

Lesson 22 **NUMBER****Multiplication as arrays and repeated addition**

CURRICULUM ALIGNMENT

NUM.OPS.3

understand and apply flexibly the four operations; and the relationships between operations.

ALG.PRR.3a

identify rules that describe the structure of a pattern and use these rules to make predictions.

INTERACTIVES **Pattern Blocks** · display, explore

WHAT THIS LESSON TEACHES

An array sets objects out in equal rows and columns, so every row holds the same number. You can read an array as repeated addition or as a multiplication, and they give the same total.

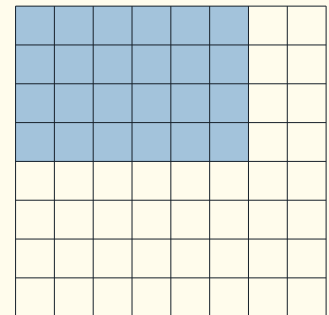
→ 3 rows of 5 buns is $5 + 5 + 5 = 3 \times 5 = 15$ buns.

→ Turn the 3-by-5 tray on its side to make 5-by-3, and it still holds 15.

MODEL THIS ON THE BOARD

ARRAY AS ROWS × COLUMNS

- ① The shaded array has **4** rows with **6** squares in each row.
- ② Read the rows as repeated addition: **$6 + 6 + 6 + 6$** .
- ③ That is the same as the multiplication **$4 \times 6 = 24$** .



DISCUSSION STARTER

REFLECT Did the grid make the parts of the product clearer for you?

ANSWER KEY

a) $5+5+5=15$, $3 \times 5=15$

b) 35

c) $12=12$ Q1: $7 + 7 = 14$; $2 \times 7 = 14$

Q2: 18

Q3: $8 + 8 + 8 = 24$; $3 \times 8 = 24$

a) **Always** : Repeated addition of one 5 for each of the 3 rows matches the array exactly.

b) **Never** : Turning 3-by-5 into 5-by-3 keeps the same 15 objects, just rearranged.

c) **Always** : That equal-rows rule is what makes a set of objects an array.

d) **Sometimes** : A 3-by-8 array has fewer rows than each row, but a 4-by-3 has more, so it depends.

EXTENSION SHEET · STRETCH ANSWERS

S1: 1757

S2: 7443

S3: 4735

S4: 600

S5: €3,475

Investigation: Arrays all around — open-ended; scan pupils' working for valid solution paths rather than a single answer.