# Solving word problems

## National Curriculum attainment target

• Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

#### Prerequisites for learning

Pupils need to:

- $\bullet$  recall multiplication and division facts for multiplication tables up to 12  $\times$  12
- understand the effect of multiplying a number by ten
- add using the efficient method of column addition

#### Vocabulary

operation, multiplied by, multiplication, divided by, division, addition, subtraction, estimate, partition, tens, ones (units)

#### Jujecis

## Success criteria

Pupils can:

recognise the operation needed to answer a word problem

Lesson objective

mathematically

• Solve problems and reason

- write the calculation necessary to answer the problem
- write the correct answer to the problem



It is important that children do not see word problems as purely about the operation they are studying at the time. Many children tend to look at the numbers in a word problem without looking at the context of the problem. They therefore make mistakes choosing the correct operation or working out the answer to the calculation.

## **Getting Started**

- Choose an activity from Number Multiplication and division.
- Choose an activity from Fluency in Number Facts: Y3/Y4 Multiplication and division.

Collins
 Connect
Year 4, Unit 6, Week 1

#### Resources

Teach

 containers holding classroom resources for use as items for sale, for example, rulers, paintbrushes, glue sticks, pens, coloured pencils, each with an appropriate prepared label suggesting the quantity of items inside (choose a two-digit number) (per class), 2–10 digit cards (per class)

.....

- Display the classroom resource boxes with items for sale. Show the label with the quantity of items in the boxes so all of the children can see. Shuffle the number cards.
- Invite a child to the front to select a box of resources and to choose a number card.
- Say: Today we are going to make up some word problems. Some will involve multiplication and division and others will involve addition and subtraction. We have to think carefully about the problem to work out which operation is needed and write the correct calculation.
- Suggest a multiplication problem involving the selected item and the number card, for example, say: Each box contains 56 paintbrushes. I order four boxes. How many paintbrushes will there be altogether?
- Ask: What operation is required to answer this problem? (multiplication) What calculation is needed? (56 × 4 = )
- Say: Explain to your partner how you would work out the answer to this question.
- Invite some suggestions for how to work out the problem from various children.
- Ask: What is 56 × 4? How did you work it out? Which strategy did you use?
- Write the answer to the calculation on the board using the method identified by the children, for example, mental partitioning, grid method, formal expanded method or compact method.
- Discuss which would be the most appropriate method to use in this instance, for example, mental partitioning, because the numbers used are easy to multiply.
- Write the answer to the problem on the board: There are 224 paintbrushes altogether.

• Repeat the process above for other problems. Vary the operation used for each word problem, but retain a focus on multiplication of two-digit by one-digit numbers.

Sample questions should only include concepts children have learned to date and could be similar to:

- 78 glue sticks in a box. Four glue sticks per group. How many groups?
- 64 rulers per pack. Nine are sold. How many rulers are left?
- 43 blue pens in a pack. 32 red pens in a pack. How many pens altogether?
- 89 coloured pencils in a pack. Amy buys seven packs. How many coloured pencils altogether?

## Individualised Learning

Refer to Activities 2, 3 and 4 from the Learning activities on pages 238–239.

Pupil Book 4B: – Page 19: Solving word problems

Progress Guide 4: – Extension: Year 4, Unit 6, Week 1, Lesson 4: Writing word problems

### Plenary

- Read through some of the problems children have worked on independently.
- Ask them to share with the class the image they had in their mind, the calculation they used and the strategy they used to work out the answer.
  - Write the calculation on the board as required. Discuss any incorrect answers and ask children for suggestions about how to rectify these.
  - Emphasise the re-reading of the problem to ensure the answer corresponds to the question.



# **Overcoming Barriers**

- Some children may become confused with the number of different methods there are to work out the answer to TO × O calculations. You may prefer to teach one method only, or allow children to choose the method they find the easiest. Children are taught formal methods of calculating TO × O in readiness for calculations involving larger numbers, so it is important they are taught efficient methods. If children make consistent errors with these methods, they should return to informal methods until they have a greater understanding of the processes involved. It is also important at this stage that children are working towards being able to carry out TO × O calculations mentally.
- Children may have difficulties recognising some of the calculations required to answer word problems. Encourage them to visualise and draw a picture of what is happening to assist their understanding.