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.

$84 \div 2 =$ _____

Quotient: ☐

Remainder: ☐

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

FLUENCY (10-min) **Whiteboard Exchange: Divide by 2, 3, or 4**

Write the quotient and the remainder. Show your method.

$96 \div 3 =$ _____

Quotient: ☐

Remainder: ☐

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

FLUENCY (10-min) **Whiteboard Exchange: Divide by 2, 3, or 4**

Write the quotient and the remainder. Show your method.

$76 \div 3 =$ _____

Quotient: ☐

Remainder: ☐

R1

$$
\begin{array}{r}
25 \\
3\overline{)\,76} \\
-\,6\downarrow \\
\hline
16 \\
-\,15 \\
\hline
1
\end{array}
$$

FLUENCY (10-min) **Whiteboard Exchange: Divide by 2, 3, or 4**

Write the quotient and the remainder. Show your method.

$92 \div 4 =$ _____

Quotient: ☐

Remainder: ☐

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

FLUENCY (10-min) **Whiteboard Exchange: Divide by 2, 3, or 4**

Write the quotient and the remainder. Show your method.

$83 \div 4 =$ _____

Quotient: ☐

Remainder: ☐

$$
\begin{array}{r}
20 \text{ R3} \\
4\overline{)\,83} \\
-\,8\downarrow \\
\hline
03 \\
-\,0 \\
\hline
3
\end{array}
$$

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	
10^2	
10^3	
10^4	
10^5	
10^6	

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.

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

480 + 120 + 60 = 660

LAUNCH (10-min)

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

$$\begin{array}{r} 44 \\ \times\ 15 \\ \hline 220 \\ +\ 440 \\ \hline 660 \end{array}$$

~~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.

$$204 \times 123$$

$$\approx$$

$$200 \times 120$$

$$24{,}000 \text{ square inches}$$

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 x 123

	200	4
3	600	12
20	4,000	80
100	20,000	400

20,000
4,000
600
400
80
\+ 12
25,092

Area Model

				1	
			2	0	4
x			1	2	3
		1	6	1	2
		4	0	8	0
+	2	0	4	0	0
	2	5	0	9	2

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.

			1	1	
			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.

704×236

Exit Ticket

Small Group Time:
Problem Set Page 89

Homework:
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