

Equivalent expressions ($3 + 3 + 3 = 3 \times 3$)

CURRICULUM ALIGNMENT

NUM.OPS.3

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

ALG.EXP.3

represent and express problems with known and unknown values in different ways to include the use of appropriate letter-symbols or words.

INTERACTIVES Balance Scales · challenge, display

WHAT THIS LESSON TEACHES

A repeated addition and a multiplication can be two ways of writing the same amount. When both sides are worth the same, they are equivalent expressions and a balance beam sits level.

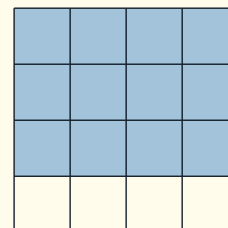
→ $4 + 4 + 4$ and 3×4 both make 12.

→ $5 + 5 + 5 + 5$ is four lots of 5, written 4×5 .

MODEL THIS ON THE BOARD

$$4 + 4 + 4 = 3 \times 4$$

- 1 The grid shows three rows with four squares in each row.
- 2 Three rows of 4 is the same as the addition $4 + 4 + 4$.
- 3 Three lots of 4 is written as the multiplication 3×4 .
- 4 Both equal 12, so $4 + 4 + 4 = 3 \times 4$.



DISCUSSION STARTER

REFLECT When does knowing that order does not matter in addition or multiplication save you time?

LESSON ARC

Open with $3 + 3 + 3$ versus 3×3 held open — same or different? The balance-scales interactive settles it: repeated addition on the left pan, matching multiplication on the right, beam level when values match. Work the third pair (nine 2s making 18) to prove equal value, not equal look, keeps it level. Pupils write repeated additions as multiplications in their copy, then match pairs with counters at the board. Student Activity Book carries the solo practice.

TEACHING MOVES

1. **Getting Started.** Put $3 + 3 + 3$ beside 3×3 and take three hands-up answers only — not open call-outs. Resist confirming; say 'the balance will settle this' and move on. Holding the question open is what makes the next step land.
2. **Watch and Notice.** On the first pair, point at the four 2s then the total and ask 'how many times did we add?' On the third pair, hold out for the class to say each side is worth 18 before you let them look at the beam — this is the pair where equal value, not equal appearance, keeps it level.
3. **Try It Together.** Build 2×4 on the right of the beam together to level $4 + 4$, class agreeing or correcting aloud, then draw the other three on the board. Always ask 'how many lots?' before anyone builds —

watch for a pupil counting the value on the pan instead of the number of groups, and steer with 'how many times did we add it?'

4. **Write It as a Multiplication in Your Copy.** Walk the room checking the multiplication reads groups-first: three lots of four is 3×4 , not 4×3 . This is whole-class copybook practice, not marking — if a pupil reverses the order, remind them to count the groups first, then say how many in each group.
5. **Class Challenge.** Pupils take turns at the board matching the pairs with counters; the class confirms each before moving on. Keep it brisk. On the stretch pair, the group-count answer is 5×5 — let pupils who offer other pairs totalling 25 spark a quick talking point rather than a re-teach.
6. **What Did We Notice?.** Ask when they'd rather write a multiplication than the full addition, and push one pupil to name a repeated addition they'd hate to write out — ten 7s, say. Revoice: 'so multiplication is a short way of writing the same repeated adding.'

COMMON MISCONCEPTIONS

⚠ A pupil reads $3 + 3 + 3$ as 3×3 because 'there are threes and a three', matching the number in each group instead of counting the groups.

Point to the three separate 3s on the pan: 'how many lots did we add?' Three lots — so the 3 that comes first in 3×3 here is the count of groups. Use the counters rows so the number of rows is visibly the first number.

⚠ A pupil says $3 + 3 + 3$ and 3×3 must be equal because they look similar, then assumes any two expressions with the same digits are equivalent.

Build both on the beam — this pair happens to level (both 9), but pull up $3 + 3$ versus 3×3 and show the beam tips. Same digits, different value. It's the level beam, not the look, that proves equivalence.

DIFFERENTIATION

EMERGING

- Stay with two-group additions on the beam ($4 + 4 \rightarrow 2 \times 4$) while the class moves to three and four groups; the pupil counts the two pans out loud with you.
- In the copy, let the pupil draw the groups as rows of counters first, then write the multiplication underneath the picture.

DEVELOPING

- After the copy work, ask them to write the same total two ways — 12 as 2×6 and as 3×4 — and check both on the beam.
- Give a missing-number pair: $5 + 5 + 5 = ? \times 5$, then $? + ? + ? = 3 \times 6$.

PROFICIENT

- During Class Challenge, narrate a harder variant aloud: 'find every multiplication that equals 24' — let them list 2×12 , 3×8 , 4×6 and justify each with the group count, then pull them ahead into the Student Activity Book page.

↗ **Cross-curricular:** Tie to PE — pupils count teams of equal size lining up for a relay and write the total as both a repeated addition and a multiplication.

ANSWER KEY

a) 3×5

b) 4×5

c) $6 + 6$

Q1: 3×7

Q2: 4×3

Spot: Three 4s are added, so $4 + 4 + 4 = **3 \times 4** = 12$, not 4×4 . (4×4 would need four 4s.)

EXTENSION SHEET · STRETCH ANSWERS

S1: no, they give different totals

S2: no, they give different totals

S3: yes, both are the same total

S4: no, they give different totals

S5: no, they give different totals