

Unit 10

Multiplication and division 2

Five daily lessons

National
Numeracy Strategy

Year 4
Summer term

Unit Objectives Year 4

- Develop and refine written methods for $TU \times U$, $TU \div U$.
- Begin to know: multiplication facts for 6, 7, 8 and 9 times tables.
- **Derive quickly division facts to 2, 3, 4, 5 and 10 times tables.**
- Use known number facts and place value to multiply and divide integers, including by 10 and then 100 (whole-number answers).

Pages 66, 68

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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:

- Resource sheet 10.1
- OHT 10.1
- Self-assessment sheet 10.1
- Homework problem: Teacher guidance
- Whiteboards
- Number fans
- Large 2–10 digit cards
- Counting stick
- 18 cubes in a bag
- Place value chart
- Dice 10–90
- Counters

Year 3

Link Objectives

Year 5

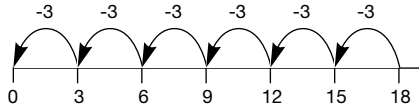
- **Know by heart multiplication facts for the 2, 5 and 10 times tables.** Begin to know the 3 and 4 times tables.
- Derive quickly: division facts corresponding to the 2, 5 and 10 times tables.
- Use known number facts and place value to carry out mentally simple multiplications and divisions.
- Say or write a division statement corresponding to a given multiplication statement.

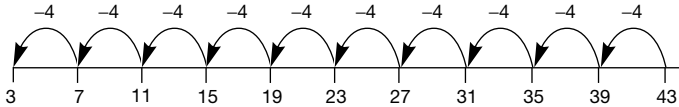
- **Extend written methods to:**
short multiplication of HTU or U.t by U;
long multiplication of TU by TU;
short division of HTU by U (with integer remainder).
- **Know by heart all multiplication facts up to 10×10 .**
- Continue to derive quickly division facts corresponding to tables up to 10×10 .

(Key objectives in bold)

Planning sheet	Day One	Unit 10 <i>Multiplication and division 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Derive quickly division facts corresponding to the 2, 3, 4, 5 and 10 times tables.</p> <p>VOCABULARY division facts</p> <p>RESOURCES Number fans</p>	<ul style="list-style-type: none"> Get the class to recite the 2, 3, 4, 5 and 10 times tables. Stop at various points, e.g. $8 \times 4 = 32$. <div>Q $8 \times 4 = 32$, what other facts can we make?</div> <p>Make sure the following facts are included:</p> <p>$4 \times 8 = 32$ $32 \div 4 = 8$ $32 \div 8 = 4$</p> <p>Collect answers and record them on the board. Make sure the children can read the facts correctly.</p> <ul style="list-style-type: none"> Carry out some quick fire division calculations covering each of the 2, 3, 4, 5 and 10 times tables where the children show their answers using number fans. Reinforce the relationship between division and multiplication. <p>Involve the class by asking one child to ask another child a question using multiplication and division facts, e.g.</p> <div>Q If you know $4 \times 9 = 36$, what else do you know?</div> <div>Q If you know $40 \div 5 = 8$, what else do you know?</div>	<p>Use known number facts and place value to multiply and divide integers, including by 10 and then 100 (whole number answers).</p> <p>RESOURCES Place value chart Resource sheet 10.1 Self-assessment sheet 10.1 Dice 10–90 Counters</p>	<ul style="list-style-type: none"> Write 10 on the board. <div>Q What number is 10 times bigger than 10?</div> <div>Q What number is 100 times bigger than 10?</div> <div>Q How would we record those operations?</div> <p>Write 1000 on the board.</p> <div>Q What number is 10 times smaller than 1000?</div> <div>Q What number is 100 times smaller than 1000?</div> <div>Q How would you record those operations?</div> <ul style="list-style-type: none"> Using a place value chart demonstrate what happens when you multiply and divide by 10 and 100. Give the children quick fire questions, multiplying and dividing by 10 and 100. The children can respond with number fans. Give the children Resource sheet 10.1 and 10–90 dice. The children play the game in pairs. The aim of the game is to cover five numbers. The first child rolls the dice and either multiplies or divides by 10 or 100 and covers the number on the board. 	<ul style="list-style-type: none"> Write 7000 on the board. Ask the children to write a spider diagram of multiplication and division by 10 and 100. <div>Q What happens to the digit 7 in each calculation?</div> <div>Q Who can tell me a rule for multiplying and dividing by 100?</div> <p>ASSESSMENT – Hand out Self-assessment sheet 10.1, allow the children time to complete and discuss and decide on a target.</p> <div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Multiply a two- or three-digit number by 10 or 100; Divide a four-digit multiple of 1000 by 10 or 100. <p>(Refer to supplement of examples, section 6, page 64.)</p> </div>

