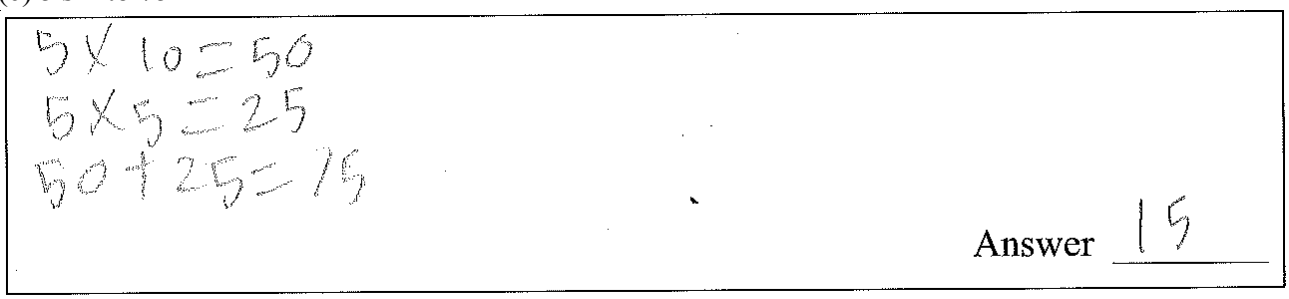
How many are there? – Student work samples

Link to the assessment resource, *How many are there?* (NM1327)

These examples are generally listed from the most sophisticated to the least sophisticated. The mean ability of students using each strategy largely follows the stages of the number framework. Click on the link Analysis of student responses for data of the breakdown of how successful students were at obtaining a correct answer to each question.

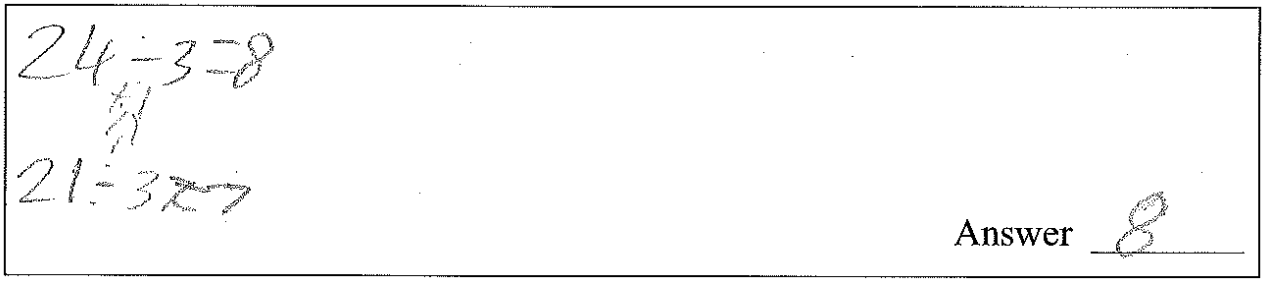
Fully multiplicative partitioning

(c) 5's into 75



Place value partitioning

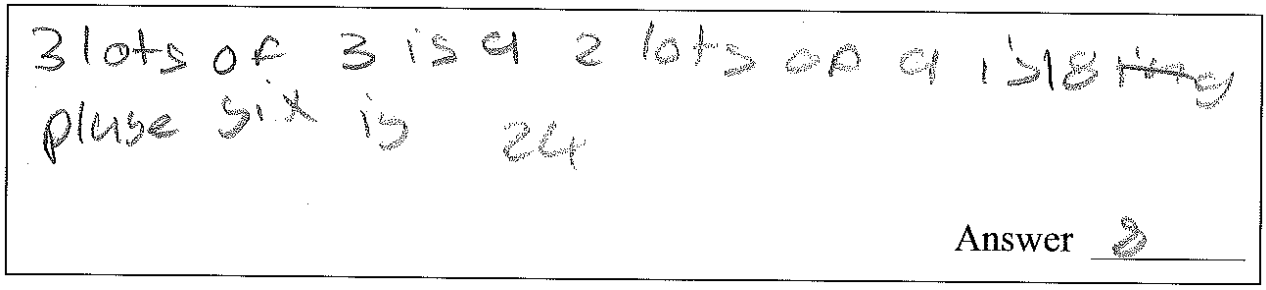
(a) 3's into 24



Basic fact partitioning with a single compensation.

Fully multiplicative doubling and halving

(a)) 3's into 24



This combines doubling with a final compensation of 6 (=3 × 2)

Mix of multiplicative and additive strategies

(b) 8's into 40

8 x 2 = 16 + 16 = 32 + 8 = 40

Answer 5

Partitioning followed by repeated addition or skip counting

(a) 3's into 24

~~3 x 7 = 24~~

3 + 5 = 15.
3 x 6 = 18.
3 x 7 = 21.
3 x 8 = 24.

Answer 24.

(c) 5's into 75

5 x 10 = 50.
5 x 11 = 55.
5 x 12 = 60.
5 x 13 = 65.
5 x 14 = 70.
5 + 15 = 75.

Answer 15.

Both these show using a basic fact followed by skip counting.

Vertical division algorithm

(a) 3's into 24

$$3\overline{)24}\quad 8,\ 24,\ 0$$

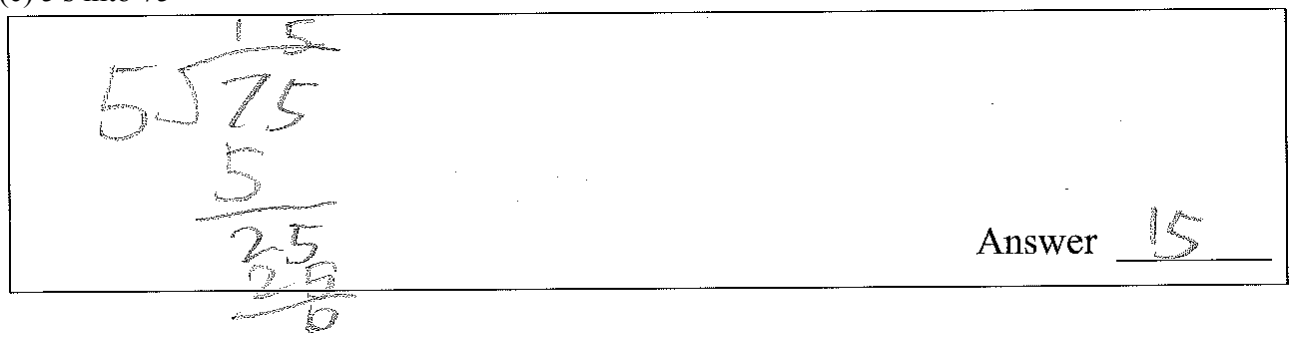
Answer 8

(b) 8's into 40

$$5\overline{)40}\quad 8,\ 40$$

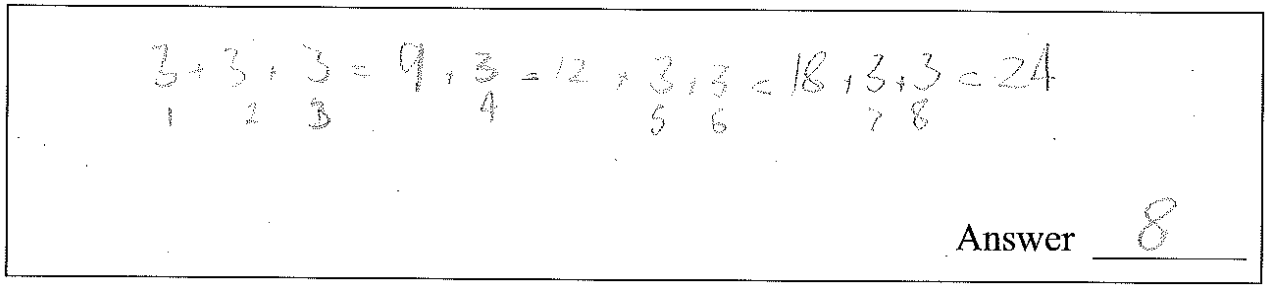
Answer 5

(c) 5's into 75



Repeated addition (evidence of tallying)

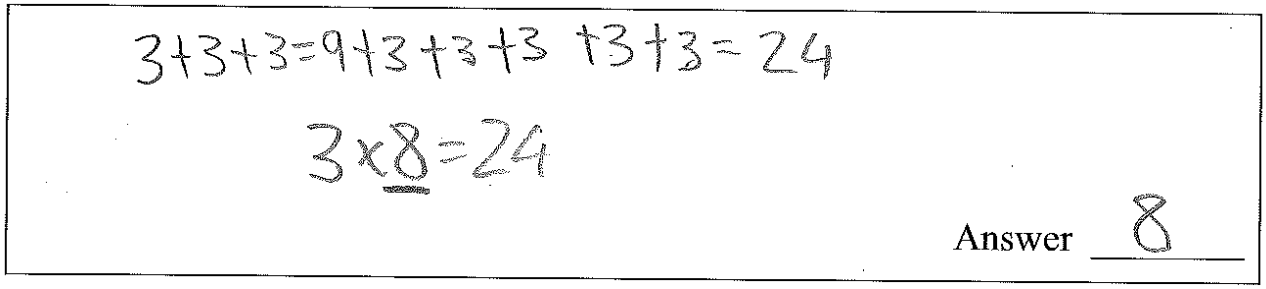
(a)) 3's into 24



This has evidence of tallying, making a correct answer more likely.

