

Unit 6 Part 2

Using a calculator

Three daily lessons

National
Numeracy Strategy

Year 6
Autumn term

Unit Objectives

Year 6

- Develop calculator skills and use a calculator effectively.
- Check with the inverse operations when using a calculator.
- Check with an equivalent calculation.

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Link Objectives

Year 5

- Develop calculator skills and use a calculator effectively.
- Check with the inverse operations when using a calculator.
- Check with an equivalent calculation.

Year 7

- Carry out calculations with more than one step using brackets and the memory.

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:

- Activity sheet 6 Part 2.1
- Activity sheet 6 Part 2.2
- OHT 6 Part 2.1
- OHP calculator
- Calculators
- Related Key Stage 2 national test questions

(Key objectives in bold)

Planning sheet	Day One	Unit 6 Part 2 Using a calculator	Term: <i>Autumn</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions
<p>Derive quickly: decimal fractions that total 1 or 10; all pairs of multiples of 50 with a total of 1000.</p> <p>VOCABULARY complement inverse estimate approximate</p>	<ul style="list-style-type: none"> Remind the class what we mean by complements to 10. Hold up a number card showing 0.7. Ask for complement of 0.7 to 1. <p>Repeat with similar examples and extend to include complements to 10.</p> <ul style="list-style-type: none"> Write incomplete number sentences on the OHP or board, include decimals that total 1 and 10 and multiples of 50 that total 1000. Use 'empty box' format: $0.6 + \square = 1$ $\square + 3.9 = 10$ $650 + \square = 1000$ <p>Ask children for answers and to explain their strategies.</p>	<p>Develop calculator skills and use a calculator effectively.</p> <p>Check with the inverse operation when using a calculator.</p> <p>VOCABULARY enter clear clear all operation key inverse sign change key $\boxed{+/-}$</p>	<ul style="list-style-type: none"> Write on the board $754 + \square = 1025$. Ask children to work in pairs to find answer. Record answer and ask children how they can check it. <p>Q. How can we check the answer using the inverse?</p> <ul style="list-style-type: none"> Ask children to use their calculators. Using OHP calculator to model use of clear \boxed{C} and clear entry keys \boxed{CE} <p>Do several examples where second number entered has to be changed</p> <p>i.e. $365 + \cancel{295} 195 = 560$ $365 \boxed{+} 295 \boxed{C} 195 = 560$</p> <p>Q. How can you check the answer using inverse?</p> <p>Do several examples including examples that use negative numbers.</p> $10 - 13 = -3$ $-9 + 8 = -1$ <p>Model on number line.</p> <p>Q. How would you display -9. Model using OHP calculator use of the sign change key? $\boxed{+/-}$</p> <p>Set class mixture of calculations to do in their books. Emphasise appropriate use of mental, written or calculator methods and importance of estimating and checking answers. (i.e. Activity sheet 6 Part 2.1)</p>	<ul style="list-style-type: none"> Write some calculations on the board e.g. $14.7 \times 2.3 = 338.1$ $1001 \times 13 = 77$ $56.71 - 33.47 = 33.24$ $329.45 \div 5.99 = 55.838983$ $-35 + 42 = 78$ <p>Q. Do these answers seem reasonable? Why? Why not?</p> <p>Ask children to work in pairs to find what errors have been made when using the calculator.</p> <ul style="list-style-type: none"> Summarise common errors e.g. decimal point in wrong place, wrong operation, incorrect digits etc. <p>Emphasise the need to estimate and to check answers using inverse operations.</p> <ul style="list-style-type: none"> HOMEWORK – Use Activity sheet 6 Part 2.2. <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Use the clear and clear entry keys, all operation keys, the = key and decimal point; Have a feel for the approximate size of an answer and how to check it using the inverse; Recognise a negative number output and use the sign change key $\boxed{+/-}$ where appropriate. <p>(Refer to supplement of examples, page 71.)</p>

