Observation Notes
Strategies for Multiplication and Division – Section D

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>OBSERVATIONS</th>
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<tr>
<td><strong>27. Teddy Cars</strong></td>
<td>• Children may not understand the word “each”.</td>
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<td><em>Put four matchboxes in a line.</em></td>
<td>• Do they collect teddies one at a time to place in cars or do they collect them in pairs?</td>
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<td>Here are four teddy cars. Please put two teddies in each car.</td>
<td>• Do they count the teddies by ones?</td>
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<td>a) How many teddies is that altogether?</td>
<td>• Do you the count them be twos or another way without prompting?</td>
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<td>b) Tell me how you worked that out.</td>
<td>• If given the prompt - Could you do that another way, without counting them one by one, do they respond?</td>
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<td>c) <em>If the child appears to be counting all, ask:</em></td>
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<td>Could you do that another way, without counting them one by one?</td>
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| **28. Sharing Teddies on the Mats**                                      |                                                                                                                                               |
| *Show the child the orange picture of four ‘teddy mats’. Put out 12 teddies of the same colour.* | • It is common for children to focus on the number four in this problem and to begin by putting four teddies on a mat and then four on the next and four on the next. Some realise that this is not right and make adjustments either by starting again and sharing the teddies one by one, or by making adjustments. |
| a) Here are four teddy mats. Here are 12 teddies.                         | • Some students share one by one/ others realise that they will have enough for each mat to have one so begin by put two on each mat and deal out the remaining teddies one by one. |
| Share the 12 teddies between the four mats, so that there is the same number of teddies on each mat. How many teddies go on each mat? | • Some students may do the task but may not answer how many are on each mat, they may say the total number of teddies. |
| b) How did you work that out?                                            |                                                                                                                                               |

| **29. Tennis Balls Task**                                                |                                                                                                                                               |
| *Put out 1 packet of 3 tennis balls.*                                    | • This task is the first that requires the students to visualise.                                                                            |
| Here is a packet of tennis balls.                                        | • Some student complete this task by count by ones – they count 1,2,3, 4,5,6 7,8,9 10,11,12                                               |
| a) How many balls would there be in four packets?                        | • Students may:                                                                                                                              |
|                                                                           | - nod their head to represent the counting of the objects                                                                               |
b) Tell me how you worked that out.
c) If the child appears to be counting all, ask:
Could you do that another way, without counting them one by one?

- use fingers to keep track of how many threes they have counted.
- skip count by 3
- use a doubling strategy e.g. 3, 6 then double 6 the answer is 12
  • If given the prompt - Could you do that another way, without counting them one by one, do they respond?

30. Dots Array Task

Here are some dots. Show red card (4 x 5) for an instant, in the orientation shown here. I’m going to hide some.

Cover the bottom 4 x 3 section, and the bottom half of the 3 dots above it.

a) How many dots are there altogether on the whole card?
b) How did you work that out?
c) If the child appears to be counting all, ask: Could you do that a faster way, without counting them one by one?

- A visualising task
- Some students only count what they can see - so might give an answer 8 or 6½
- Students who count by ones are often incorrect by one or two dots.
- Do they skip count by 5s or 4s
- If given the prompt - Could you do that another way, without counting them one by one, what is their response?

31. Teddies at the Movies

Here comes another story.
15 teddies are sitting in rows at the movies. The teddies are sitting in three equal rows. How many teddies are in each row?
How did you work that out?

- This task is done without materials and requires students to visualise the problem.
- Record their explanation of how they worked it out.
  • 3 fives are 15 is a known fact
  • skip counting skills eg 3, 6, 9, 12, 15 counted by 3 five times to get to 15 so there will need to be 5 teddies in each row.
- Do they skip count by fives to check?

32. Multiplication Problems

Show the child the pink card 3 x 10. Establish (if not known) what the child prefers (e.g., do you say ‘3 times 10’ or do you say ‘three 10s?’). Remove the card.
Tell me the answers to these questions.
Read the problems one at a time.
a) 3 x 10
b) 2 x 7
c) 10 x 7

- Consider the language used by students.
- Ask how they worked out the problems.
- Do they reverse some problems to make them easier?
- Consider the way they respond. Students who have experienced a culture where speedy responses are a major focus tend to spit out the answer often without real thinking.
- Note if the student repeats they question – some students do this to give themselves think time and to help make sense of the information
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<td>d) 3 x 50</td>
<td>Are they able to use basic facts to solve more complex problems e.g. 3 x 50 / 3 \times 5 is 15 so 3 \times 50 is 150 / Two fifties is 100 and one more 150</td>
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<td>e) 4 x 30</td>
<td></td>
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<tr>
<td>f) 5 x 7</td>
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### 33. Division Problems

*Show the child the pink card 16 ÷ 2. Establish (if not known) what the child prefers (e.g., Do you say '16 divided by 2?' or do you say '16, how many twos? or do you say 'how many twos in 16?'). Remove the card.*

Tell me the answers to these questions. *Read the problems one at a time.*

- a) 16 ÷ 2
- b) 60 ÷ 10
- c) 80 ÷ 4
- d) 24 ÷ 3
- e) 35 ÷ 5
- f) 35 ÷ 7

- Consider the language used by students.
- Ask how they worked out the problems.
- Do students see a link between multiplication and division and apply this successfully?
- Do they use a combination of thinking to solve the problem: e.g. 80 divided by 4 / 40 divided by 4 is 10 so 80 divided by 4 is 20 / or 8 divided by 4 is 2 so 8tens divided by 4 is 2tens which is 20
- Do they notice the link between question e) 35 ÷ 5 and f) 35 ÷ 7

### 34. Off to the Circus

97 people are going to the circus. 20 people can ride in each bus. How many buses will be needed to get all 97 people to the circus?

- Does the student focus on the context of the problem?
- Some student experience difficult with this task because it does not result in the same number of students on each bus.

### 35. Sharing our Money

*(pen and paper methods are acceptable for this task)*

*Show the child the pink card ($52).*

Share $52 evenly between four people. How much does each person get?

- This task requires students to solve problems with numbers beyond the traditional range of multiplication and division facts.
- Students can use pen and paper.
- Consider the method they use.
- Problem may be solve in a variety of ways possible examples include:
  - give each person $10 that leaves $12 to share which would be an extra $3 for each person. So each person gets $13
  - I know that 12 fours are 48 so I could give them $12 and then share out what left. They would get an extra dollar, so that would be $13.

### 36. In Your Head

*Show the child the orange card with the expression: 23 x 4.*

a) Tell me the answer for 23 x 4.

- Problem may be solve in a variety of ways; possible examples include:
  - 23 x 4: 25 x 4 is 100 then take away 2 x 4 which 8 so the answer is 92
  - front end multiplication 20 x 4 is 80 3 x 4 is 12 so the answer 80 plus 12, which is 92
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<th><strong>37. Missing Number</strong></th>
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<td>Show the orange card with $54 \times _ = __ _ _ 2$</td>
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<tr>
<td>a) The answer to $54 \times _ \text{ ends in } 2$. What can you tell me about this missing number?</td>
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<td>(Pointing to the space after the multiplication sign.)</td>
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<tr>
<td>b) How did you work that out?</td>
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<tr>
<td>c) Could it be any other number? How do you know?</td>
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→ **Section E**

- A very challenging task, students may be able to only complete part of the task.
- It requires them to think about what numbers when multiplied by a four will result in a final digit of 2.
- Are they able to rule out 1, 2 and 5 immediately?
- Record their explanation.
- Answer is either 3 or 8.