 – 10,20,30,40,50 children to choose a card and write the calculation to show the double and work out the answer.</p>	<p>Remind children how they worked out double 30.</p> <p><b>Q.</b> What is double 200?</p> <p>Children to discuss with their partners and explain their methods.</p> <p>Show this practically using Deans blocks.</p> <p>Ask children to show how to write the calculation for double 200 and model finding the answer.</p> <p><b>By the end of the lesson children should be able to:</b></p> <p><b>Double and halve numbers .</b></p> <p>(Refer to supplement of examples, section 5, page 53 )</p>

Planning sheet	Day Four	Unit 10 <i>Understanding multiplication and division, mental calculation strategies (x and ?)</i>	Term: <i>Autumn</i>	Year Group: <b>2</b>
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
		<p>Use known facts to carry out simple multiplication.</p> <p>Use x , = and □ to stand for an unknown number.</p> <p>VOCABULARY</p> <p>Multiplication</p> <p>RESOURCES</p> <p>Large digit cards 1-5 Pegboards Whiteboards Coloured circles Digit cards 1 - 9</p>	<p>Ask a child to come out and pick two of the large digit cards.</p> <p>e.g. 4 and 2</p> <p>Ask the children to use these cards to make a multiplication sum and write this on their whiteboards. Take responses.</p> <p>e.g. 4 x 2 or 2 x 4</p> <p>On the board stick coloured circles to show the arrays to represent these calculations.</p> <p>           O o o o            o o            O o o o            o o                                  o o                                  o o         </p> <p><b>Q.</b> How many circles?</p> <p><b>Q.</b> Does it matter if we do 4 x 2 or 2 x 4?</p> <p>Children to realise that the answer is the same whichever way they do the multiplication.</p> <p>Repeat using other digit cards showing arrays and the calculations.</p> <p>Activities. Children to pick digit cards from the range 1 – 9 and make arrays on pegboards then write the calculations to represent the array.</p>	<p>6 x □ = 18</p> <p><b>Q.</b> How could we work this out using pegboards?</p> <p>Children to discuss and share their answers with the class.</p> <p>Model using circles to show an array.</p> <p>Count out 18 circles – this is the answer so we know that we need this many circles for the array.</p> <p>Put the circles into rows of 6 and ask the children to count the number of rows.</p> <p>           o o o o o o            o o o o o o            o o o o o o         </p> <p>Ask children to work out</p> <p>5 x □ = 20</p> <p><b>By the end of the lesson children should be able to:</b></p> <p><b>Find unknown values of numbers using arrays.</b></p> <p>(Refer to supplement of examples, section 5, page 47 )</p>

Planning sheet	Day Five	Unit 10 <i>Understanding multiplication and division, mental calculation strategies (x and ?)</i>	Term: <i>Autumn</i>	Year Group: <b>2</b>
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/ Focus Questions
<input type="checkbox"/>		<p>Add + x mentally to solve simple word problems</p> <p>VOCABULARY Multiply Array 2 step problem</p> <p>RESOURCES</p>	<p><b>Q.</b> I think of a number then double it. My answer is 18. What is my number? Ask the children to discuss with their partners how to solve this problem, then share their ideas with the rest of the class.</p> <p><b>Q.</b> What is the calculation we need to solve? <input type="checkbox"/> <math>x 2 = 18</math></p> <p>Ask children to explain methods to find the answer.  e.g. use an array or knowing double 9 is 18.</p> <p><b>Q.</b> Two people have 8 cakes each. How many cakes altogether? One person gives 2 cakes to the other person. How many cakes does each have now?</p> <p>Ask the children to discuss how they will solve this problem and to share their methods.</p> <p>Establish that there are two parts to this problem: How many cakes altogether? How many cakes will each person have at the end? ?? The calculations are:  Double 8 = 16 <math>8 - 2 = 6</math> <math>8 + 2 = 10</math></p> <p>Work through this problem with the children.</p> <p>Activities. - Children to devise 2 step problems involving multiplication and addition and then produce an answer sheet showing the calculations and the answers.</p>	<p>Choose one of the children’s 2 step problems to work through as a class, discussing methods and calculations needed as well as the answers</p> <p><b>By the end of the lesson children should be able to:</b></p> <p><b>Use multiplication to solve problems.</b></p> <p>(Refer to supplement of examples, section 5, page 67 )</p>