Planning sheet	Day Two	Unit 6 Part 2 <i>Using a calculator</i>	Term: <i>Autumn</i>	Year Group: 6
Oral and Mental		Main Teaching		Plenary
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions
<p>Recognise, and extend number sequences.</p> <p>Explain number patterns and predict.</p> <p>VOCABULARY calculator display steps function sequence</p> <p>RESOURCES OHP calculator</p>	<ul style="list-style-type: none"> Before placing on OHP, set up OHP calculator with a particular function. For + 2.5, enter 2.5, +, +, =, 0. Explain the calculator has been set to count in equal steps, and invite a child to suggest a starting number. Enter this number and press the = several times. Ask the class: <ul style="list-style-type: none"> Q. What will be the next number in the sequence? Q. What is the function in the calculator? Q. What number will appear after 5 or 10 presses? Q. How many presses will it take to get a number bigger than 120? Repeat using a different operation e.g. $\div 2$ and different starting whole numbers. Get children to describe the functions and to predict outcomes. 	<p>Develop calculator skills and use a calculator effectively.</p> <p>VOCABULARY enter clear memory key memory recall key</p> <p>RESOURCES OHP calculator Class set of calculators</p>	<ul style="list-style-type: none"> In pairs, ask children to calculate $2 + 4 \times 3 =$ $\begin{array}{l} 18 \\ \swarrow \searrow \\ 14 \end{array}$ Remind children of the meaning of brackets in a calculation. Work through examples where brackets are put in different places e.g. $7 \times (8 + 6)$ and $(7 \times 8) + 6$. Get children to work in pairs to put in missing brackets e.g. for: $3 + 6 \times 4 = 36 \qquad 3 + 6 \times 4 = 27$ Discuss their solutions. Stress that multiplication is completed before addition but that brackets help to avoid misunderstandings. Discuss the order of operations. Give out calculators. Use the OHP calculator to illustrate with the children how to enter brackets. Link the use of brackets to the memory facility by presenting the following: $(108 + 57) \times (87 + 48)$ Show children how to use the MC button to clear the memory, the M+ and M- buttons to store and amend stored calculations, and the MR button to retrieve stored calculations. Ask children to complete the following using their knowledge of the four operations (+, -, \times, \div) <ol style="list-style-type: none"> $(48 - 20) \div (10 - 3) = 4$ Model this example $(352 - 32) - (416 - 338) = 858$ $(472 - 8) + (1116 - 106) = 1069$ $(483 - 20) \times (119 - 7) = 8551$ Collect answers and discuss strategies children used to find missing operations. Set children task to work in groups to form their own missing operations questions and to select one for the plenary. 	<ul style="list-style-type: none"> As a class find the answers to each group's question. Encourage children to use correct vocabulary in their explanations. Use children's strategies to exemplify calculator skills. Ask: <ul style="list-style-type: none"> Q. When would you use the memory on a calculator? Q. How do you enter a calculation in the memory? Discuss responses and emphasise that the calculator is a useful tool but is not always necessary. Split the class into 2 groups, only one can use a calculator. Get the children to close their eyes, write on the board: $(1.8 + 8.2) \times (12.4 - 8.4)$ and see if non-calculator group can beat calculator group. <p>By the end of the lesson children should be able to:</p> <ul style="list-style-type: none"> Start to use the memory and select the correct key sequence; Carry out calculations with more than one operation using brackets and the memory. <p>(Refer to supplement of examples, section 6, page 71.)</p>

