

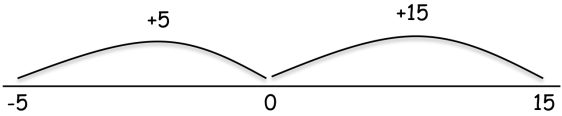
Class: Year 3	Year:	Term: Spring 1	Weeks (to)	Teacher:
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<p>Prior learning – check that children can already:</p> <ul style="list-style-type: none"> • talk about their methods and solutions to one-step problems, identifying and recording the number sentences involved • read, write, partition and order two-digit numbers, explaining what each digit represents • recall all addition and subtraction facts for each number to at least 10, all pairs with totals to 20 and all pairs of multiples of 10 with totals up to 100 • add or subtract mentally pairs of one-digit numbers • recall multiplication and division facts for the 2, 5 and 10 times-tables 	<p>Learning objectives:</p> <ul style="list-style-type: none"> • Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing, using pictures and diagrams • Order whole numbers to at least 1000 and position them on a number line • Partition three-digit numbers into multiples of 100, 10 and 1 in different ways • Round two-digit or three-digit numbers to the nearest 10 or 100 and give estimates for their sums and differences • Derive and recall all addition and subtraction facts for each number to 20, sums and differences of multiples of 10 and number pairs that total 100 (all homework tasks) • Add or subtract mentally combinations of one-digit and two-digit numbers • Develop and use written methods to record, support or explain addition and subtraction of two–digit and three–digit numbers • Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect • Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and the corresponding division facts (all homework tasks); recognise multiples of 2, 5 or 10 up to 1000 • Follow up others' points and show whether they agree or disagree in a whole-class discussion 	<p>Vocabulary:</p> <p>problem, solution, calculate, calculation, answer, method, explain, reasoning, pattern, predict</p> <p>place value, partition, digit, ones, tens, hundreds, one-digit number, two-digit number, three-digit number, compare, order, equals (=</p> <p>count on/back, add, subtract, multiply, times, divide, share, group, sum, total, difference, plus, minus</p> <p>pound (£), penny/pence (p), note, coin, units of measurement and their abbreviations</p>
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Weekly homework includes children learning their times-tables and number bonds (differentiated to the numbers they are up to), which they are then tested on once a week

When HA are working on MA work without listening to my model a TA will check they understand it and are doing it correctly

	OBJECTIVES	TEACHING ACTIVITIES (20 mins)	INDEPENDENT WORK (20 mins)	Plenary / HOMEWORK (10 mins)	Success Criteria Must/should/could <i>I can:</i>	Evaluation
M	<p>Mental: Derive and recall all addition facts for each number to 20</p> <p>Main: Order whole numbers to at least 1000 and position them on a number line</p> <p>Order fractions</p> <p>A2001</p>	<p>Mental: Ask questions, using different vocabulary for addition on numbers up to 20. Children to write answers on whiteboards (WBs). HA can make up their own sums with the word as calculations to 20 are too easy.</p> <p>Main: HA attempt MA work without listening to my model. Use place value ITP available at http://www.edu.dudley.gov.uk/numeracy/ITPs/New%20shockwave%20ITPs/num_itp_placeValue_1_1.swf to demonstrate what each number in a 2 or 3 digit number represents. Go through a couple of examples of ordering numbers. Ask children to do some examples on their WBs LA start work With MA, on a number line show negative numbers and explain in relation to temperature on a thermometer Introduce vocabulary of tenths, hundredths and thousandths. Explain that each place you move to the right of the decimal place is worth less. Go through a couple of examples of ordering numbers with decimal places on WBs. Check HA were OK with MA work. Model for HA how to order fractions from smallest to largest by changing all fractions in a group to have the same denominator (bottom number) e.g. with the following fractions you would change them so that they all have a bottom number of 8. You can then use this to order them</p> $\frac{1}{2} \quad \frac{1}{8} \quad \frac{3}{4}$ <p>HA start work</p>	<p>LA – order 3-digit numbers from smallest to largest.</p> <p>MA – order numbers with decimal places and negative numbers from smallest to largest</p> <p>HA – order fractions from smallest to largest</p>	<p>On pupil WBs children come up with a set of numbers / fractions for their partner to order</p>	<p>M: order numbers up to 1,000</p> <p>S: order negative numbers and those with decimal places</p> <p>C: order fractions</p>	