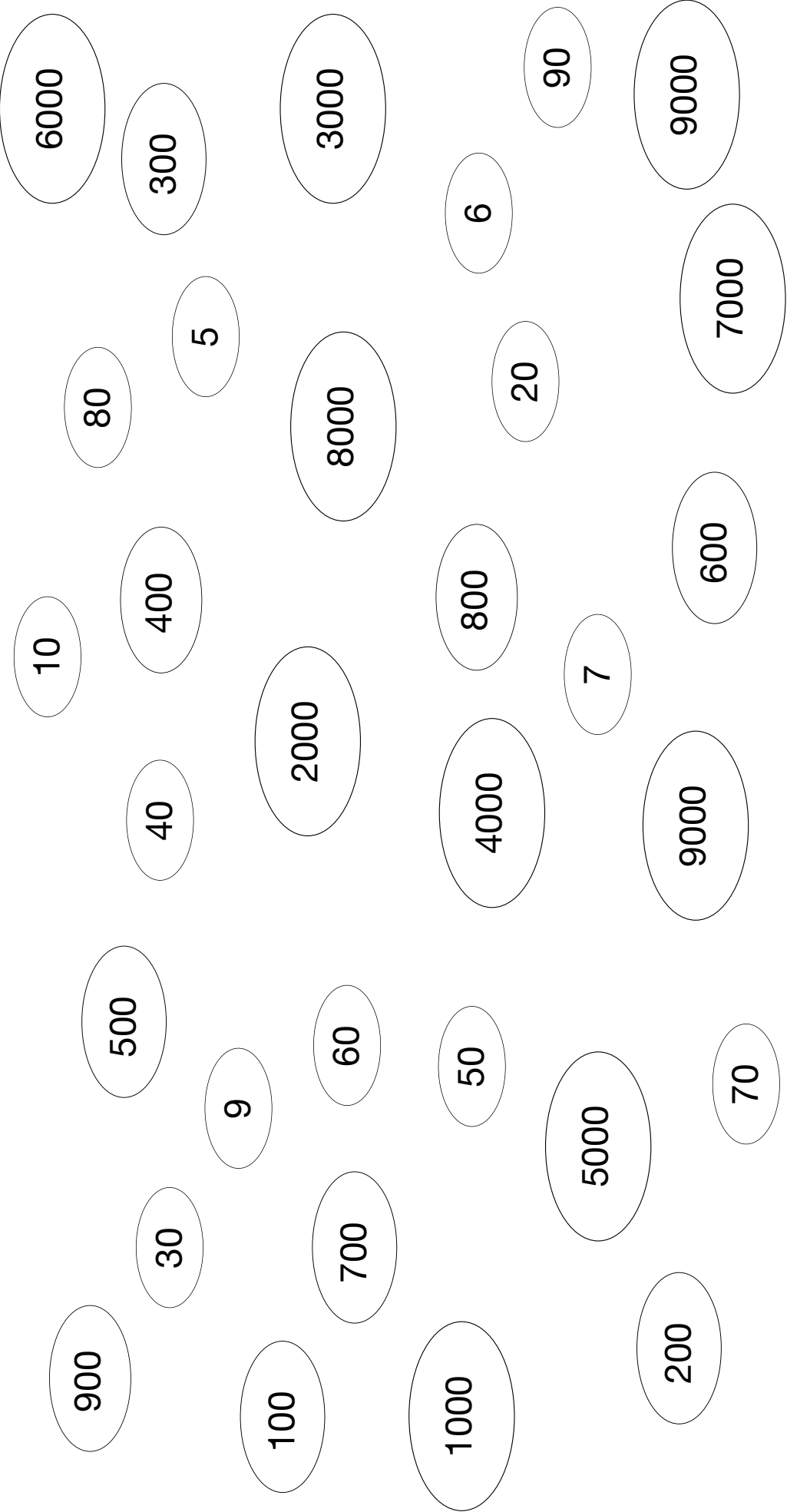
Planning sheet	Day Two	Unit 10 <i>Multiplication and division 2</i>		Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching			Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions	
Begin to know multiplication facts for 6, 7, 8 and 9 times table. 					

