

Mental strategies for multiplication and division

CURRICULUM ALIGNMENT

NUM.OPS.4

build upon, select and make use of a range of operation strategies.

INTERACTIVES **Function Machine** · challenge, display, explore

WHAT THIS LESSON TEACHES

In a multiplication, double one factor and halve the other; the product stays the same because multiplying by 2 and dividing by 2 cancel each other out, but the numbers become friendlier to work with mentally.

→ 25×16 becomes $50 \times 8 = 400$.

→ 6×99 becomes $6 \times 100 = 600$, then subtract 6 to give 594.

MODEL THIS ON THE BOARD

DOUBLE AND HALVE TO MULTIPLY

- 1 Start with 25×16 .
- 2 Double 25 to make **50** and halve 16 to make **8**.
- 3 Now work out 50×8 .
- 4 $50 \times 8 = 400$.

ANSWER KEY

b) $6 \times 99 = 594$ (compensate)c) $144 \div 8 = 18$ (halve twice)

Q1: 810

Q2: 490

Q3: 420

Q4: 24

a) Always : Multiplying by 2 and dividing by 2 cancel exactly.

b) Always : 8 equals $2 \times 2 \times 2$ so three halvings divide by 8.

c) Sometimes : It works when the number is close to a round number like 100.

d) Never : Partitioning keeps the value exactly the same.

EXTENSION SHEET · STRETCH ANSWERS

S1: 889.3

S2: 433.3

S3: 362.1

S4: 961.1

S5: 65844