

Lesson 10:

Multiply three-and four-digit numbers by three-digit numbers by using the standard algorithm.

CCSS Standard –5.NBT.B.5

FLUENCY (10-min)

Whiteboard Exchange: Divide by 2, 3, or 4



Write the quotient and the remainder. Show your method.

$$84 \div 2 = \underline{\hspace{2cm}}$$

Quotient:

Remainder:

$$\begin{array}{r} 42 \\ \hline 2 \overline{) 84} \\ \underline{- 8} \\ 04 \\ \underline{- 4} \\ 0 \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Divide by 2, 3, or 4



Write the quotient and the remainder. Show your method.

$$96 \div 3 = \underline{\hspace{2cm}}$$

Quotient:

Remainder:

$$\begin{array}{r} 32 \\ 3 \overline{) 96} \\ \underline{- 9} \\ 06 \\ \underline{- 6} \\ 0 \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Divide by 2, 3, or 4



Write the quotient and the remainder. Show your method.

$$76 \div 3 = \underline{\hspace{2cm}}$$

Quotient:

Remainder:

$$\begin{array}{r} 25 \text{ R1} \\ \overline{3 76} \\ \underline{- 6} \\ 16 \\ \underline{- 15} \\ 1 \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Divide by 2, 3, or 4



Write the quotient and the remainder. Show your method.

$$92 \div 4 = \underline{\hspace{2cm}}$$

Quotient:

Remainder:

$$\begin{array}{r} 23 \\ \hline 4 \overline{) 92} \\ \underline{- 8} \\ 12 \\ \underline{- 12} \\ 0 \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Divide by 2, 3, or 4



Write the quotient and the remainder. Show your method.

$$83 \div 4 = \underline{\hspace{2cm}}$$

Quotient:

Remainder:

$$\begin{array}{r} 20 \text{ R}3 \\ \hline 4 \overline{) 83} \\ \underline{- 8} \\ 03 \\ \underline{- 0} \\ 3 \end{array}$$

FLUENCY (10-min)

Choral Response: Exponential to Standard Form

When I give the signal, read the number in exponential form..

| Exponential Form | Standard Form |
|------------------|----------------------|
| 10^1 | <input type="text"/> |
| 10^2 | <input type="text"/> |
| 10^3 | <input type="text"/> |
| 10^4 | <input type="text"/> |
| 10^5 | <input type="text"/> |
| 10^6 | <input type="text"/> |

Now, half of the room will read the EXPONENTIAL FORM and the other half will say the VALUE in standard form.
Ready?

LAUNCH (10-min)

Students test an ancient method of multiplication and compare it with the standard algorithm.



44 x 15

Steps of the Ethiopian Multiplication Method

1. Put one factor in each column.
2. In the halving column, repeatedly divide by 2 (and ignore any remainders) until only the number 1 remains.
3. In the doubling column, repeatedly multiply by 2 until both columns have the same number of rows filled in.
4. Cross out any rows that have an even number in the halving column.
5. Add the remaining numbers in the doubling column.

$$480 + 120 + 60 = 660$$

| | |
|---------------|----------------|
| 44 | 15 |
| 22 | 30 |
| 11 | 60 |
| 5 | 120 |
| 2 | 240 |
| 1 | 480 |

LAUNCH (10-min)

Students test an ancient method of multiplication and compare it with the standard algorithm.



$$\begin{array}{r} 4 4 \\ \times 1 5 \\ \hline 2 2 \\ + 4 4 \\ \hline 6 6 \end{array}$$

| | |
|---------------|----------------|
| 44 | 15 |
| 22 | 30 |
| 11 | 60 |
| 5 | 120 |
| 2 | 240 |
| 1 | 480 |

LEARN (30-min)

Relate the Area Model to the Standard Algorithm

Lisa tiles a rectangular floor that is 204 inches long and 123 inches wide. How many square inches of tile does Lisa use?

Before we use the AREA MODEL and the STANDARD ALGORITHM to solve this problem, let's use our ESTIMATION skills to get a reasonable answer.