Planning sheet	Day Three (page 1 of 2)	Unit 10 <i>Multiplication and division 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Recall multiplication facts and derive quickly division facts corresponding to 3, 4, 5 times tables.</p> <p>VOCABULARY divides into divided by</p> <p>RESOURCES Counting stick</p>	<ul style="list-style-type: none"> Get the class to recite multiplication tables for: $\times 3, \times 4, \times 5$. Using a counting stick point to the markers as the class counts up in steps of 4. Repeat for 3s and 5s. Point to a marker on the stick. <div>Q If we are counting 3s, what number will this marker represent?</div> <p>Confirm by counting up in 3s. Repeat using other markers and step sizes.</p> <ul style="list-style-type: none"> Say you are counting up in 4s. Point to a marker on the stick. <div>Q What number will this marker represent? How many 4s make up this number? How many 4s divide into this number?</div> <p>Confirm the number by counting up in 4s. Remind the children that the number of steps represents the number of 4s and the number of times 4 divides into the number. Repeat for other marks and step sizes.</p>	<p>Develop and refine written methods for $TU \div U$.</p> <p>VOCABULARY how many groups of ...in ...? share remainder divided by divisor inverse</p> <p>RESOURCES 18 cubes in a bag Counting stick</p>	<ul style="list-style-type: none"> Show a bag containing 18 cubes. Say you want to divide the cubes into piles of three but do not say how many there are in the bag. <div>Q How could we do this?</div> <p>Collect responses.</p> <p>Pick out groups of three cubes to see how many 3s there are in the bag.</p> <div>Q How many groups of three did we find?</div> <div>Q How many cubes were in the bag?</div> <p>Establish that there were six groups of three, and a total of 18 cubes. Record on the board: $18 \div 3 = 6$, and read the statement with the class, e.g. 18 divided by 3 is 6.</p> <ul style="list-style-type: none"> Relate the method of grouping into 3s to the counting stick, count up in 3s to 18 and back in 3s from 18 to 0. Establish that there are six steps of 3 from 18 to 0. Record on the board using the empty number line:  <p>Emphasise that we can subtract 3 from 18 six times.</p> <div>Q Suppose there have been 15 cubes in the bag, what would our answer have been?</div> <p>Confirm that the answer would have been 5, record $15 \div 3 = 5$ and read it with the children.</p> <ul style="list-style-type: none"> Show the bag containing 17 cubes. Say you want to divide the cubes into piles of 5. <div>Q How do we do this division?</div> <p>Take out a group of five cubes. Repeat twice more.</p> <div>Q How many groups of five cubes have we removed so far?</div> <p>Establish that three groups of five cubes have been removed.</p>	<ul style="list-style-type: none"> Write on the board: $38 \div 5 = 7 \text{ R } 3$ Ask the children to read and interpret this. <div>Q How can we check the statement is correct?</div> <p>Remind them that they can use multiplication to find 7×5 and then add the remainder 3.</p> <ul style="list-style-type: none"> Write on the board: $27 \div 2 = 11 \text{ R } 3$ $29 \div 3 = 9 \text{ R } 1$ $29 \div 4 = 7 \text{ R } 1$ $49 \div 5 = 10 \text{ R } 1$ $101 \div 10 = 10 \text{ R } 10$ <div>Q Are any of these statements incorrect?</div> <p>Collect answers to each statement. Agree that only one statement is correct. Encourage the children to explain their reasoning.</p> <div>By the end of the lesson the children should be able to:</div> <ul style="list-style-type: none"> Derive quickly the corresponding division facts for 3, 4 and 5 times table. <p>(Refer to supplement of examples, section 6, pages 58 and 66.)</p>

