

## Preliminary Planning Sheet Grade 4 – Pencils

### Domain(s)

Number and Operations in Base Ten<sup>1</sup>

### Standard(s)

4.NBT.B.5

### Mathematical Practices

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

### Major Underlying Mathematical Concepts

- Multiplying a whole number by a 1 or 2 digit number
- Division
- Number sense to 288

### Problem Solving Strategies

- Model (manipulatives)
- Diagram/Key
- Table
- Area model for multiplication
- Graph
- Number line

### Formal Mathematical Language and Symbolic Notation

- Model
- Diagram/Key
- Table
- Area model
- Graph
- Number line
- Dozen
- Pattern
- Multiples
- Odd/Even
- Variable
- Rule:  $c \cdot 12 = p$
- Gross
- Per
- Place value

### Possible Solution(s)

Mrs. P will need 288 pencils for next year's class. She should order 2 boxes.

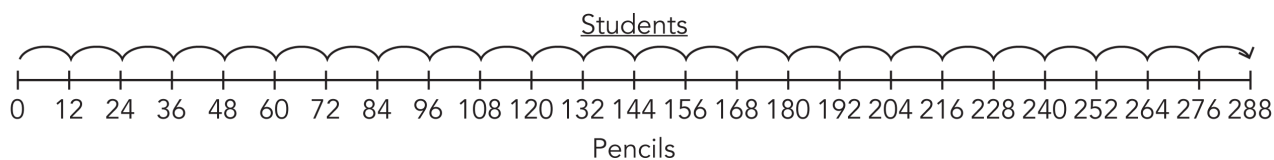
Rule  
**c** is child  
**t** is total pencils  
 $12 \cdot c = t$

Pencils for a Class												
Students	1	2	3	4	5	6	7	8	9	10	...	12
Total Pencils	12	24	36	48	60	72	84	96	108	120	...	288

2 boxes  
 144 | 288 pencils  
 pencils  
 in box

	10	+	2	
20	$20 \times 10 = 200$	$20 \times 2 = 40$		240
+ 4	$4 \times 10 = 40$	$4 \times 2 = 8$		+ 48
				288

$\begin{array}{r} 144 \text{ pencils} \\ \times \quad 2 \text{ boxes} \\ \hline 288 \end{array}$	$\begin{array}{r} 200 + 40 = 240 \\ 40 + 8 = \quad + 48 \\ \hline 288 \text{ students} \end{array}$
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### Possible Connections

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

- Patterns: Students +1, Pencils +12.
- A dozen pencils is 12 pencils.
- A box of pencils is 144 pencils, a gross of pencils or 12 dozen pencils.
- If Mrs. P has more than 2 dozen students next year, she won't have enough pencils. She may want to order a 3rd box.
- Students and pencils are graphed.
- Rule:  $12 \cdot c = t$  (c is child, t is total pencils).
- Relate to a similar task and state a math link.
- Solve more than one way to verify the answer.