<p>Tu</p>	<p>Mental: Derive and recall all addition and subtraction facts for each number to 20</p> <p>Main: Partition three-digit numbers into multiples of 100, 10 and 1</p> <p>Solve problems involving negative numbers, in context</p> <p>A2002</p>	<p>Mental: Ask questions, using different vocabulary for subtraction on numbers up to 20. Children to write answers on whiteboards (WBs). HA can make up their own calculations with the word as calculations to 20 are too easy.</p> <p>Main: HA do MA work without listening to my model LA and MA sit on carpet Recap place value and how to partition numbers. Explain how equals sign can be near beginning or end of a number sentence e.g. $30 + 7 = 37$ or $37 = 30 + 7$ Cover numbers where 0 is used as a place value holder e.g. 509, 1,004 LA start work For MA revise terms tenth, hundredth and thousandth. Model how to partition decimals e.g. $4.5 = 4 + 0.5$ For HA revise how to calculate with negative numbers by bridging through 0 on a number line e.g.</p>  <p>Encourage HA to draw number lines on their WBs to help with the calculations</p>	<p>LA – partition 3-digit numbers into T, U</p> <p>MA – partition numbers with decimal places</p> <p>HA – solve problems involving negative numbers, in context</p>	<p>In partners one pupil writes a number on their whiteboard. Their partner partitions it. Check each others' answers HA make up questions for each other on negative numbers using worksheet</p>	<p>M: partition 3-digit numbers into H, T, U</p> <p>S: partition numbers with decimal places</p> <p>C: solve problems involving negative numbers, in context</p>	
<p>W</p>	<p>Mental: Add or subtract mentally combinations of one-digit and two-digit numbers</p> <p>Main: Develop and use written methods to record, support or explain addition of two-digit and three-digit numbers</p> <p>A2003</p>	<p>Mental: Revise addition by partitioning horizontally with three questions: one with 2-digit numbers, one with 3-digit numbers and one with decimals to one place. Revise strategy of not changing the first number and partitioning the second number e.g. $45 + 22$ $45 + 20 = 65 + 2 = 67$</p> <p>Main: Introducing vertical addition Explain how this is useful because it allows us to line-up the hundreds, tens and units and do calculations with larger numbers and decimals. Quick model of how to do 1 question with these layouts: $372 + 247$:</p> <ul style="list-style-type: none"> • $300 + 70 + 2$ $+ 200 + 40 + 7$ $500 + 110 + 9 = 619$ • 372 $+247$ <u> 9</u> 110 500 <u>619</u> • 372 $+247$ <u> 9</u> 110 500 <u>619</u> <p>I will use all 3 methods for each question on the IWB so the children still think of the numbers in the formal algorithm as hundreds, tens and units and not as separate numbers</p>	<p>LA – use expanded vertical partitioning (1st example) only</p> <p>MA – use 1st layout for 4 questions, 2nd layout for 4 questions and 3rd layout for 4 questions</p> <p>HA – use formal layout only</p> <p>G + T – use formal layout with decimals places</p>	<p>Give children an addition to do on their pupil WB, which requires carrying. As they do it they need to explain to their partner what they are doing. Emphasise the need to use the language of carrying ten or carrying a hundred, not carrying the 1 when it is actually a 10 or 100. This should help reinforce their understanding of the process. Children swap over.</p>	<p>M: partition numbers vertically to add</p> <p>S: use the formal vertical algorithm to add</p> <p>C: add with numbers with decimal places</p>	

