EUREKA MATH²™

Lesson 8:

Multiply two-and three-digit numbers by two-digit numbers by using the distributive property.

CCSS Standard –5.OA.A.1 / 5.NBT.B.5

one hundred sixteen thousand, three hundred ninety-five = _____

Word Form	Standard Form	Expanded Form
One million, two hundred twenty-three thousand, nine	1,223,009	1,000,000 + 200,000 + 20,000 + 3,000 + 9
Forty-three thousand, nine hundred seventy-one	43,971	40,000 + 3,000 + 900 + 70 + 1
Sixty-three thousand, five hundred eighty-nine	63,589	60,000 + 3,000 + 500 + 80 + 9

three hundred twenty-five thousand, sixty-four = ☐

six hundred thirty thousand, forty = ☐

seven hundred eight thousand, nine = ☐

two million, four hundred fifty-three thousand, one hundred eighty-six = ☐

five million, one hundred thousand, twelve = ☐

eight million, fifty thousand, fifty = ☐

$19,352 \times 3 \approx$ [____] $\times \; 3$

$19,352 \times 3 \approx$ [____]

What is 19,352 rounded to the nearest <u>ten thousand</u>?

*This statement reads "19,352 x 3" is **about** "20,000 x 3". Repeat this statement.*

Now solve for 20,000 x 3

$22,710 \times 4 \approx$ [____] $\times \; 4$

$22,710 \times 4 \approx$ [____]

What is 22,710 rounded to the nearest <u>ten thousand</u>?

*This statement reads "22,710 x 4" is **about** "20,000 x 4". Repeat this statement.*

Now solve for 20,000 x 4

$5 \times 34{,}602 \approx 5 \times \boxed{}$

$5 \times 34{,}602 \approx \boxed{}$

What is 34,602 rounded to the nearest ten thousand?

*This statement reads "5 x 34,602" is **about** "5 x 30,000". Repeat this statement.*

Now solve for 5 x 30,000.

$6 \times 57{,}043 \approx 6 \times \boxed{}$

$6 \times 57{,}043 \approx \boxed{}$

What is 57,043 rounded to the nearest ten thousand?

*This statement reads "6 x 57,043" is **about** "6 x 60,000". Repeat this statement.*

Now solve for 6 x 60,000.

$50{,}862 \times 7 \approx \boxed{} \times 7$

$50{,}862 \times 7 \approx \boxed{}$

What is 50,862 rounded to the nearest <u>ten thousand</u>?

*This statement reads "50,862 x 7" is **about** "50,000 x 7". Repeat this statement.*

Now solve for 50,000 x 7

$8 \times 85{,}004 \approx 8 \times \boxed{}$

$8 \times 85{,}004 \approx \boxed{}$

What is 85,004 rounded to the nearest <u>ten thousand</u>?

*This statement reads "8 x 85,004" is **about** "8 x 90,000". Repeat this statement.*

Now solve for 8 x 90,000

Students solve a word problem involving two-digit by three-digit multiplication.
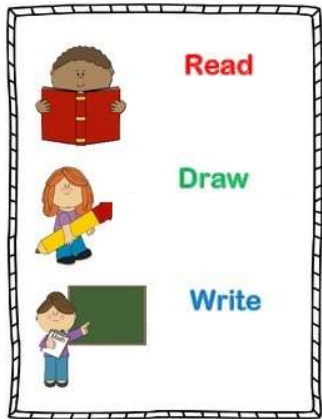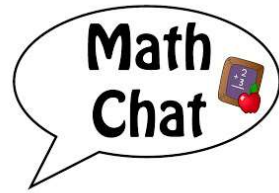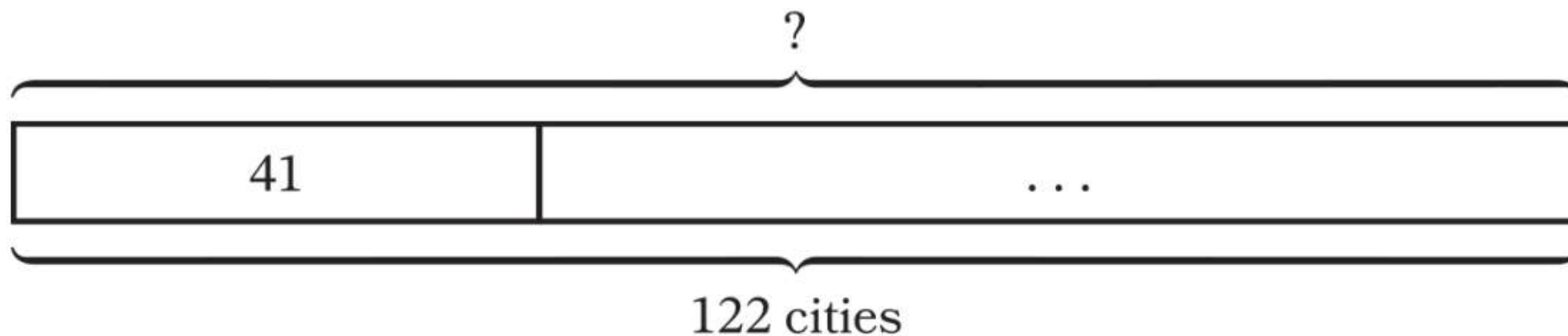
Math Chat

Read

Draw

Write

There are **122 cities** competing in a math relay race. Each city sends **41 grade 5 students** to compete. How many students compete?