$$204 \times 123$$

\approx

$$200 \times 120$$

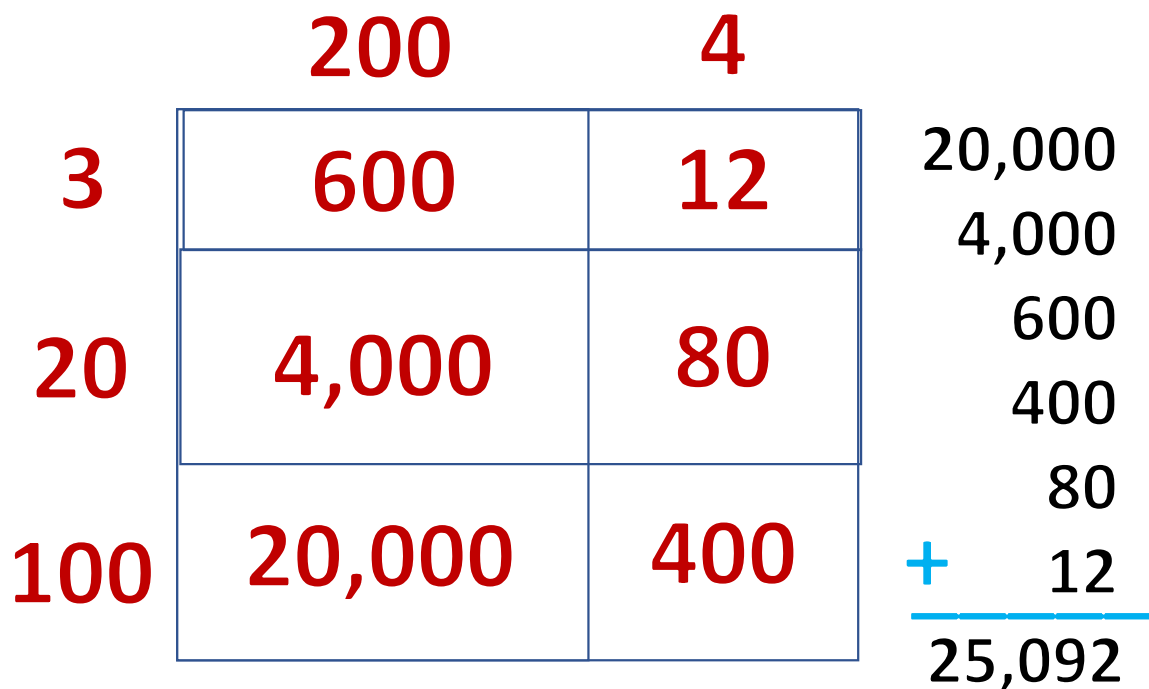
24,000 square inches

LEARN (30-min)

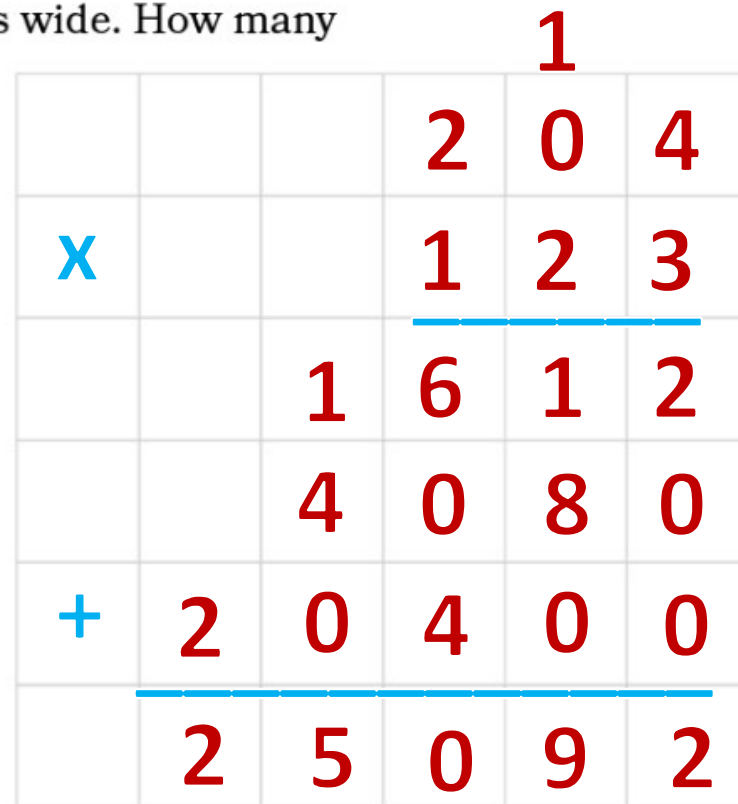
Relate the Area Model to the Standard Algorithm

Lisa tiles a rectangular floor that is 204 inches long and 123 inches wide. How many square inches of tile does Lisa use?

$$204 \times 123$$



Area Model



Standard Algorithm

LEARN (30-min)

Relate the Area Model to the Standard Algorithm

251×432

a.

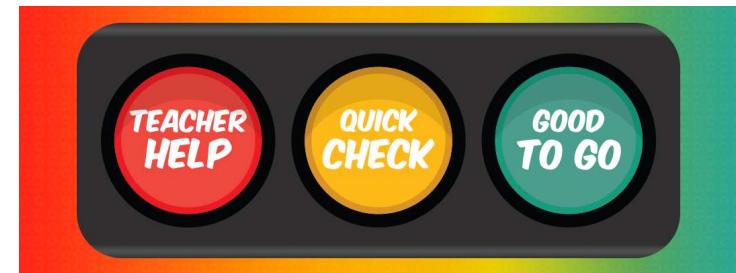
| | | | | |
|-----|--|--------|-------|-----|
| | | 400 | 30 | 2 |
| 1 | | 400 | 30 | 2 |
| 50 | | 20,000 | 1,500 | 100 |
| 200 | | 80,000 | 6,000 | 400 |

b.

| | | | | | |
|---|---|---|-----|---|---|
| | | | 4 | 3 | 2 |
| × | | | 2 | 5 | 1 |
| | | 1 | 4 | 3 | 2 |
| | 2 | 1 | 6 | 0 | 0 |
| + | 8 | 6 | 4 | 0 | 0 |
| | 1 | 0 | 8,4 | 3 | 2 |

LAND (10-min)

Exit Ticket



 **10**

Multiply.

$$704 \times 236$$

Exit Ticket

Small Group Time:

Problem Set Page 89

Homework:

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