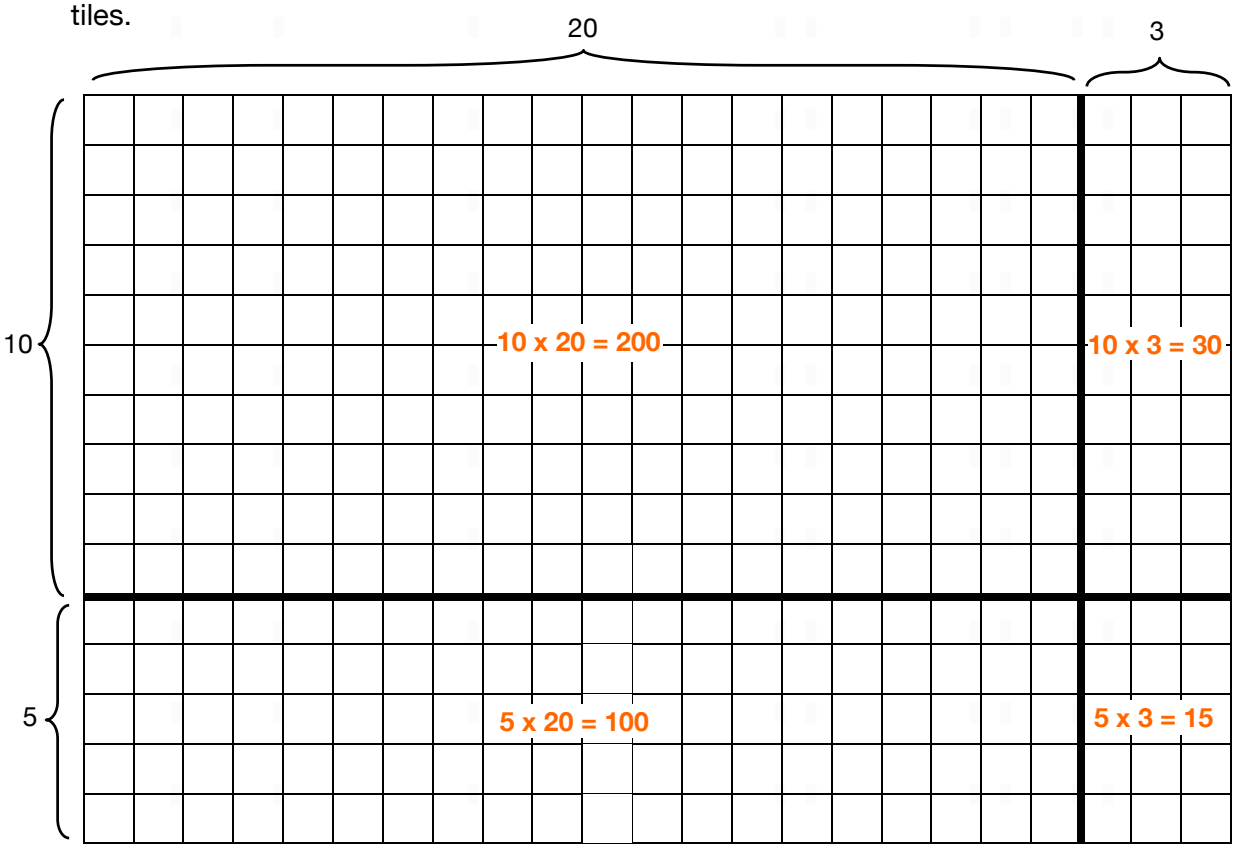
Multiplication Procedure

Use What You've Learned
Answers and Explanations

1. Landon is planning to install vinyl tile in his kitchen and dining area. Each tile is one square foot and he needs enough tiles to cover a floor that measures 15 feet by 23 feet. How many tiles does Landon need to purchase? The following grid represents Landon's floor. Determine the number of tiles it will take to cover each section of the floor and add the results to find the total number of tiles.



15 + 100 = 115
30 + 200 = 230
} 115 + 230 = 345 Landon needs 345 tiles.

Now solve the problem using the paper-and-pencil procedure. Use the model to explain why your answer is correct.

```
  1
  23
x 15
 115  ← 5 x 23 = 115
 230  ← 10 x 23 = 230
 345
```

The bottom five rows of the model represent 5 rows of 23, or 5 x 23. The top ten rows of the model represent 10 rows of 23, or 10 x 23. The sum of the two parts is 345.

Another Way to Record:

```
  23
x 15
  15  ← 5 x 3 = 15
 100  ← 5 x 20 = 100
  30  ← 10 x 3 = 30
 200  ← 10 x 20 = 200
 345
```

Draw an area model to help you solve each of the following problems. You may want to draw a sketch on grid paper. Then record each step you used to solve the problem with paper and pencil.

2. Lydia has piece of poster board that measures 22 inches by 28 inches. What is the area of the poster in square inches?

20 x 20 = 400	20 x 8 = 160
2 x 20 = 40	2 x 8 = 16

1
28
x 22
56 ← 2 x 28 = 56
560 ← 20 x 28 = 560
616

The area of the poster board is 616 square inches.

Another Way to Record:

28
x 22
16 ← 2 x 8 = 16
40 ← 2 x 20 = 40
160 ← 20 x 8 = 160
400 ← 20 x 20 = 400
616

3. Pat, a drummer in his college band, plans to march in the homecoming parade. If the entire band performs, they will march in 13 rows with 24 members in each row. How many members are in the band?

10 x 20 = 200	10 x 4 = 40
3 x 20 = 60	3 x 4 = 12

1
24
x 13
72 ← 3 x 24 = 72
240 ← 10 x 24 = 240
312

The band has 312 members.

Another Way to Record:

24
x 13
12 ← 3 x 4 = 12
60 ← 3 x 20 = 60
40 ← 10 x 4 = 40
200 ← 10 x 20 = 200
312

4. Shelby babysits each Saturday afternoon. Last week she earned $16. Her older brother, Ethan, is a waiter and works every Friday and Saturday evening. Last week he earned 12 times as much money as Shelby. How much money did Ethan make?

10 x 10 = 100	10 x 6 = 60
2 x 10 = 20	2 x 6 = 12

1
16
x 12
32 ← 2 x 16 = 32
160 ← 10 x 16 = 160
192

Ethan earned $192.

Another Way to Record:

16
x 12
12 ← 2 x 6 = 12
20 ← 2 x 10 = 20
60 ← 10 x 6 = 60
100 ← 10 x 10 = 100
192

5. Mariah needs a piece of fabric that measures 37 inches by 25 inches to put on the back of a quilted wall hanging she is making. What is the area of the piece of fabric?

30 x 20 = 600	30 x 5 = 150
7 x 20 = 140	7 x 5 = 35

1 3
25
x 37
175 ← 7 x 25 = 175
750 ← 30 x 25 = 750
925

The area of the fabric is 925 square inches.

Another Way to Record:

25
x 37
35 ← 7 x 5 = 35
140 ← 7 x 20 = 140
150 ← 30 x 5 = 150
600 ← 30 x 20 = 600
925