



Preliminary Planning Sheet Grade 4 - Tile Border

Domain(s)

Operations and Algebraic Thinking

Standard(s)

4.OA.A.3

Mathematical Practices

MP.1 MP.3 MP.4 MP.6 MP.7

Major Underlying Mathematical Concepts

- Solve multi-step word problems where remainders must be interpreted
- Number sense to 189
- Equations

Problem Solving Strategies

- Model
- Diagram/Key
- Equations
- Table
- Number line
- Graph

Formal Mathematical Language and Symbolic Notation

- Model
- Diagram/Key
- Table
- Number line
- Remainder
- Graph
- Axis
- Input/Output
- Total/Sum
- Per
- Dozen
- Gross
- Greater than (>)
- Product
- Quotient
- Divisor
- Divided
- Even
- Variable
- Equations
- Row
- Rule
- Multiples

Possible Solution(s)

Mrs. Garcia needs 189 tiles. 24 boxes of tiles are needed.

Rule
r is row
b is box
t is total tiles
$63 \cdot r = t$
$8 \cdot b = t$

Rows	Tiles Per Row	Total Tiles
1	63	63
2	63	126
3	63	189

$$\begin{array}{r} 3 \times 63 = \\ 3 \times 60 = 180 \\ 3 \times 3 = + 9 \\ \hline 189 \end{array}$$

Box	Total Tiles
1	8
2	16
3	24
↓	
10	80
↓	
20	160
21	168
22	176
23	184
24	192

$$\begin{array}{r} 23 \text{ r } 5 \text{ — } 24 \text{ boxes} \\ 8 \overline{) 189} \\ \underline{- 160} \quad 20 \\ \quad 29 \\ \underline{- 24} \quad 3 \\ \quad 5 \quad 23 \end{array}$$

$$\begin{array}{r} 63 \\ + 63 \\ \hline 126 \end{array}$$

$$126 + 63 = 189$$

$$\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array} \qquad \begin{array}{r} 20 \\ \times 8 \\ \hline 160 \end{array}$$

Possible Connections

Below are some examples of mathematical connections. Your students may discover some that are not on this list.

- Mrs. Garcia will have 3 extra tiles.
- If Mrs. Garcia wants to use all the tiles, she can have 3 rows of 64 tiles.
- The patterns are rows +1, tiles per row +63 (multiples of 63), boxes +1, total tiles +8 (multiples of 8, always even numbers).
- The rules are: $63 \cdot r = t$, $8 \cdot b = t$ (r is row, b is box, t is total tiles).
- Generalize and apply rules to verify answers.
- Relate to a similar task and state a math link.
- Solve more than one way to verify the answer.
- Graph the input/output.
- 2 dozen boxes of tiles are needed.
- More than a gross (144) of tiles are used.