Planning sheet	Day Three	Unit 6 Part 2 Using a calculator	Term: Autumn	Year Group: 6									
Oral and Mental		Main Teaching		Plenary									
Objectives and Vocabulary	Teaching Activities	Objectives and Vocabulary	Teaching Activities	Teaching Activities / Focus Questions									
<p>Consolidate knowing multiplication facts by heart.</p> <p>VOCABULARY factors row column consecutive numbers</p> <p>RESOURCES OHT 6 Part 2.1</p>	<ul style="list-style-type: none">Spend a few minutes reciting multiplication tables. <p>Display OHT 6p2.1</p> <table><tr><td>12</td><td>18</td><td>20</td></tr><tr><td>42</td><td>56</td><td>60</td></tr><tr><td>72</td><td>90</td><td>96</td></tr></table> <p>Ask children to chose a number and find as many pairs of factors as possible in 2 minutes. For 60: 2 and 30, 3 and 20 4 and 15, 5 and 12 6 and 10, 1 and 60</p> <ul style="list-style-type: none">Repeat with children selecting 2 more numbers from a different row and column. <p>Work through 12 and highlight that it has consecutive factors 3 and 4. Ask children to check their list for other factor pairs that are consecutive.</p>	12	18	20	42	56	60	72	90	96	<p>Develop calculator skills and use a calculator effectively.</p> <p>VOCABULARY product enter clear operation key</p> <p>RESOURCES OHP calculator Class set of calculators</p>	<ul style="list-style-type: none">Write 30 on the board. Tell the children this is the product of 2 consecutive numbers. Ask the children to suggest what the 2 consecutive numbers may be. Try out suggestions and show the children how they might use a trial and improvement method: 3 × 4 = 12 (too low) 6 × 7 = 42 (too high) <p>Illustrate the idea of working within the range.</p> <p>Model with several examples i.e. 56, 90</p> <ul style="list-style-type: none">Give out calculators. Write 156 on the board and set the children the same task but with the option to use a calculator. Ask: <div>Q What strategies did you use?</div> <div>Q What knowledge did you use?</div> <div>Q How did having a calculator help?</div> <p>Ask how they might use the size of the number – could the consecutive numbers be over 20? Ask how they might use the unit digit 6. What factors when multiplied together give an answer with the unit 6. Demonstrate using OHP calculator how to narrow the range and use number knowledge.</p> <ul style="list-style-type: none">Get children, in pairs, to find 2 consecutive numbers with products 182, 342, 506, 702, 1206. Review the children's answers. <div>Q Can you find 2 consecutive numbers with a product that is an odd number?</div> <div>Q Can you find a square number that is the product of 3 consecutive numbers.</div> <ul style="list-style-type: none">Discuss the children's findings. Encourage them to make conjectures and ask how do they arrive at these. Is it possible to search all the possibilities or can they argue their case?	<ul style="list-style-type: none">Write the number 16 002 on the board. (answer 126 × 127) <div>Q How should I begin to find the two consecutive numbers that give this number?</div> <div>Q What information can I use?</div> <div>Q What numbers can I rule out? How do I check this?</div> <p>Discuss and then show using OHP calculator.</p> <div><p>By the end of the lesson children should be able to:</p><ul style="list-style-type: none">Use a calculator to respond to questions such as find 2 consecutive numbers with a product of 1332;Estimate by approximating the size of an answer.<p>(Refer to supplement of examples, page 71, and 73.)</p></div>
12	18	20											
42	56	60											
72	90	96											

12	18	20
42	56	60
72	90	96

2000 Test B

7

Write **two numbers**, each **greater than 100**, to complete this subtraction



− =

2

0

8

7

1 mark

2000 Test B

17

Put a tick (✓) in the correct box for each calculation.

Use a calculator.

The first one has been done for you.



	less than 1000	equal to 1000	more than 1000
8.9 × 9.9 × 11.9			✓
(786 − 387) ÷ 0.41			
95.4 + (91 × 9.95)			
12.5 × (21.1 + 58.9)			

17

2 marks

2

Mixed calculations

Decide the quickest, easiest and most accurate way to do each calculation: in your head, on paper or with a calculator. Check each answer by carrying out the Inverse operation, for example, $4263 \div 49 = 87$
check: $49 \times 87 = 4263$

Show your method

$$552.23 - 199.8 =$$

$$59 + 1978 + 697 =$$

.....

$$472 \times 97.4 =$$

$$8000 - 5999 =$$

.....

$$925 \times 450 =$$

$$3686 \div 38 =$$

.....

$$950 \times 47.5 =$$

$$33 \times 4.28 =$$

.....

