LESSON

9N3.2 Using a calculator

OBJECTIVES

- Make and justify estimates and approximations of calculations.
- Use a calculator efficiently and appropriately to perform complex calculations with numbers of any size; use sign change keys and function keys for powers, roots, brackets and memory.

STARTER

10 minutes

Vocabulary
estimate
significant digit
units digit

Resources
OHT 9N3.2a (cut up the answers beforehand)
Calculator

Introduce the grid on **OHT 9N3.2a** (note that the answers need to be cut up beforehand and spread around the grid; keep an uncut copy of the answer grid to use as a check). Ask pupils, in pairs, to match an answer with its question on the grid by estimating the answer.

Allow a few minutes, then check results:

Q How did you estimate that?

Q Did you consider the size of the numbers?

Q Did you use the unit digits?

Continue with other examples, involving other pupils, until the sheet is complete.

MAIN ACTIVITY

40 minutes

Vocabulary
brackets
cube
fraction
keystroke
square
square root

Resources
Calculators for pupils
OHP calculator
OHT 9N3.2b
Framework examples, pages 108–109

Clarify, using examples, the use of the brackets, memory and sign change keys on a calculator. Pupils could make up an example for a partner. Invite individuals to demonstrate good examples to the class on the OHP calculator.

Explain to pupils that when doing calculations they need to decide which is the most efficient way of tackling the problem and which keys are the most appropriate.

Ask pupils to calculate problems 1–3 on **OHT 9N3.2b**:

1 $(23 \times 37) - (42 \times 17)$

2 $(43.6 - 17.93)^3 + \sqrt{4.68}$

3 $$\frac{63.2 \times 9.56}{8.2 - (3.5 - 1.49)}$$

Invite pupils to demonstrate the order of their keystrokes using the OHP calculator. Highlight the use of the brackets, memory and sign change keys as appropriate.

Introduce and discuss problem 4:

4 Packets of biscuits are packed in boxes which hold 144 packets. A factory makes 20 000 packets of biscuits. Can all the packets be put into completed boxes? How many completed boxes will there be? How many packets will be left over?

Check that pupils are able to find the remainder and that they realise it should be an integer value.

Model ways to find this using a calculator:

20 000 ÷ 144 = 138.8889.
Then subtract 138, the number of complete boxes.
0.8889 is a fraction of a box. How many packets is this? (128 packets)

Now set problem 5:

5 How many days, hours, minutes and seconds are there in a million seconds?

Ask pupils to discuss the question in pairs.

Q How will you get started? Think about how to deal with the remainder.

PLENARY

10 minutes

Invite a pair to explain and demonstrate their solution to problem 5 using the OHP calculator.

Make sure that pupils understand how to deal with the remainders.

As an extension, you could ask pupils how they would calculate the number of days, hours, minutes and seconds there are in 10 million seconds.

KEY IDEAS FOR PUPILS

- Use a calculator efficiently, including the use of function keys for powers and roots, brackets, and memory.
- Know how to deal with remainders when using a calculator.

OHT

9N3.2a Estimation jigsaw

2.3×5.8	$5130 \div 95$	32×3.8	$371.2 \div 5.8$
$1421 \div 29$	6.5×9.8	$2769 \div 71$	38×68
51×61	$1769 \div 29$	71×19	$44.89 \div 6.7$
$2511 \div 81$	49×64	$345.8 \div 91$	49×51

Cut up one copy of the following into individual answers.

Keep a second copy as a check.

13.34	54	121.6	64
49	63.7	39	2584
3111	61	1349	6.7
31	3136	3.8	2499

OHT

9N3.2b Calculator problems

1 $(23 \times 37) - (42 \times 17)$

2 $(43.6 - 17.93)^3 + \sqrt{4.68}$

3 $$\frac{63.2 \times 9.56}{8.2 - (3.5 - 1.49)}$$

4 Packets of biscuits are packed in boxes which hold 144 packets.

A factory makes 20 000 packets of biscuits. Can all the packets be put into completed boxes?

How many completed boxes will there be? How many packets will be left over?

5 How many days, hours, minutes and seconds are there in a million seconds?

What about 10 million seconds?