Planning sheet	Day Three (page 2 of 2)	Unit 10 <i>Multiplication and division 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Teaching Activities		Teaching Activities/ Focus Questions
		<div>Q How many cubes have we removed?</div> <p>Agree that $3 \times 5 = 15$ cubes have been removed. Show the class that there are two cubes left in the bag. Say there are two cubes remaining.</p> <div>Q How many cubes were in the bag at the start?</div> <p>Agree that the bag contained 17 cubes.</p> <div>Q What division statement can we record?</div> <p>Record $17 \div 5 = 3 \text{ R } 2$</p> <p>Explain that the R means remainder and read the statement as 17 divided by 5 is 3 remainder 2.</p> <ul style="list-style-type: none"> Use the empty number line with the children to establish that $16 \div 3 = 5 \text{ R } 1$. Ask the children to carry out division calculations using a number line, e.g. <div>Q How many 3s are in 24?</div> <div>Q What is $26 \div 5$?</div> <p>Collect answers and discuss the children's methods. Remind the children that they have been subtracting the number they are dividing by until there is nothing left to subtract or there is a remainder which is too small to subtract from.</p> <ul style="list-style-type: none"> On the board write $43 \div 10$. Work through this example with the class using the number line:  <p>Emphasise the repeated subtraction of 4 and agree that $43 \div 4 = 10 \text{ R } 3$. Say that we can think of the subtracting 4 as removing single chunks of 4 from 43 until no more chunks can be removed. Show the children how to record this another way:</p>		<div>43</div> <div>$\begin{array}{r} 43 \\ - 4 \\ \hline 39 \\ - 4 \\ \hline 35 \\ - 4 \\ \hline 31 \\ - 4 \\ \hline 27 \\ - 4 \\ \hline 23 \\ - 4 \\ \hline 19 \end{array}$ (1 × 4)</div> <div>19</div> <div>$\begin{array}{r} 19 \\ - 4 \\ \hline 15 \\ - 4 \\ \hline 11 \\ - 4 \\ \hline 7 \\ - 4 \\ \hline 3 \end{array}$ (1 × 4)</div> <p>Relate the repeated subtraction on the number line to the single chunks represented in this column method. Remind children that they know $4 \times 10 = 40$ from their tables work so we could use this knowledge to record:</p> <div>$\begin{array}{r} 43 \\ - 40 \\ \hline 3 \end{array}$ (10 × 4) R</div> <p>This time we have removed a bigger chunk of 40 in one step and get the remainder (R) of 3 straight away. Emphasise that using tables knowledge is very helpful and quick.</p> <ul style="list-style-type: none"> Write on the board $54 \div 8$. <div>Q How can we do this division?</div> <p>Discuss the number line and chunking methods.</p> <div>Q What multiplication fact can we use?</div> <p>Agree known facts, e.g. $5 \times 8 = 40$. Model on the board.</p> <div>$\begin{array}{r} 54 \\ - 40 \\ \hline 14 \\ - 8 \\ \hline 6 \end{array}$ (5 × 8) R</div> <div>$\begin{array}{r} 14 \\ - 8 \\ \hline 6 \end{array}$ (1 × 8) R</div> <ul style="list-style-type: none"> Write on the board $54 \div 8 = 6 \text{ R } 6$. Make sure the children can read and interpret this statement. With the children, work through $73 \div 5$ and $65 \div 4$ using chunking. Record the answers as $73 \div 5 = 14 \text{ R } 3$ and $65 \div 4 = 16 \text{ R } 1$. Set the children other examples to do involving division by 2, 3, 4, 5 and 10. Include some with no remainders, e.g. $36 \div 4$. Collect answers and discuss the children's methods. Explain that we can write the answer to $36 \div 4$ as $36 \div 4 = 9 \text{ R } 0$ but we usually write $36 \div 4 = 9$.