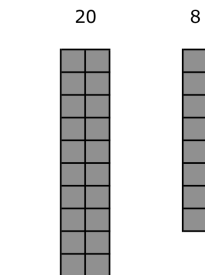
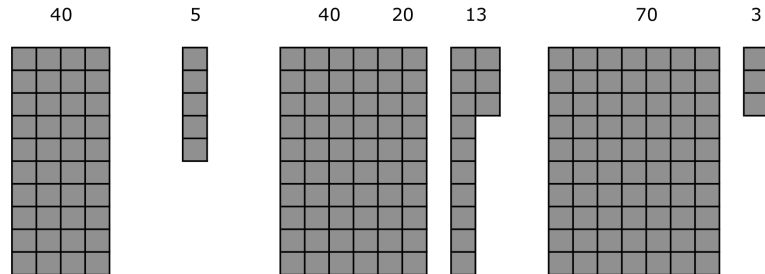
Some children will have been taught column addition already at home; if they think they know how to do column addition with the formal layout they can start on the HA work without listening to me anymore. With HA, who will be using the formal algorithm only, first few questions involve adding numbers with different numbers of digits e.g. $7 + 912$ as this will check if they understand how to align the numbers i.e. with the 7 above the 2.

HA questions will also check that they understand what to do when a column adds up to 10 e.g. with $238 + 465$ the 3 + the 6 + the carried 1 will give 10, so you put a 0 in the tens column and carry the 1 again:

$$\begin{array}{r} 238 \\ + 465 \\ \hline 703 \end{array}$$

For those who do not think they already know how to do column addition correctly, do some more examples with the first layout only.

Represent the calculation using tens and units blocks e.g. $45 + 28$ below – when the units column gets to more than ten, there isn't enough space in the units column so the ten needs to 'move next door' to the tens

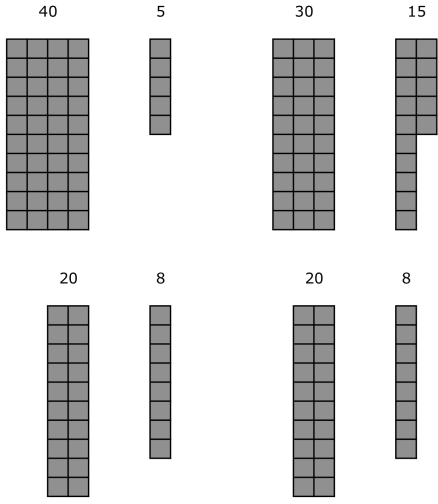


LA start work using first expanded layout only and representing calculations with tens and unit blocks.

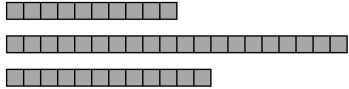
For MA do some more examples with all 3 layouts, to help them see how the first 2 methods are contracted down in the formal algorithm.

Emphasise how with vertical addition you need to start on the right-hand side, not on the left hand side as you do with horizontal partitioning. Go through answers with those doing HA work and they do any corrections before moving on to column addition with decimals – emphasise it is the same thing, the key point is to put the numbers in the right columns