Who is right,
Ringo or Bingo?

Explain why you
think so.

$$46 \times 80.3 = 3693.8$$

$$809 + 5125 + 27 = 5961$$



$$835 - 25.5 = 580$$

$$6504 \div 24 = 27.1$$

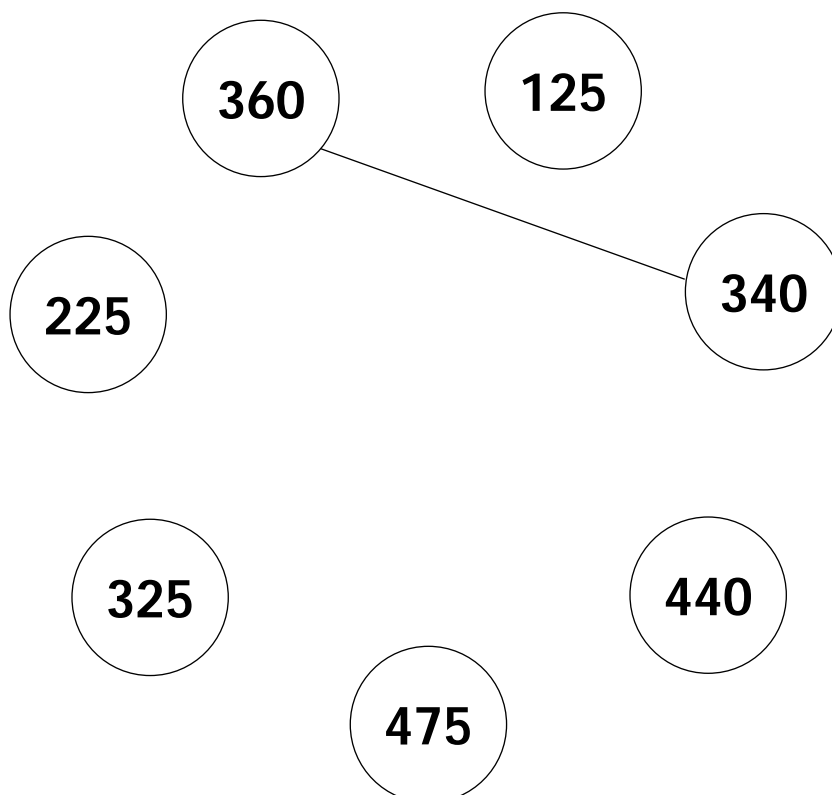


Related Key Stage 2 national test questions:

2000 Test B

1

Draw a line to join two other numbers which have a **total** of **700**



1

1 mark

2000 Test B

4

Write in the **missing** number.



$$60 + 99 + \boxed{} = 340$$



4

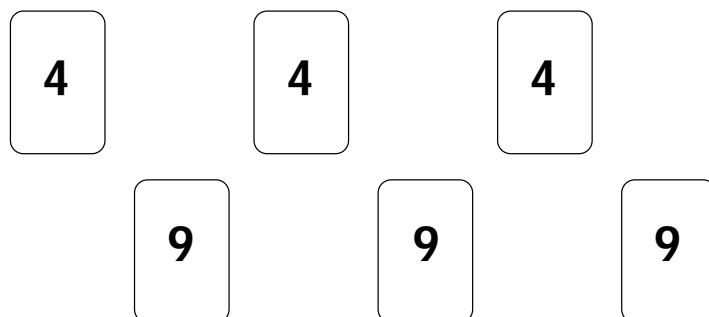
1 mark

Set of questions, involving the four operations and brackets, where digits are missing

2001 Test B

6

Here are some number cards.