Planning sheet	Day Four	Unit 10 <i>Multiplication and division 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Begin to know multiplication facts for the 6 and 7 times tables.</p> <p>RESOURCES Counting stick</p>	<ul style="list-style-type: none"> With the counting stick, get children to count forwards in 6s. Repeat and at various markers stop. <div>Q What multiplication fact from the 6 times table relates to this mark?</div> <p>Record these on the board, out of sequence. When a number of statements for the 6 times table have been recorded ask:</p> <div>Q Can we put these statements in order and add the missing statements to help us remember them?</div> <p>With the class build up the complete multiplication table in order from $1 \times 6 = 6$ to $10 \times 6 = 60$. Get the class to read each statement twice. Remove any three statements and get the class to chant the table; remove another three statements and get the class to chant the table again. Finally remove all the statements and have the class chant the table.</p> <ul style="list-style-type: none"> Repeat for the 7 times table. 	<ul style="list-style-type: none"> Develop and refine written methods for $TU \div U$. <p>VOCABULARY chunking remainder</p>	<ul style="list-style-type: none"> Write on the board: $85 \div 6$. <div>Q How could we do this calculation?</div> <p>Collect responses. Remind the children that they could use a number line and keep subtracting 6 but this would take a long time.</p> <div>Q How could we use our knowledge of the 6 times table?</div> <ul style="list-style-type: none"> Remind the children that when we use chunking, we try to find big chunks to take away. <div>Q What is 10×6?</div> <p>Agree it is 60 and record:</p> $\begin{array}{r} 85 \\ - 60 \\ \hline 25 \end{array} \quad (10 \times 6)$ <div>Q What number fact in the 6 times table is close to 25?</div> <p>Work through the table and establish that $4 \times 6 = 24$ and $5 \times 6 = 30$, which is too big. Continue the calculation:</p> $\begin{array}{r} 85 \\ - 60 \\ \hline 25 \\ - 24 \\ \hline 1 \end{array} \quad \begin{array}{l} (10 \times 6) \\ (4 \times 6) \end{array}$ <p>Explain that the calculation shows that we have subtracted ten 6s (60) and four 6s (24) with a remainder of 1. Altogether we have subtracted 14 6s. Record: $85 \div 6 = 14 \text{ R } 1$.</p> <ul style="list-style-type: none"> Work through $93 \div 7$ using chunking. Emphasise the method of recording, the number of 7s that have been subtracted and the remainder. Record: $93 \div 7 = 13 \text{ R } 2$ <p>Ensure the children can interpret this statement.</p> <ul style="list-style-type: none"> Set the children division calculations involving division by 5, 6 and 7. <p>Collect answers and discuss methods. Correct any errors and misunderstandings.</p>	<ul style="list-style-type: none"> On the board write: $17 \div 4$; $17 \div 5$; $17 \div 7$ and ask the children to work them out. <div>Q What do you notice about the remainder?</div> <p>Collect answers and record: $17 \div 4 = 4 \text{ R } 1$; $17 \div 5 = 3 \text{ R } 2$; $17 \div 7 = 2 \text{ R } 3$.</p> <p>Identify that the remainder is 1 when 17 is divided by 4, 2 when divided by 5, 3 when divided by 7.</p> <p>HOMEWORK –</p> <ul style="list-style-type: none"> Explain to the children that you know a two-digit number less than 30 that divided by 2 has remainder 1, divided by 5 has remainder 2 and divided by 6 has remainder 3. <div>Q Can you find the number?</div> <p>Say that you know of another two-digit number that when divided by 4 has remainder 1, when divided by 5 has remainder 1 and when divided by 6 has remainder 1.</p> <p>Tell the children that they have to find the answer for homework and provide written proof.</p> <div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Know multiplication facts for the 6 and 7 times tables; Begin to develop written methods for division ($TU \div U$). <p>(Refer to supplement of examples, section 6, page 66.)</p> </div>

