Buses, games and trains – Student work samples

Link to the assessment resource, *Buses, games and trains* (NM1334)

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.

Partitioning to jump through tidy numbers
(a) 67 – 39

$$67 - 7 = 60$$
$$60 - 10 = 50$$
$$50 - 20 = 30$$
$$30 - 1 = 29$$

Answer: 29

An incorrect final jump of 1 was made instead of 2.

(b) 127 – 35

Add 8 to the 127 then it will be 135 —
35 = 100 – 8 = 92

Answer: 42

$$127 - 27 = 100$$
$$100 - 3 = 97$$
$$97 - 5 = 92$$

Answer: 92

Partitioning using complementary addition (adding on) to cross boundaries
(a) 67 – 39

$$39 + \_\_ = 67 \qquad 1 + 20 + 7 = 28$$
$$39 + 1 = 40 + 20 = 60 + 7 = 67$$
$$7 \qquad 67$$

Answer: 28

$39+1 = 40 \quad 40+20=60 \quad 60+7=67 = 28$

Answer: 28

Partitioning by rounding one number to a tidy number and compensation
(a) 67 – 39

67 68 – 40 = 28

Answer: 28

Place value partitioning both numbers using hundreds, tens and ones
(a) 67 – 39

28 because $60 - 30 = 30, -9 = 21 + 7 = 28$

Answer: 28

$60 - 30 = 30$
$7 - 9 = -2$
$30 + -2 = 28$

Answer: 28

This uses the concept of negative numbers, even though these are at curriculum level 4.

Place value partitioning both numbers using hundreds, tens and ones, expressing tens as ones
(a) 67 – 39

67 – 39

you use the 1s first

$6-3=3 \quad 9-7=3$ So the awnSer is Answer: 33

The student takes the smaller number away from the larger number in the 1s. This is equivalent to the "won't go" error in the vertical algorithm.

***Place value partitioning the smaller number into hundreds, tens and ones, subtracting in parts* in the correct direction**

(a) 67 – 39

$$67 - 30 = 37$$
$$37 - 9 = 28$$

Answer: _28_

Subtracts the 10s then the 1s

(b) 127 – 35

$$127 - 35$$
$$127 - 30 = 97$$
$$97 - 5 = 92$$

Answer: _92_

Subtracts the 10s then the 1s
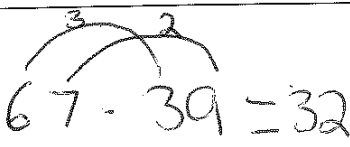
$$127 - 35 = 122 - 30 = 97$$

Answer: _97_

Subtracts the 1s then the 10s

Horizontal diagram of PV partitioning with the" won't go" error (equivalent of vertical algorithm error)

$$67 - 39 = 32$$
$$32$$

$$67 - 39 = 32$$

Answer: _32_

The student uses a diagram, but takes the smaller number away from the larger number in the 1s. This is equivalent to the "won't go" error in the vertical algorithm.