I would like you to model this problem using a tape diagram before you solve it.

3 MIN

There are **122 cities** competing in a math relay race.
Each city sends **41 grade 5 students** to compete.
How many students compete?

This is one possible model for the problem.

- *Looking at this model, what is the value of one part?*
- *What does the 122 represent?*
- *What does the 41 represent?*

There are **122 cities** competing in a math relay race.
Each city sends **41 grade 5 students** to compete.
How many students compete?

Here are some possible solutions to this problem:

	40	1	
2	80	2	→ 82
20	800	20	→ 820
100	4,000	100	→ 4,100

```
    82
   820
 +4 100
  ‾‾‾‾‾‾
  5,002
```

$41 \times 122 = (40 + 1) \times (100 + 20 + 2)$
$= (40 \times 100) + (1 \times 100) + (40 \times 20) + (1 \times 20) + (40 \times 2) + (1 \times 2)$
$= 4,000 + 100 + 800 + 20 + 80 + 2$
$= 4,000 + 1,000 + 2$
$= 5,002$

```
        122
   x     41
  ‾‾‾‾‾‾‾‾‾‾
        122
 +    4,880
  ‾‾‾‾‾‾‾‾‾‾
      5,002
```

Relate Vertical Form and the Break Apart and Distribute Method to the Area Model

$24 \times 40 =$ _____

Let's find the product of 24 x 40 by using the distributive property.
*We can interpret this expression as **24 groups of 40** OR **40 groups of 24**.*
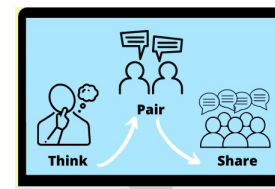*We will use **24 groups of 40**.*

40

160

4
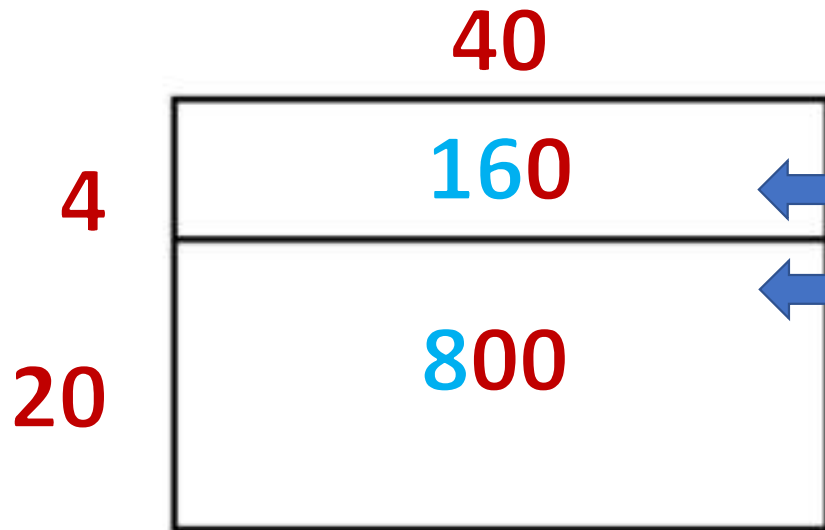
Why are there 2 partial products?

800

20

$$800 + 160 = 960$$

$$\begin{array}{r} 4\ 0 \\ \times\ 2\ 4 \\ \hline 1\ 6\ 0 \\ +\ 8\ 0\ 0 \\ \hline 9\ 6\ 0 \end{array}$$

Relate Vertical Form and the Break Apart and Distribute Method to the Area Model

$$24 \times 40 = (20 + 4) \times 40$$
$$= (20 \times 40) + (4 \times 40)$$
$$= 20 \times 40 + 4 \times 40$$
$$= 800 + 160$$
$$= 960$$

Area Model	Vertical Form	Break Apart & Distribute

Area Model

$24 \times 40 = 960$

40

4 160

20 800
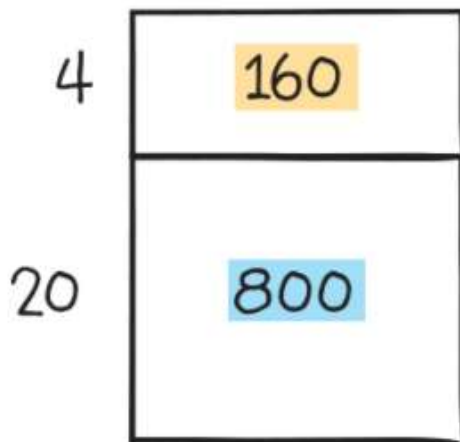
$160 + 800 = 960$

Vertical Form

$$\begin{array}{r} 4\ 0 \\ \times\ 2\ 4 \\ \hline 1\ 6\ 0 \\ +\ 8\ 0\ 0 \\ \hline 9\ 6\ 0 \end{array}$$