Planning sheet	Day Five	Unit 10 <i>Multiplication and division 2</i>	Term: <i>Summer</i>	Year Group: 4
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities/Focus Questions
<p>Begin to know multiplication facts for the 8 and 9 times tables.</p> <p>RESOURCES Counting stick</p>	<ul style="list-style-type: none"> With the counting stick, get the children to count forwards in 8s. Repeat and at various marks stop. <div>Q What multiplication fact from the 8 times table relates to this mark?</div> <p>Record these on the board, out of sequence. When a number of statements for the 8 times table are recorded, ask:</p> <div>Q Can we put these statements in order and add the missing statements to help us remember them?</div> <p>With the class build up the complete multiplication table in order from $1 \times 8 = 8$ to $10 \times 8 = 80$. Get the class to read each statement twice. Remove any three statements and get the class to chant the tables; remove another three statements and get the class to chant the tables again. Finally, remove all the statements and have the class chant the table.</p> <ul style="list-style-type: none"> Repeat for the 9 times table. 	<p>Develop and refine written methods for $TU \times U$, $TU \div U$.</p> <p>VOCABULARY estimate multiply multiplication multiplied by divisor inverse factor</p> <p>RESOURCES OHT 10.1 Homework problem: Teacher guidance Self-assessment sheet 10.1</p>	<ul style="list-style-type: none"> Discuss the homework set on day 4. Remind the children that this week they have been working on written methods for multiplication (the grid method) and for division (chunking). Ask the children to use these methods to work out: 36×7 and $73 \div 5$. Collect answers and with the children work through the two calculations. Emphasise the importance of knowing their tables and setting the calculation out carefully. Show OHT 10.1. Ask the children to read question 1. <div>Q What calculation do we need to do to answer this question?</div> <p>Encourage the children to imagine one pack of 16 cards (illustrate with an envelope say) and the counting out of seven such packs.</p> <div>Q Will we have more than 16 cards altogether? How many times more?</div> <p>Establish that there will be more than 16 cards, and the calculation is 16×7. Ask the children to do the calculation.</p> <div>Q How many cards are there altogether?</div> <p>Establish that there are 112 cards in seven packs and record this on the board.</p> <ul style="list-style-type: none"> Ask the children to read question 2. <div>Q What calculation do we need to do to answer this question?</div> <p>Encourage the children to imagine 80 biscuits being put into packs of five.</p> <div>Q Will we have fewer or more packs than biscuits?</div> <p>Establish that each time we are putting biscuits into a pack there are five less biscuits and we need to find how many 5s there are in 80, so the calculation is $80 \div 5$. Ask the children to do the calculation.</p> <div>Q How many packs are there altogether?</div> <p>Establish that Angela must buy 16 packs of five biscuits and record this on the board.</p> <p>Ask the children to read the other questions and in pairs to decide on the calculation they need to do. Emphasise that you want the answer as a statement similar to:</p> <ol style="list-style-type: none"> There are 112 cards in seven packs. Angela must buy 16 packs of five biscuits. <p>Collect answers and discuss the children's methods. Correct any errors or misunderstandings.</p>	<p>ASSESSMENT – Give out Self-assessment sheet 10.1. Ask the children to complete the second question and explain their answer to a friend. Ask them to write their target.</p> <div> <p>By the end of the lesson the children should be able to:</p> <ul style="list-style-type: none"> Use pencil and paper methods to support, record and explain calculations achieving consistent accuracy; Discuss and compare methods. <p>(Refer to supplement of examples, section 6, page 66.)</p> </div>



1. There are 16 invitation cards in a pack. How many invitation cards are there in seven packs?
2. There are five chocolate biscuits in a pack. How many packs must Angela buy to get 80 biscuits for a party?
3. Tom has 56 stickers. He can stick four to a page. How many pages can he fill?
4. A box has 24 candles. How many candles are needed to fill eight boxes?
5. Chairs are stacked away in sixes. For a meeting 34 stacks of chairs are used. How many chairs are used for the meeting?
6. There are six eggs in a box. A café serves 42 eggs at breakfast. How many boxes of eggs does the café use?

Unit 10 Year 4 (Summer Term)

Homework problem: Teacher guidance

The answer is 61 (4, 5, 6 are factors of 60). The proof could be shown by doing a written method
e.g. $61 \div 4 = 15 \text{ R } 1$ $61 \div 5 = 12 \text{ R } 1$ $61 \div 6 = 10 \text{ R } 1$

Children might use different approaches, but any that involve listing the multiples +1 are acceptable. They might work through logically crossing off numbers that cannot be the answer, e.g. even numbers. A hundred square may be a useful resource for some to give them an image.

A child might reason that if it is odd it can only be a multiple of 10 +1. (Because multiples of 5 +1 are even). Encourage this, do not insist on their listing the other multiples. They can then match the other multiples near these.

11,	21,	31,	41,	51,	61,	71,	81,	91	5s
	21		41		61		81		4s
		31			61			91	6s

Encourage the children to explain orally their thinking.

Extension:

Is this the only answer less than 100?

Are there any answers above 100?

Can you find a link between all the other answers?

(multiples of 60)

My Mathematics by

Multiply and divide
800 by 10 and 100.

How I did it

Explain to a friend how you did it

I did this
on my own ☐

together ☐

There are 64 children
in the class.
How many teams of six
children can be made?
How many children will
be left over?

How I did it

Explain to a friend how you did it

I did this
on my own ☐

together ☐

A remainder is

My next target:
