Estimating multiplication – Analysis student responses

Link to the assessment resource, *Estimating multiplication* (NM1345)

	Common numerical answer(s)	**Strategy used**	**Strategy name**
a)	160	20×8	Front-end or round (one number)
	180	$20 \times 10 - 2 \times 10$ **or** $23 \times 8 = 184$ so 180	Rounding and compensation **or** Exact calculation then rounds
	184	$20 \times 8 + (3 \times 8)$ **or** 23×8	Rounds then exact compensation **or** Exact calculation
	200	20×10	Rounding (both numbers)
	200	$25 \times 4 = 100$ **so** $25 \times 8 = 200$	Tidy numbers
b)	200	10×20	Front-end (both numbers)
	240	12×20	Front-end (one number)
	270	10×27	Rounding (one number)
	300	10×30	Rounding (both numbers)
	320	$12 \times 27 = 324$ **so** 320	Exact calculation then rounds
	324	$12 \times 30 - (12 \times 3)$ **or** 12×27	Rounds then exact compensation **or** Exact calculation
	360	12×30	Rounding (one number)
c)	4500 (or 450)	90×50	Front-end (both numbers)
	5000 (or 500)	100×50	Tidy number and rounds
	5264	94×56	Exact calculation
	5400 (or 540)	90×60	Rounding (both numbers)
	5600	100×56	Tidy number(one number)
d)	6 000	200×30	Front-end (both numbers)
	8917	241×37	Exact calculation
	9600 (or 960)	240×40	Rounding (both numbers)

Based on a representative sample of *183* students

NOTES:

- Many other strategies are possible.
- Exact compensations are possible, especially in parts a) and b).
- If an exact answer is obtained in all parts, the student is unlikely to be using estimation strategies.