Repeated addition (evidence of tallying)

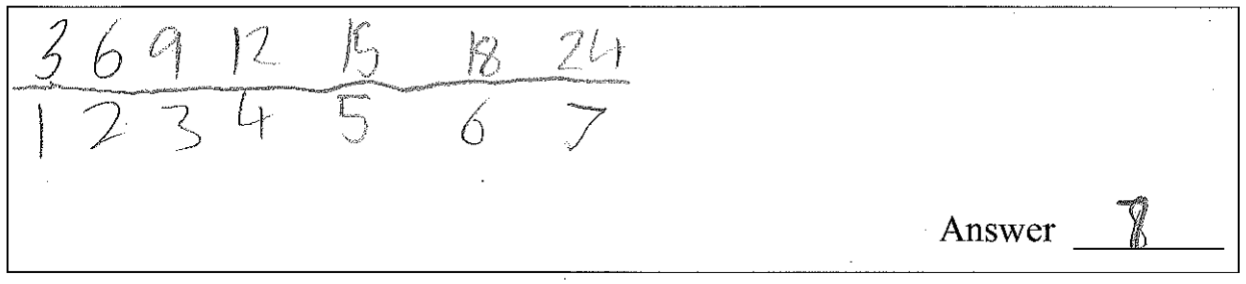
(a)) 3's into 24

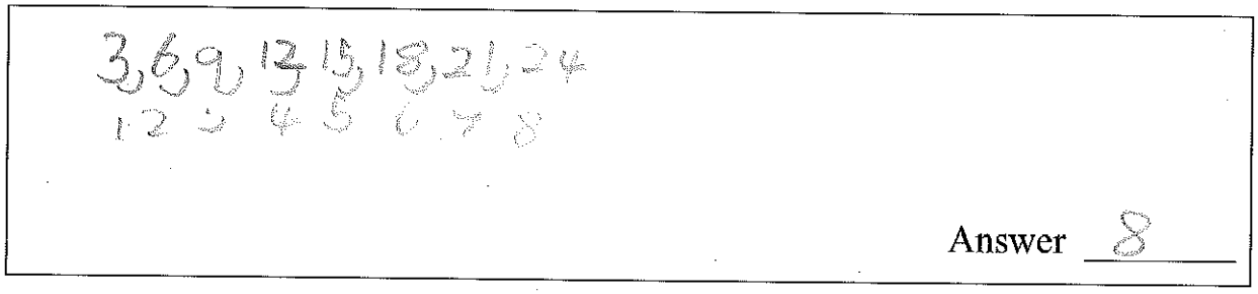


This has no evidence of tallying, making a correct answer less likely.

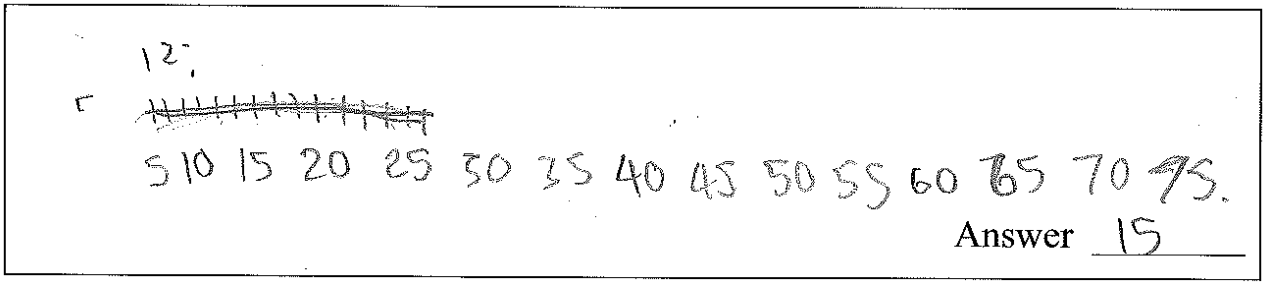
Skip counting (evidence of tallying)

