SPRINGBOARD 6 LESSON 9
FRACTIONS, DECIMALS AND PERCENTAGES 3

TOTAL TIME

Objectives:

- Calculate simple percentages of whole number quantities

Vocabulary:

- hundredths
- percentage
- equivalent

By the end of the lesson children should be able to:

- find a percentage of a quantity by halving and quartering and finding multiples of 10%;
- find a percentage of a quantity by first finding 1%, then multiplying.

Resources:

- whiteboards
- OHP calculator
- calculators

ORAL AND MENTAL STARTER

Remind children that $\frac{1}{2}$ and 50% are equivalent.

Children use whiteboards to show the answers to the following questions:
Show me 50% of 48, 72, 140, 460, 8000 and 89.

Q: If we know 50% of something, how can we find 25%?

Emphasise the halving of 50%. Ask children to show 25% of 80, 64, 72, 140, 460 and 8000.

Ask the children to think of a multiple of 10 that is less than 1000. Say that you will find 10% of their number very quickly. Take numbers from children and give the 10%.

Q: How am I able to find the answer so quickly?

Discuss how to find 10% of any quantity including finding 10% of numbers less than 100, e.g. 35, 46.

Q: If we know 10% how can we work out 15%?

Discuss how the children can find 10% and then half of 10% to get 5%. Work through finding 15% of 300.

Using whiteboards ask children to find 15% of 400, 60, and 120.

MAIN TEACHING ACTIVITY

15 MINUTES

Q: How can we find 1% of a quantity?

Ask children what 1% means and how $\frac{1}{100}$ helps them to find 1%.
Ask children to find 1% of the following quantities:

200 km, 300 g, £680, 3500 cl.

Confirm the answers by demonstrating the calculation with an OHP calculator. Discuss each of the answers and highlight that the answer must include the units.

Record the results on the board.

1% of 200 km = 2 km, 1% of 300 g = 3 g, 1% of £680 = £6.80,
1% of 3500 cl = 35 cl.

Using the above information ask the children to find the answers to the following: 4% of 200 km, 3% of 300 g, 2% of £680, 4% of 3500 cl.

Ask the children how they used the answers on the board to calculate these percentages. Draw out that the method is to find 1% by dividing by 100 and then multiplying by the percentage. Say that this always works. Give out calculators and work through two of the questions.

Q: How can we find 27% of £387 using a calculator?

With the children, divide 387 by 100 to find 1% and then multiply by 27 to find 27%.

Record as follows:

1% of £387 = £3.87, 27% of £387 = £3.87 × 27 = £104.49

Ask the children to find 17% of £45 and 4% of £66.50.

PLENARY

10 MINUTES

Q: What strategy would you use to find 50%, 25%, 10%, 20%, 60% of a given amount?

Encourage the children to use halving, doubling and quartering, dividing by 10 to

find 10% and then multiplying to find 60%.

To find 60% compare different methods: 6 × 10% and 50% + 10%.

Present the following question:
'79% of children at a school thought that the school dinners were good. If there are 340 children in the school, how many children thought that the dinners were good?'

Q: What calculation is required to answer the question?

Get the children to work out the answer. Using an OHT calculator, draw out the fact that to find 79% of 340 the calculation can be written as (340 ÷ 100) × 79.

Q: How do we interpet the answer 268.6 children?

Discuss the fact that we can only have a whole number of children. Establish that a sensible answer would be 269, as the percentage was only approximate.

Q: Why is 269 a more accurate answer than 268?

Remind the children when they need to round up or down.

Remember:

When finding a percentage of a quantity:

- first find 1%;
- then multiply this answer by the percentage;
- decide if you need to round up or down;
- include the units.

LESSON 9 RELATED TEST QUESTION
2000 MENTAL ARITHMETIC TEST

13 What is two percent of three hundred? 1 mark

MARK SCHEME

6

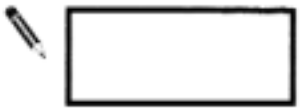
ANALYSIS OF CHILDREN'S ANSWERS

- Many children did not give an answer to questions related to decimals, fractions or percentages.
- When asked to calculate a percentage of a number above one hundred the response rate drops. It was very low for this question and the common errors including dividing 300 by 2 or, in fewer cases, subtracting 2 from 300.

IMPLICATIONS FOR PLANNING

- Plan to end plenaries with some quick-fire questions involving percentages, fractions and decimals.
- When setting work involving percentages always include numbers bigger than 100.

24 Calculate **15%** of **460**



MARK SCHEME

69 1 mark

ANALYSIS OF CHILDREN'S ANSWERS

- Almost half of children working at Level 3 did not give a response; they had no strategies for starting the question.
- Most of the children working at Level 5 succeeded with a more formal written method. Others used a less formal strategy, finding 10% and then adding half of it to give 15%.

IMPLICATIONS FOR PLANNING

- Children should be taught to use familiar skills such as dividing by 10, halving and doubling when tackling percentage questions.
- Children should be taught to break up a percentage into 10%, 5%, 1% and use what they know to rebuild the percentage.