

Spotlight 5: a learning check

Misuses half-understood rules about multiplying and dividing by powers of ten and the associative law, for example $145 \times 30 = 145\ 000$

Opportunity for: discussing and explaining

Beat the calculator

Time 5–15 minutes

Resources

- Wipe-clean place value board
- Calculators
- A group of four or more children (a whole class is ideal)

Check: does the child use key vocabulary?

multiply by	two-digit numbers
divide by	three-digit numbers
digits move to the left/right	factors
ten times larger/smaller	

Teaching activity

‘Today we are going to play a game to help you practise multiplying and dividing by multiples of ten.’

This game, **Beat the calculator**, is a small- or large-group game and works well with the whole class. The game can be played at many different levels and can be used to give practice and consolidation of a wide range of learning objectives.

How to play

1. Divide the children into two groups. Give the children in one group a calculator each but give nothing to the second group. Tell the second group that they can make jottings on paper if they want to.
2. Read out a series of calculations. Here are a few examples:
 45×100 100×2 $30 \div 10$ 29×100 $450 \div 10$
3. The group with calculators must key each calculation in, and not call anything out until they see the answer on their screen.
4. The group with no calculators must work out the calculation in their heads, or with brief jottings, and then call out the answer.

(Depending on the calculations which you read out, the group without the calculators could beat the children with calculators! That is a very valuable lesson, making this game one to play at least once a term.)

? Why could you work that out so quickly in your head? Can you tell us how you did it? Did anyone do it a different way?

5. Give a hundred points to the group that shouts out the answer first and keep the scores on the board.
6. After about five or ten goes, swap the groups round and call out five or ten more calculations.

Variations

- Let one of the children work out about ten questions of their own which they think could be worked out more quickly mentally than on the calculator. That child is then the leader and calls out their questions.

? Can you explain to me how you worked that out?**Is there another way to do it?**

- This can be a good game to share with parents, especially those who think that calculators harm children's mathematics!

Learning outcomes

By the end of this set of activities children should be able to:

- use and understand connected mathematical vocabulary;
- tackle related learning tasks with increased motivation and confidence;
- multiply and divide by ten and a hundred;
- describe what is happening to the digits in multiplying and dividing by powers of ten;
- multiply by multiples of ten, a hundred and a thousand;
- use factors to support multiplication;
- use a calculator appropriately.