Gardening at home – Analysis of strategies

Link to the assessment resource, *Gardening at home* (NM1332).

This table gives detailed breakdowns of the use of different strategies and their success rates.

Table 1: Frequency of use and success rates of different strategies

Strategy	a) **6 × 5**	b) **4 × 8**	c) **3 × 12**	**Total**
Numerical				
Basic facts partitioning				
Fully multiplicative Mix	8 (8)	6 (4)	13 (12)	27 (24, 89%)
of mult. and additive	1 (1)	3 (2)	7 (5)	11 (8, 73%)
Place value partitioning	-	-	8 (8)	8 (8, 100%)
Doubling strategies				
Fully multiplicative Mix	4 (4)	2 (2)	-	6 (6, 100%)
of mult. and additive	3 (2)	14 (10)	4 (2)	21 (14, 67%)
Skip counting	15 (15)	10 (8)	8 (4)	33 (27, 82%)
Repeated addition	8 (8)	10 (8)	22 (15)	40 (31, 78%)
All numerical	***39 (38)***	***45 (34)***	***62 (46)***	***146 (118, 81%)***
Diagrams				
Drawing an array of objects	4 (4)	9 (8)	7 (6)	20 (18, 89%)
Drawing equal sets of objects	10 (10)	7 (6)	5 (4)	22 (20, 91%)
All diagrams	***14 (14)***	***16 (14)***	***12 (10)***	***42 (38, 90%)***
ALL STRATEGIES	**53 (52)**	**61 (48)**	**74 (56)**	**188 (156, 83%)**
Writes equation(s) 6 × 5	**91 (87)**	**80 (70)**	**65 (54)**	**236 (211, 89%)**
States 6 groups of 5	**2 (2)**	**3 (2)**	**2 (2)**	**7 (6, 86%)**
Adds numbers	**12 (1)**	**11 (0)**	**12 (0)**	**35 (1, 3%)**
Unrelated drawings	**7 (1)**	**6 (1)**	**5 (0)**	**18 (2, 11%)**
Other statements	**8 (2)**	**11 (3)**	**10 (2)**	**29 (7, 24%)**
Missing	**12 (8)**	**13 (4)**	**17 (6)**	**42 (18, 43%)**
TOTAL	**185 (153)**	**185 (128)**	**185 (120)**	**555 (401,72%)**

Based on a representative sample of 185 students

The first number is the number of students using the strategy.
The number in parentheses is the number who obtained a correct answer.

Patterns within the strategies used

- The numerical methods had a slightly lower overall success rate than diagrammatic methods.
- Students who used partitioning strategies that were fully multiplicative had a similar success rate as diagrammatic strategies.
- Students who just stated “6 × 5 = 30”, "5 × 6 = 30" were somewhat more successful than those who showed strategies. They were also the group with the highest mean ability. This may be because more able student “just know” the answer, i.e. used Basic Facts.
- Students who used partitioning strategies had the next highest mean ability.
- Students who used repeated addition did not have significantly higher mean abilities as those using skip counting. This questions whether these two strategies should be at different stages of the Number Framework, or at least questions what constitutes skip counting. It may be that skip counting is automated repeated addition. Alternatively, it could be that only a few very well known sequences (such as 2, 4, 6, 8 … or 5, 10, 25, 20, …) constitute skip counting as defined in the framework, whereas other sequences are a form of automated repeated addition.

- Students who used some identifiable form of tallying with their skip counting were more likely to get a correct answer.
- Students who used diagrams were of roughly equal mean ability as those using skip counting or repeated addition.
- The least able students treated the problems as additive (e.g.,6 + 5).