TH	<p>Mental: Add or subtract mentally combinations of one-digit and two-digit numbers</p> <p>Main: Develop and use written methods to record, support or explain subtraction of two-digit and three-digit numbers</p> <p>A2004</p>	<p>Mental: Revise subtraction by partitioning horizontally, with three questions: one with 2-digit numbers, one with 3-digit number and one with decimals to one place. Revise strategy of not changing the first number and partitioning the second number e.g. $45 - 22$ $45 - 20 = 25 - 2 = 23$</p> <p>Main: Introduce vertical subtraction Model how to do the questions with this layout: $448 - 267$:</p> <ul style="list-style-type: none"> $300 + 140$ $400 + 40 + 8$ $- 200 + 60 + 7$ $100 + 80 + 1 = 181$ $^3 4^1 48$ $- \underline{267}$ 181 <p>Emphasise how in the expanded version the addition signs in between the numbers do not show what type of calculation you are doing – this is indicated by the subtraction sign Model how to do vertical subtraction with top numbers that have 0s in them e.g. $807 - 645$ I will use both methods for each question on the IWB so the children still think of the numbers in the formal algorithm as hundreds, tens and units and not as separate numbers Some children will have been taught column subtraction already at home; if they think they know how to do column subtraction with the formal layout they can start on the HA work without listening to me anymore. With HA, who will be using the formal algorithm only, first few questions involve subtracting numbers with different numbers of digits e.g. $912 - 7$ as this will check if they understand how to align the numbers i.e. with the 7 under the 2. HA questions will also check that they understand what to do when there is a 0 in the top number e.g. with $208 - 165$ you need to take a 100 from the 200 and make it 10 - 6</p> <ul style="list-style-type: none"> $^1 2^1 08$ $- \underline{165}$ 43 <p>For those who do not think they already know how to do column subtraction correctly, do some more examples with the first layout only. Represent the calculation using tens and units blocks e.g. $45 - 28$ below – I can't take 8 away from 5 so I need to go next door to get a 10 to make 15</p>	<p>LA – use expanded vertical partitioning (1st example),</p> <p>MA – 6 questions using 1st expanded method and 6 questions using 2nd formal method</p> <p>HA – use formal algorithm only</p> <p>G+T – use formal algorithm with decimals</p>	<p>Give children a subtraction to do on their pupil WB, which requires 'taking'. As they do it they need to explain to their partner what they are doing. Emphasise the need to use the language of taking ten or taking a hundred, not taking the 1 when it is actually a 10 or 100. This should help reinforce their understanding of the process. Children swap over.</p>	<p>M: partition numbers vertically to subtract</p> <p>S: use the formal vertical algorithm to subtract</p> <p>C: subtract with numbers with decimal places</p>	
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		 <p>LA start work using first expanded layout only and representing calculations with tens and unit blocks. For MA do some more examples with both layouts, to help them see how the first method is contracted down in the formal algorithm. Emphasise how with vertical subtraction you need to start on the right-hand side, not on the left hand side as you do with horizontal partitioning Go through answers with those doing HA work and they do any corrections before moving on to column subtraction with decimals – emphasise it is the same thing, the key point is to put the numbers in the right columns</p>				
F	<p>Mental: Add or subtract mentally combinations of one-digit and two-digit numbers</p> <p>Main: Develop and use written methods to record, support or explain addition and subtraction of two-digit and three-digit numbers</p> <p>A2005</p>	<p>Mental: Revise addition and subtraction by partitioning horizontally, with three questions: one with 2-digit numbers, one with 3-digit numbers and one with decimals to one place.</p> <p>Main: Model an addition and a subtraction using methods from the previous 2 lessons (both expanded and formal) As go through the examples, revise the key teaching points from previous 2 lessons:</p> <ul style="list-style-type: none"> • putting the numbers in the correct columns • starting on the right hand side, not the left hand side • when to carry a ten or hundred in addition • need to take a ten or hundred in subtractions where one of the bottom numbers is bigger than the top number • check if the question is an addition or subtraction, and do the appropriate calculation <p>Give children a choice of how to set out their work: with an expanded version or with a formal, contracted layout LA still to use an expanded layout only and represent calculations with tens and unit blocks</p>	<p>LA – use expanded vertical partitioning to add and subtract</p> <p>MA – use either expanded vertical partitioning or formal algorithm to add and subtract</p> <p>HA – use formal algorithm only to add and subtract</p> <p>G+T - use formal algorithm only to add and subtract, with decimals</p>	<p>Give children an addition to do on their pupil WB, which requires carrying and a subtraction that requires 'taking' a 10 or 100. As they do it they need to explain to their partner what they are doing. Emphasise the need to use the language of carrying / 'taking' ten or carrying a hundred, not carrying the 1 when it is actually a 10 or 100. This should help reinforce their understanding of the process. Children swap over.</p>	<p>M: partition numbers vertically to add and subtract</p> <p>S: use the formal vertical algorithm to add and subtract</p> <p>C: add and subtract with numbers with decimal places</p>	

