

## SPRINGBOARD 6 LESSON 5 PROBLEM SOLVING 1

**TOTAL TIME**

**Objective:**

- Identify and use appropriate operations (including combinations of operations) to solve word problems

**Vocabulary:**

- operation
- multi step

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

- Identify the key words and select the appropriate calculation to solve problems such as: 'There is space in the multi-storey car park for 17 rows of 30 cars on each of 4 floors. How many cars can park?'

**Resources:**

- Resource Sheet 5.1

**ORAL AND MENTAL STARTER**


From Resource Sheet 5.1 read Question 1 aloud and ask the children to say what they think the question is asking. Draw the following table on the board and complete the table with the children.

Question number	Information from question	Calculation
1	£2.50 for 1 hour. Cost for 3 hours?	$3 \times \text{£}2.50 = \text{£}7.50$

Use the recorded information and the children's prompts to find the solution. Get children to put the answer in a sentence such as 'The boat cost £7.50.'

Repeat with other problems. Ensure that the children are able to identify key 'bits' of information in the question.

Questions 5 and 6 include irrelevant information to ensure that the children listen carefully.

**MAIN TEACHING ACTIVITY**

Show the following statement:  
'Guidebooks cost £1.50 each.'

**Q: What questions can we ask using the above information?**

Explore a range of questions and incorporate key words and phrases such as:

- 'How many ... ';
- 'Increase in price ... ';
- 'How much change from ... '.

Get the children to identify the calculation they would need to make to answer these questions.

Now include the statement:

'A shop sells £24 worth of guidebooks'.

**Q: What questions could we ask now?**

- Encourage questions such as: 'How many guidebooks were sold?'
- 'How many more guidebooks would need to be sold for total sales of £33?'
- 'If the shop sold another 15 guidebooks, how much money would the shop take?'

Get the children to identify the calculation they would need to make to answer these questions.

Children work in pairs to develop a question based on the above information. They then work out the solution and exchange their question with another pair, who answer the question and check it against the solution.

Collect and discuss children's questions and answers.

**PLENARY**

Select another example from Resource Sheet 5.1. Work through it to exemplify the strategy set out below.

1. Read the problem carefully (twice or more).
2. Identify key words to help you think about what the problem is asking.
3. Put the problem into your own words or use pictures to help you understand the question.
4. Decide what information you need and what operations you will use.
5. Record your calculation and your solution.

6. Check you are using the correct units for measures and money.
7. Read the question again and check the reasonableness of your answer, making an estimate to help you.

**Q: What are some of the important words to look for when reading through a problem?**

Collect and note these down on the board. For each, give an example using small numbers, and ask the children for the calculation they need to carry out.

**Remember:**

Look for the key words in the questions to help you to decide what operations you have to use and the calculations you need to carry out.

**LESSON 5 RELATED TEST QUESTION**  
**2000 TEST A (NON-CALCULATOR) PAPER**

7



Some children go camping.  
 It costs **£2.20** for each child to camp each night.  
 They go for **6** nights.

How much will **each child** have to pay for the **6** nights?

Show your **working**. You may get a mark.

£

2 marks

There are **70** children.  
 Each tent takes up to **6** children.

What is the **least number of tents** they will need?

Show your **working**. You may get a mark.

tents

2 marks

**ANALYSIS OF CHILDREN'S ANSWERS**

- Children working at levels 3 and 4 found it difficult to know what calculation was needed.
- Many children failed to interpret questions that required them to put the answer into a context.
- They did not recognise that the remainder in a context needed to be included in the calculation, and that this might require some rounding.
- Division questions in context are some of the most difficult for children to complete. One in six children could not identify the correct operation to use.

**IMPLICATIONS FOR PLANNING**

- The vocabulary used in a problem solving lesson needs to be identified and discussed during the plenary.
- Children need to be presented with different contexts which require them to round an answer with a remainder either up or down.
- Problems involving division need to be given greater attention. Children should be given the opportunity to discuss strategies for solving problems requiring the operation of division.
- Children need to be given strategies to solve two-stage problems leading to multi-stage calculations.

**MARK SCHEME**

(a) Award **TWO** marks for the correct answer of **£13.20**.

Accept **£13.20p** **OR** **£13 20** **OR** **£13.20p** **OR** **£13–20p**. **Do not** accept for **TWO** marks incorrect representations of money values, e.g. **£1320** **OR** **£13.2** **OR** **£1320p**.

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, e.g.  $£2.20 \times 6 =$  wrong answer.

Calculation must be performed for the award of the mark. Accept **£13.2** **OR** **£1320p** **OR** **£1320** – for **ONE** mark.

Up to 2 marks

(b) Award **TWO** marks for the correct answer of **12**.

If the answer is incorrect, award **ONE** mark for evidence of appropriate working, e.g.  $70 \div 6 =$  answer other than 12.

Accept as appropriate working  $11\frac{2}{3}$  **OR** unrounded or inappropriately rounded calculations of  $70 \div 6$ , e.g. **11** **OR** **11 remainder 4** **OR** **11.6** even if no method is shown **OR** the two consecutive multiples of 6 which straddle 70, i.e. **66** and **72**.

Up to 2 marks