Break Apart & Distribute

$40 \times 24 = 40 \times (20 + 4)$
$= (40 \times 20) + (40 \times 4)$
$= 40 \times 20 + 40 \times 4$
$= 800 + 160$
$= 960$

Area Model   -vs-   Vertical Form

$22 \times 41 =$ _____

Relate **Vertical Form** and the **Break Apart and Distribute Method** to the **Area Model**

$22 \times 41 =$ _____
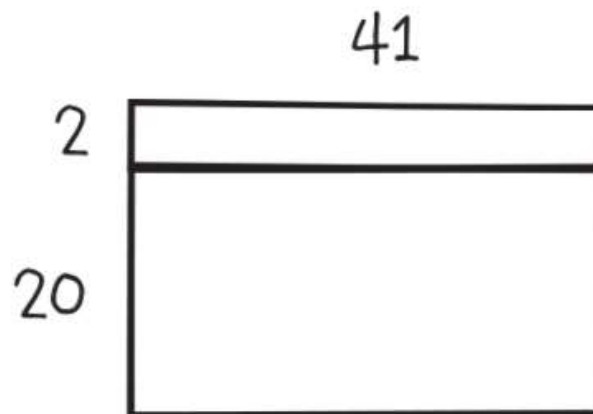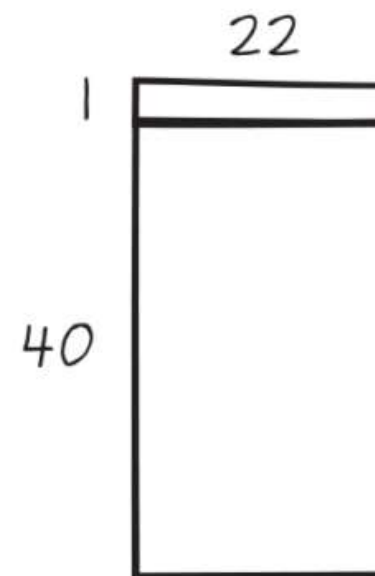
Area Model

Model A

41

2

20

Model B

22

1

40

Area Model   -vs-   Vertical Form

$21 \times 343 = $ _____

Exit Ticket

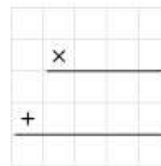TEACHER HELP   QUICK CHECK   GOOD TO GO

8
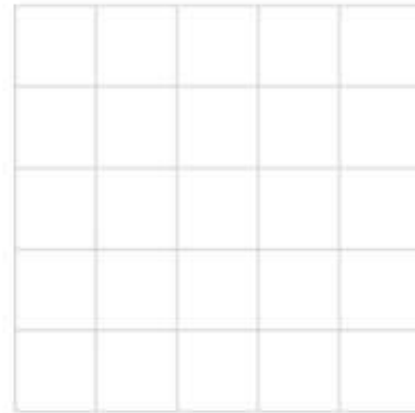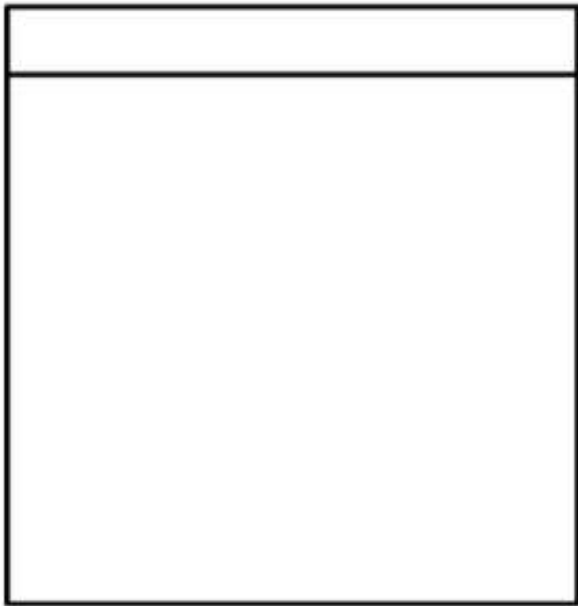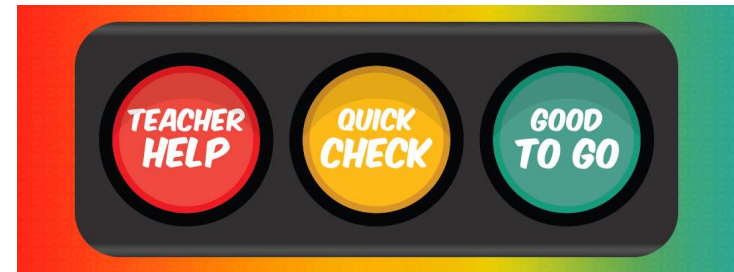
Consider the expression shown.

$$31 \times 213$$

a. Complete the area model.

b. Multiply by showing two partial products.

$$\times$$

$$+$$

c. Complete the equation.

$$31 \times 213 = \underline{\hphantom{xxxx}}$$

Exit Ticket

Small Group Time:
Problem Set Page 69

Homework:
Page 51