	OBJECTIVES	TEACHING ACTIVITIES (20 mins)	INDEPENDENT WORK (20 mins)	Success criteria	Plenary / HOMEWORK (10 mins)	Evaluation												
M	<p>Mental: Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing</p> <p>Main: Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect</p> <p>A2006</p>	<p>Mental: Display several addition calculations on the IWB; some best done mentally, some best done using column addition. On pupil WBs children calculate, showing their strategy. Explain to their partner why they chose the strategy they used. Discuss as a class how we could work out each question</p> <p>Main: Model how to multiply and divide a digit by 10, 100 or 1,000. To MULTIPLY by: 10 move the numbers <u>1</u> place to the left 100 move the numbers <u>2</u> places to the left 1,000 move the numbers <u>3</u> places to the left To DIVIDE by: 10 move the numbers <u>1</u> place to the RIGHT 100 move the numbers <u>2</u> places to the RIGHT 1,000 move the numbers <u>3</u> places to the RIGHT</p> <table border="1" style="margin-left:auto; margin-right:auto; border-collapse: collapse; text-align:center;"> <tr> <td style="width:15%; font-size:small;">Th</td> <td style="width:15%; font-size:small;">H</td> <td style="width:15%; font-size:small;">T</td> <td style="width:15%; font-size:small;">U</td> <td style="width:15%; font-size:small;">tenths</td> <td style="width:15%; font-size:small;">hundredths</td> </tr> <tr> <td style="height:20px;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Th	H	T	U	tenths	hundredths							<p>LA – Multiply and divide 1-digit and 2-digit numbers by 10 or 100</p> <p>MA – as for LA, but also with numbers to one decimal place</p> <p>HA – as for MA, but also multiply and divide by 1,000 and with numbers to 2 or 3 decimal places</p>	<p>M: multiply and divide by 10 and 100</p> <p>S: multiply and divide by 1,000</p> <p>C: multiply and divide by 10, 100 and 1,000 with calculations requiring decimal places</p>	<p>I write a number on the IWB. On pupil WBs children multiply and divide it by 10, 100 or 1,000 depending and check each other's answers, discussing any differences</p>	
Th	H	T	U	tenths	hundredths													
Tu	<p>Mental: Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing</p> <p>Main: Round two-digit or three-digit numbers to the nearest 10 or 100</p> <p>A2007</p>	<p>Mental: Display several subtraction calculations on the IWB; some best done mentally, some best done using column subtraction. On pupil WBs children calculate, showing their strategy. Explain to their partner why they chose the strategy they used. Discuss as a class how we could work out each question</p> <p>Main: Emphasise the importance of reading whether you are asked to round to the nearest 10, 100 or 1,000. HA start work without listening to my model Explain which numbers are 10s (those that end in one zero) i.e. 10, 20, 30 and so on, which numbers are 100s (those that end in two zeros) e.g. 100, 200, 300 and so on. Model how it is useful to find the halfway point between 2 numbers on a number line and then see which side of the halfway point a number falls on e.g. when rounding 38 to the nearest 10:</p> <table border="1" style="margin-left:auto; margin-right:auto; border-collapse: collapse; text-align:center;"> <tr> <td style="width:30%; border-bottom: 1px solid black;">30</td> <td style="width:40%; border-bottom: 1px solid black;"></td> <td style="width:30%; border-bottom: 1px solid black;">40</td> </tr> <tr> <td></td> <td style="text-align:center;"> </td> <td></td> </tr> <tr> <td></td> <td style="text-align:center;">35</td> <td></td> </tr> </table>	30		40					35		<p>LA – round 2-digit numbers to the nearest 10 and 3-digit numbers to the nearest 100,</p> <p>MA – as above, but also round 3-digit numbers to the nearest 10</p> <p>HA – as above, but also round 4-digit numbers to the nearest 100 and nearest 10</p> <p>Ext – round numbers with decimal places</p>	<p>M: know that numbers can be rounded up or down and calculations estimated</p> <p>S: round numbers up or down correctly</p> <p>C: round numbers with decimal places up or down correctly</p>	<p>In pairs children give each other numbers to round and say whether they need to be rounded to the nearest 10, 100, 1,000 or 1 or 2 decimal places.</p>				
30		40																
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		<p>Model also with tens and units blocks, to show whether a number is closer to the next 10 or the previous 10 e.g. when rounding 12 to the nearest 10 you can see 12 is closer to 10 than to 20</p>  <p>Explain convention of rounding up to the nearest 10 from numbers that end in 5 and up to the nearest 100 from numbers that end in 50. Check HA were OK with rounding to nearest 10, 100 and 1,000. Explain language of units as whole numbers, tenths as 1 decimal place and hundredths as 2 decimal places. Model how to round to the nearest whole number, 1 dp or 2 dps.</p>				
W	<p>Mental: Partition three-digit numbers into multiples of 100, 10 and 1 in different ways</p> <p>Main: Give estimates for the sums and differences of two-digit or three-digit numbers</p> <p>A2008</p>	<p>Mental: Model for children how to partition numbers in different ways: LA – partition 3-digit numbers into T, U HA – partition numbers with decimal places</p> <p>Main: Revise how to round numbers from yesterday. Explain that estimating allows us to get a 'rough' answer and to check our calculations. Model how to estimate by slightly changing the numbers in a calculation to make them easier to work with e.g. $48 + 23$ could be estimated as $50 + 20$.</p>	<p>LA – estimate answers by rounding numbers in calculations to the nearest 10 and adding or subtracting them</p> <p>MA – estimate answers by rounding numbers in calculations to the nearest 10 or 100 and adding, subtracting, multiplying or dividing them</p> <p>HA – estimate answers by rounding numbers with decimal places in calculations and adding, subtracting, multiplying or dividing them</p>	<p>M: know that estimate means to get a rough answer</p> <p>S: round numbers to estimate</p> <p>C: estimate calculations with decimal places</p>	<p>Put several questions on the WB. Children use estimation on their pupil WBs to check if they could be right or are clearly wrong</p>	
Th	<p>Mental: Revise adding, subtracting, multiplying, rounding, multiplying and dividing by 10, 100 or 1,000 and coordinates</p> <p>Main: Recognise what operation different words stand for e.g. difference means take away</p> <p>A2009</p>	<p>Mental: Revise how we read coordinates by going along the corridor then up or down the stairs Write topics of Revise adding, subtracting, multiplying, rounding, multiplying and dividing by 10, 100 or 1,000 on board and explain that children need to come up with questions for each other to answer using the coordinates grid</p> <p>Main: Model how to answer questions which ask you to:</p> <ul style="list-style-type: none"> • count on from one number crossing a hundred barrier • count back from one number crossing a hundred barrier • find double a number • find half a number • find multiples • find factors • find squares • find square roots <p>Remind children of the display that shows what operation different vocabulary stands for</p>	<p>Answer questions on the four number operations with the operations and numbers written in words</p> <p>LA – +and – 1/2-digit numbers. X and ÷ by 2, 5, 10</p> <p>MA – +and – 2-digit numbers. X and ÷ by 3, 4, 6</p> <p>HA – +and – 3-digit numbers. X and ÷ by 7, 8, 9</p>	<p>Answer questions with</p> <p>M: basic vocabulary e.g. add, subtract etc</p> <p>S: more advanced vocabulary e.g. product</p> <p>C: even more advanced vocabulary e.g. factor</p>	<p>In partners children take it in turns to make up questions for each other using the vocabulary from their sheet</p>	