(a) 3's into 24





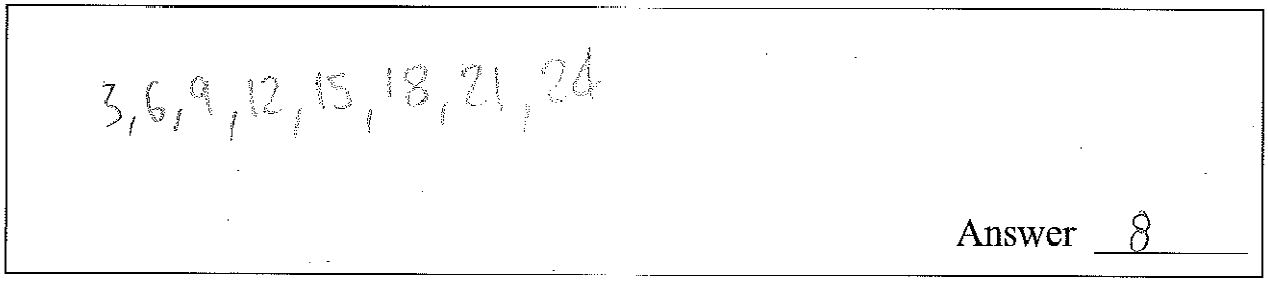
(c) 5's into 75

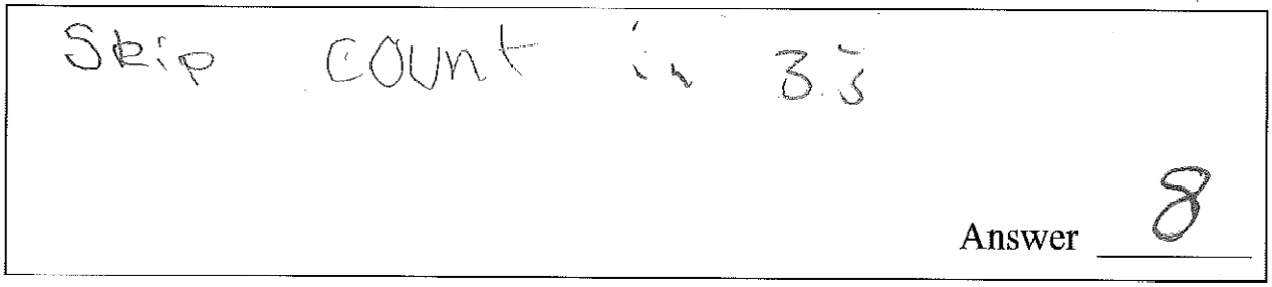


These three examples have evidence of tallying, making a correct answer more likely.

Skip counting (no evidence of tallying)

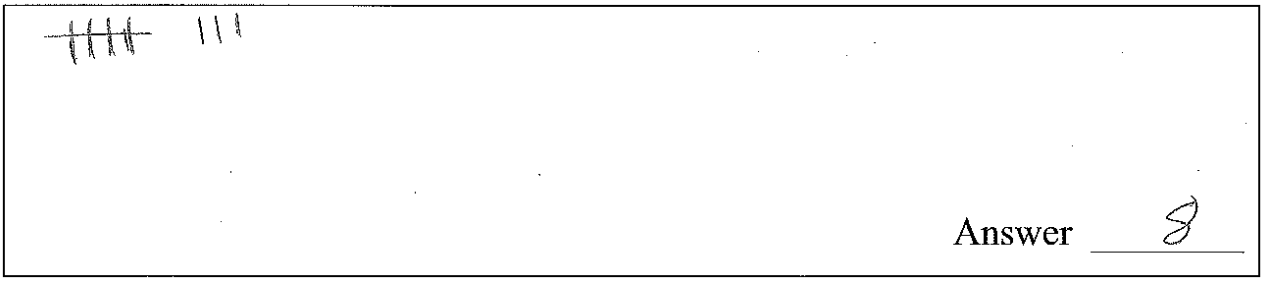
(a) 3's into 24



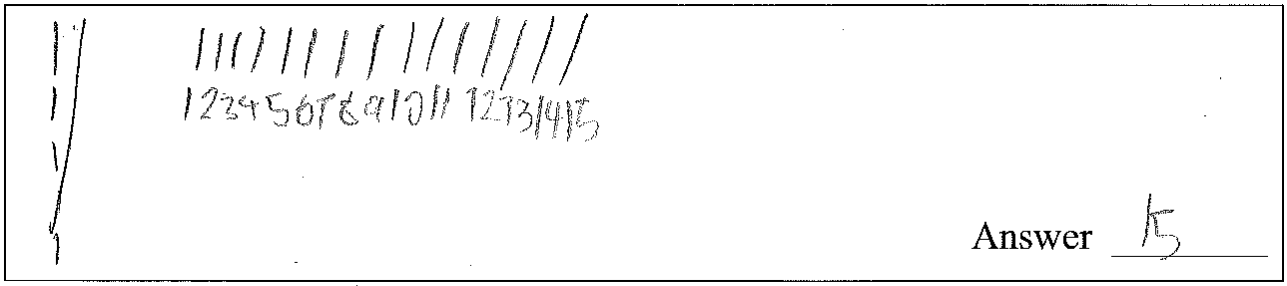


Skip counting – (only tally marks recorded)

