

Patterns in the tables and multiples

CURRICULUM ALIGNMENT

ALG.PRR.3a

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

NUM.OPS.3

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

INTERACTIVES **Hundred Square · challenge, display, explore**

WHAT THIS LESSON TEACHES

A multiple is a number you land on when you count in steps of a given number. For example, counting in fours gives 4, 8, 12, 16 and each of these is a multiple of 4.

→ 12 is a multiple of 4 because $4 \text{ times } 3 = 12$.

→ 6 is in both the 2 times table and the 3 times table.

MODEL THIS ON THE BOARD

IS 42 A MULTIPLE OF 6?

- ① The hundred square shows the multiples of 6 shaded: 6, 12, 18, 24, 30, 36, **42**.
- ② We land exactly on **42**, so it is a multiple of 6.
- ③ Check the times fact: $6 \times 7 = 42$.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

DISCUSSION STARTER

REFLECT

Which times-table pattern on the hundred square is easiest for you to spot?

LESSON ARC

Open with the hundred-square interactive showing multiples of 5 already shaded — pupils name the shape before naming the rule. Model four tables in turn (2s, 10s, 5s, 3s), saving the slanting 3s for last so the ten-wide pivot lands. Pupils shade-and-predict together at the board, then ring the units digits of the 4-times row in copybook. Class Challenge is a common-multiple hunt on the grid.

TEACHING MOVES

1. **Getting Started.** Show the multiples-of-5 grid already shaded and hold five seconds of quiet think-time before any hands. Take three answers — steer toward 'they all end in 0 or 5' AND 'they make two straight columns'; park the columns comment, it's the spine of the whole lesson.
2. **Watch and Notice.** Run the four grids in the fixed order — 2s, 10s, 5s, then 3s last. Before revealing the 3s slant, ask 'the tens ran straight down; predict what the threes will do.' Let a wrong prediction stand, then reveal and draw out that landing three-along drifts sideways on a ten-wide grid.
3. **Try It Together.** Keep a strict 'predict, then shade' rhythm — the class calls the next number aloud before the pupil at the board shades it; the interactive won't reveal on its own. On the 9s, prompt them to spot the near-vertical slant stepping one place left each row. Wrong predictions are fine — say so.

4. **Ring the Units Pattern in Your Copy.** Pupils write the first ten multiples of 4 and ring each units digit. Walk the row glancing for anyone stalled — prompt them to say the units digit aloud as they write. This is a copybook moment, not marking; look for pupils spotting the 4-8-2-6-0 cycle running down the ringed digits.
5. **Class Challenge.** Brisk turns at the board, class confirms each answer before moving on — don't re-explain. For 'in both 2s and 3s' nudge that these are the multiples of 6; for the triple-table hunt accept any of 12, 24, 36, 48 and ask the pupil to name the three tables it sits in.
6. **What Did We Notice?.** Display-only talk. Listen for pupils tying the shape to the grid width. Revoice one strong answer: 'so ten fits the width exactly and lands you straight below, but three doesn't fit — so each row drifts sideways.'

COMMON MISCONCEPTIONS

⚠ A pupil predicts the next multiple of 4 by counting on 'one, two, three, four' cells rather than reading it as a whole number — so they lose their place and mis-shade around 28 or 36.

Pause the board work and have the whole class say the 4-times facts in unison up to the target number, then shade. Anchor the count to the fact ($4 \times 7 = 28$), not to counting cells one by one.

⚠ Asked for a multiple of 5 that is NOT a multiple of 10, a pupil offers 20 or 30 — they read 'multiple of 5' and grab the nearest shaded number without checking the 'not 10' condition.

On the grid, shade the 5s in one colour and overlay the 10s in another. The numbers with only one colour (5, 15, 25...) are the answers. Have the pupil point to a single-colour cell and say why 30 fails the test.

DIFFERENTIATION

EMERGING

- Stay with the 2s, 5s and 10s on the board — the straight-column tables — while the class moves to the slanting 3s and 9s. Pupils mirror the tidy columns in their copybook.
- For the copybook ring, pre-write the ten multiples of 4 so pupils only ring the units digit, not generate the row.

DEVELOPING

- After the 3s slant, ask which OTHER tables slant and which run straight — get them to sort 4s, 6s, 9s into 'straight' or 'slant' before shading confirms it.
- On the copybook row, ask why the ringed digits repeat every five numbers (4, 8, 2, 6, 0) — what is it about 4 and 10 that makes the cycle length five?

PROFICIENT

- Pose: 'Which times table would make a straight column on a grid that is NINE wide instead of ten?' Let them reason it out in copybook before anyone shades — the answer isn't the one they expect.

✂ **Cross-curricular:** Tie to art — pupils overlay two coloured table-patterns on a blank hundred square to make a common-multiple design, like a repeating textile print.

ANSWER KEY

Scaffold: visual check on the page

Q1: Yes

Q2: 4, 8, 12, 16, 20, 24

Q3: Yes

Q4: 12, 24, 36, 48, 60

a) Always : Every ten is made of two fives, so 10, 20, 30 all land in the fives too.

b) Sometimes : 8 and 16 are, but 4, 12 and 20 are not.

c) Always : Counting in fives always ends in 5 then 0, over and over.

d) Sometimes : 6 and 12 are, but 3, 9 and 15 are not.

EXTENSION SHEET · STRETCH ANSWERS

S1: 25

S2: 75

S3: 21

S4: 64

S5: 53