F	<p>Mental: Revise adding, subtracting, multiplying, rounding, multiplying and dividing by 10, 100 or 1,000 and coordinates</p> <p>Main: Recognise multiples of 2, 5 or 10 up to 1000</p> <p>Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing</p> <p>A2010</p>	<p>Mental: Revise how we read coordinates by going along the corridor then up or down the stairs Write topics of Revise adding, subtracting, multiplying, rounding, multiplying and dividing by 10, 100 or 1,000 on board and explain that children need to come up with questions for each other to answer using the coordinates grid</p> <p>Main: Model how to solve a couple of 'Which multiple am I?' questions by finding the potential answers to each clue and then narrowing down the choices e.g. I am a multiple of 2. I am less than 10, so could be 2,4,6,8 I am not half of 12, so could be 2, 4 or 8 I am not quarter of 8, so could be 4 or 8 I am not double 4, so has to be 4 What number am I? 4</p>	<p>LA – colour in multiples of 2, 5 and 10 and write a rule about how to find each one</p> <p>MA – Which number am I? Given clues using vocabulary like product, difference, half etc to work out the multiple, with multiples of 2, 3, 4, 5 and 10</p> <p>HA – as MA, but also multiples of 6, 7, 8 and 9</p> <p>Ext – make up their own which multiple am I? questions</p>	<p>M: know what a multiple is</p> <p>S: decipher numbers that are multiples from clues</p> <p>C: create their own series of clues for others to investigate</p>	<p>Children make up their own 'Which multiple am I?' question for their partner to do</p>	
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