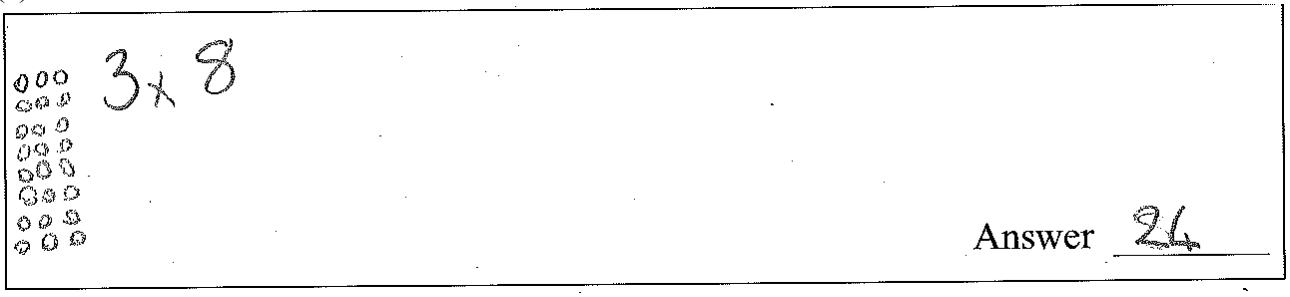
(a) 3's into 24



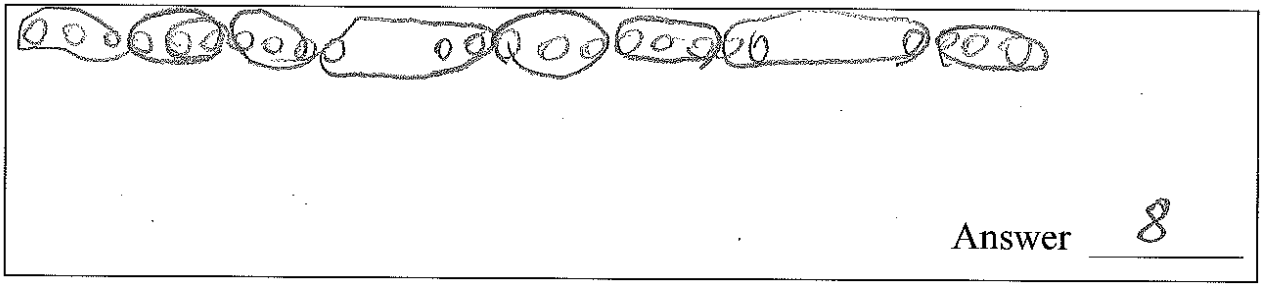
(c) 5's into 75



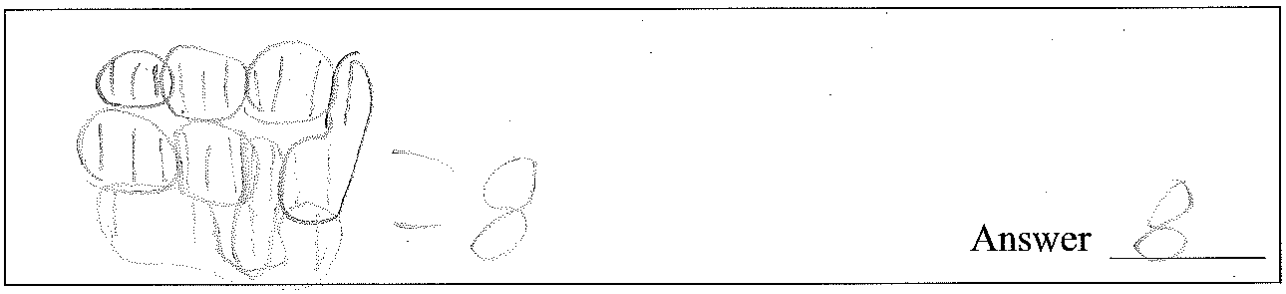
Array diagrams
(a) 3's into 24



Grouping diagrams
(a) 3's into 24



Semi-structured groups – could reformat into a multiplication array.



Unstructured groups