

Written subtraction of 4-digit numbers

CURRICULUM ALIGNMENT

NUM.OPS.3

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

INTERACTIVES **Column Subtraction · challenge, display** **Word Problem · challenge**

WHAT THIS LESSON TEACHES

To subtract 4-digit numbers, line up thousands, hundreds, tens and units. Work from the right, and when a column is too small to take from, rename one from the column on its left as ten in the current column. If that column is a zero, the borrow keeps travelling left, turning each 0 into a 9.

→ $4,253 - 1,678 = 2,575$ (check: $2,575 + 1,678 = 4,253$)

→ $5,000 - 2,648 = 2,352$

MODEL THIS ON THE BOARD

WRITTEN SUBTRACTION ACROSS ZEROS

- 1 Set out **5002** – **2347** in Th H T U columns.
- 2 Units cannot take 7, so rename from the thousands: hundreds and tens become **9**, units become **12**.
- 3 Subtract down each column: $12 - 7 = 5$, $9 - 4 = 5$, $9 - 3 = 6$, $4 - 2 = 2$.

$$\begin{array}{r}
 \begin{array}{cccc}
 4 & 9 & 9 & 12 \\
 \cancel{5} & \cancel{0} & \cancel{0} & \cancel{2} \\
 - & 2 & 3 & 4 & 7 \\
 \hline
 2 & 6 & 5 & 5
 \end{array}
 \end{array}$$

DISCUSSION STARTER

REFLECT Which rename was trickiest — across a zero, or in more than one column?

ANSWER KEY

a) 3687

b) 3158

c) 3407

Q1: 3,324 fans

Q2: 1,834 tickets

Q3: 4,160

Q4: 2,558

a) **Sometimes** : You only rename when a column has too few to take from, such as $4,253 - 1,678$, but not for $4,568 - 1,234$.

b) **Always** : Each empty column cannot give and passes the borrow on, turning each 0 into a 9.

c) **Always** : This check works every time a subtraction is done correctly, as in $2,575 + 1,678 = 4,253$.

d) **Never** : Taking a number away always leaves less than the larger number you began with.

EXTENSION SHEET · STRETCH ANSWERS

S1: 3943

S2: 2988

S3: 5644

S4: 264

S5: 237

Investigation: How many renames? — open-ended; scan pupils' working for valid solution paths rather than a single answer.