

## Letter-symbols: using a letter for an unknown

### CURRICULUM ALIGNMENT

**ALG.EXP.4** articulate, represent and solve mathematical situations through the use of expressions and equations that include letter-symbols.

**INTERACTIVES** Balance Scales · challenge, display, explore

### WHAT THIS LESSON TEACHES

A letter stands for a number we do not know yet. We use the letter to hold its place until we work out the value that makes both sides equal.

→ In  $n + 3 = 7$ , the letter  $n$  stands for 4.

→  $x - 5 = 12$  means  $x$  equals 17.

### MODEL THIS ON THE BOARD

#### FINDING N ON THE BALANCE

- 1 Look at the equation  $n + 3 = 7$ .
- 2 The letter  $n$  holds the place of the hidden number on one pan.
- 3 Ask what number plus 3 lands on 7.
- 4  $n$  must be 4 so the pans balance:  $4 + 3 = 7$ .

### ANSWER KEY

a) 8

b) 13

c) 5

Q1: 4

Q2: 13

Q3: 4

a) **Always** : Only 4 added to 3 gives 7, so  $n$  is fixed as 4.

b) **Never** : Only 5 makes  $n + 4 = 9$  true.

c) **Always** : Any letter can hold the place of an unknown until we find its value.

d) **Never** : A letter keeps one fixed value all through the same equation.

### EXTENSION SHEET · STRETCH ANSWERS

S1: 22

S2: 19

S3: 16

S4: 26

S5: 17