Use **five of the number cards** to make this correct.

$$\begin{array}{r}
 \begin{array}{|c|} \hline \\ \hline \end{array} \begin{array}{|c|} \hline \\ \hline \end{array} \begin{array}{|c|} \hline \\ \hline \end{array} \\
 + \quad \quad \begin{array}{|c|} \hline \\ \hline \end{array} \begin{array}{|c|} \hline \\ \hline \end{array} \\
 \hline
 \begin{array}{ccc} 5 & 4 & 8 \end{array}
 \end{array}$$

6
2 marks

2001 Test B

7

Write in what the **missing** numbers could be.

$$\begin{array}{|c|} \hline \\ \hline \end{array} \div \begin{array}{|c|} \hline \\ \hline \end{array} + 90 = 100$$

7
1 mark

2001 Test B

21

Write in the **missing** number.

$$404.09 \div \begin{array}{|c|} \hline \\ \hline \end{array} = 8.5$$

21
1 mark

Set of questions, involving the four operations and brackets, where digits are missing

2002 Test B

16

Use a calculator to work out

$$49.3 \times (2.06 + 8.5)$$



16

1 mark

2002 Test B

10

Write in the **missing** number.



$$32.45 \times \boxed{} = 253.11$$

10

1 mark

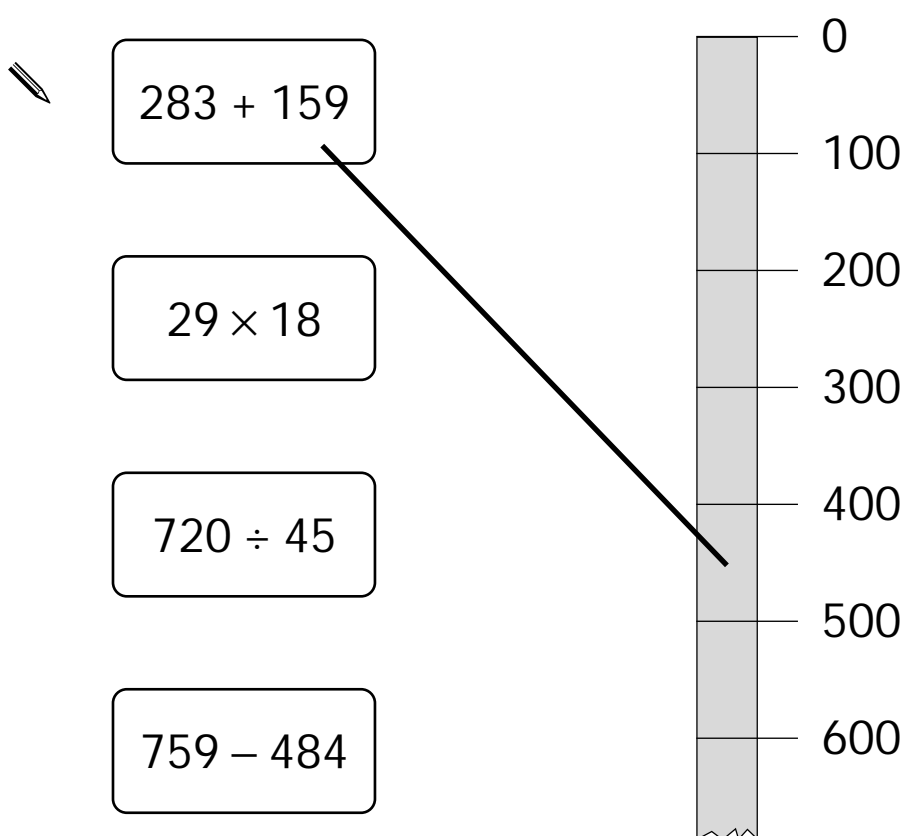
2002 Test B

1

Draw a line from each card to the correct part of the number line.

One has been done for you.

You may use a calculator.



1a
1 mark

1b
1 mark

1c
1 mark