

Multiplication: equal groups and the 2, 4 and 10 tables

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 Hundred Square · challenge, display, explore

WHAT THIS LESSON TEACHES

Multiplying counts how many altogether when every group holds the same number, so 4×2 means four groups of two.

- Four hurleys with two grips each is four groups of two, which is eight grips.
- 8 is a multiple of 4 because you land on it counting 4, 8.

MODEL THIS ON THE BOARD

TEN PAIRS OF GAA BOOTS

- 1 See **10** equal groups of boots.
- 2 Each group holds **2** boots.
- 3 Count in twos: 2, 4, 6, 8, 10, 12, 14, 16, 18, **20**.
- 4 So $10 \times 2 = 20$ boots altogether.

LESSON ARC

Open with four hurleys, each with two grip bands, and get pupils counting in twos before naming it as multiplication. Move to the hundred-square interactive and shade the 2s, then 10s, then 4s. The 4s are the key step: every fours number is also a twos number, and each fours fact is its twos fact doubled. Pupils write the 2s and 4s tables in their copy and ring the overlap. The Class Challenge consolidates the same shading at the board.

TEACHING MOVES

1. **Getting Started.** Show the four hurleys with two grips each. Take three hands-up answers, not open call-outs. When someone says 'two, four, six, eight', re-voice it: 'you counted in twos — that is our short cut for equal groups.'
2. **Watch and Notice.** On the hundred-square interactive, shade one table at a time and clear between each. For the 10s, take a class prediction before you reveal the single column. The 4s are the key step: first ask 'is every fours number already a twos number?' and let them check, then show $2 \times 3 = 6$ beside $4 \times 3 = 12$ to land the doubling.
3. **Try It Together.** Call a fact (4×2 , then 5×10 , then 4×4), send one pupil up to shade the multiples, and have the whole class skip-count aloud to confirm. Watch for pupils counting cells one by one — prompt 'count in twos, don't count each square.' This round is for talking through, not marking.
4. **Write the Tables in Your Copy.** Pupils write the 2s table then the 4s table in full, one fact under the other. Then they ring every 2s answer that also turns up in the 4s (8, 16, 20...). Walk the room glancing at the two neat columns and the rings — that overlap feeds the Class Challenge and the wrap.
5. **Class Challenge.** Keep the board work brisk — pupils take turns shading 2s, 10s, 4s, then 4s again, predicting where the shading lands before each check. On the final round ask 'are the numbers you shaded in the twos too?' and let a pupil name the overlap out loud.

6. What Did We Notice? Pose why every 2s, 4s and 10s answer is even. Listen for 'you keep adding an even amount, so you stay even' and re-voice it. Head off the over-claim that all table answers are even — tie the claim to the 2s, 4s and 10s only.

COMMON MISCONCEPTIONS

⚠ When shading the hundred square, pupils count each cell one by one — 'one, two, three...' — instead of stepping in twos, so multiplication stays hidden as slow counting.

Stop and prompt 'count in twos, don't count each square.' Point only to the shaded numbers as you say them together — 2, 4, 6 — so the jump between groups is what they hear, not the in-between squares.

⚠ Pupils think every times-table answer is even, because the 2s, 4s and 10s all are.

During the wrap, keep the even claim tied to the 2s, 4s and 10s only. Say 'these three tables all step in even jumps — but the 3s and 5s are coming, and they won't all be even.' Don't shade the 3s yet; just plant the doubt.

⚠ Pupils ring an answer in the 4s list but don't believe it's really 'in both tables' — they see two separate lists, not an overlap.

On the hundred square, shade the 4s over the already-shaded 2s so the fours land on squares that are clearly twos-squares. 'You never had to shade a brand-new square — every fours number was already a twos number.'

DIFFERENTIATION

EMERGING

- Stay with the 2s and 10s on the hundred square while the class moves to the 4s; these pupils write only the 2s table in their copy.
- Let them trace the shaded twos with a finger and read the count aloud before writing any facts, so the skip-count comes before the notation.

DEVELOPING

- After the copy work, ask them to write the 10s table too and ring which 10s answers also appear in the 2s.
- Give a missing-number line: 4, 8, __, 16, __ — fill the gaps and say the multiplication fact for each.

PROFICIENT

- Ask: '8 is in both the 2s and the 4s — can you find a number that would be in the 2s, the 4s AND the 10s at once?' Let them hunt on the hundred square and justify why 20 works.
- Have them predict, before shading, what the 8-times table would look like on the hundred square — narrate a harder variant at the board while fast finishers reason it aloud.

➤ **Cross-curricular:** Tie to PE — count the class into pairs, then fours, for a warm-up drill and read off how many groups each gives.

ANSWER KEY

Scaffold: visual check on the page

Q1: 8

Q2: 10

Q3: 12

Q4: 20

Q5: 20

a) Always : Counting in twos, fours or tens always lands on even numbers.

b) Always : Equal groups can be swapped and the product stays the same.

c) Never : The fours go 4, 8, 12 and skip over 10.

d) Sometimes : Numbers like 20 work but 4, 8 or 12 do not.

EXTENSION SHEET · STRETCH ANSWERS

S1: 14 wheels

S2: 24 sliotars

S3: 90 crayons

S4: 32. Four eights are double two eights.

S5: No. $6 \times 4 = 24$ and $7 \times 4 = 28$, so the fours skip 26.

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