Multiplying by 2-Digit Numbers

Lesson 5

Anchor Task

The value of $1 was roughly 12 times the value of the South African rand.

How much did the watch cost in South African rand?
Explain.

Let's Learn

1  's method

2 times	200	60	4	264
10 times	1,000	300	20	1,320

$12 \times 132 = 1{,}320 + 264$
$= 1{,}584$

It cost about 1,584 South African rand.

Learning Outcomes:

- To be able to multiply 3-digit numbers by 2-digit numbers

Preparation

Show students the Anchor Task.

Exploration

"In today's lesson, we are going to find out how much the watch cost in South African rand. Talk to each other about your methods to find the cost of the watch."

Discussion

Review the problem:

- How much is $1 in South African rand?
- How do you calculate the cost of the watch in South African rand?
- Is there more than one method of calculating?

Sharing and presenting:

Have the students share their methods on how to calculate the cost of the watch in South African rand.

Anticipated responses:

Students may use the standard column method to calculate while some may split 12 into 10 and 2 and multiply each number by 132 before adding the products to get the answer. Some students may make use of 12 × 32 to calculate
12 × 132.

Formalizing the discussion

- Invite students to share their methods on how they calculate the cost of the watch in South African rand.
- Write down the different methods on the whiteboard.
- **Prompt students with Method 1:** My friend said that he can use the standard column method to work out the answer. How does it work?
- **Prompt students with Method 2:**
  - My friend said that using a number bond to split 12 into 10 and 2 might help. How does he know?
  - What is 2 × 132 and 10 × 132?
  - Should we sum up the products or multiply them?
  - Can we split 12 into other numbers?
- **Prompt students with Method 3:**
  - Can we use number bonds to split 132? How should we split it?
  - My friend said that making use of 12 × 32 can work out the answer for 12 × 132. Why is this possible?

Board Plan

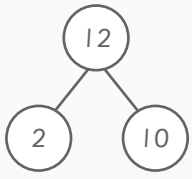
Lesson 5 Multiplying by 2-Digit Numbers Date: _____

Method 1

$$\begin{array}{r} 132 \\ \times\ 12 \\ \hline 264 \\ +1,320 \\ \hline 1,584 \end{array}$$

132 × 12 = 1,584

Method 2

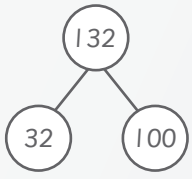


2 × 132 = 264

10 × 132 = 1,320

264 + 1,320 = 1,584

Method 3



12 × 32 = 384

12 × 100 = 1,200

384 + 1,200 = 1,584

Suggestion for Journal

Title: Multiplying by 2-Digit Numbers Date: _____

Suggestion

Say: Use two different methods to calculate 140 × 26.

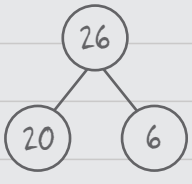
Student's work:

Method 1

$$\begin{array}{r} {\scriptstyle 2\ \ } \\ 140 \\ \times\ 26 \\ \hline {\scriptstyle 1}\ 840 \\ +2,800 \\ \hline 3,640 \end{array}$$

140 × 26 = 3,640

Method 2



140 × 20 = 2,800

140 × 6 = 840

140 × 26 = 2,800 + 840 = 3,640

Differentiated Teaching

Supporting Struggling Learners

- Students might have difficulty multiplying a 3-digit number by a 2-digit number. They may find it confusing and write the number in the wrong place values when the tens in the 2-digit number is multiplied by the ones in the 3-digit number.
- Guide students on the proper steps to multiply by a 2-digit number by using the example in the Anchor Task.
  Step 1: Multiply the ones. What is 2 ones × 2?
  Step 2: Multiply the tens. What is 3 tens × 2?
  Step 3: Multiply the hundreds. What is 1 hundred × 2?
  Step 4: Repeat steps 1 to 3, using the 1 in the tens place. Numbers should be written from tens followed by hundreds then thousands.

Challenging Advanced Learners

Suggestion 1:

Get them to solve a question like multiplying a 4-digit number by a 2-digit number.
For example:
Solve the expression 1,234 × 14.

Suggestion 2:

Write a note to a friend who is absent on which method can lead to the answer easily and explain why.

Multiplying by 2-Digit Numbers

Lesson 5

Anchor Task

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How much did the watch cost in South African rand? Explain.

Let's Learn

1  's method

2 times	200	60	4	264
10 times	1,000	300	20	1,320

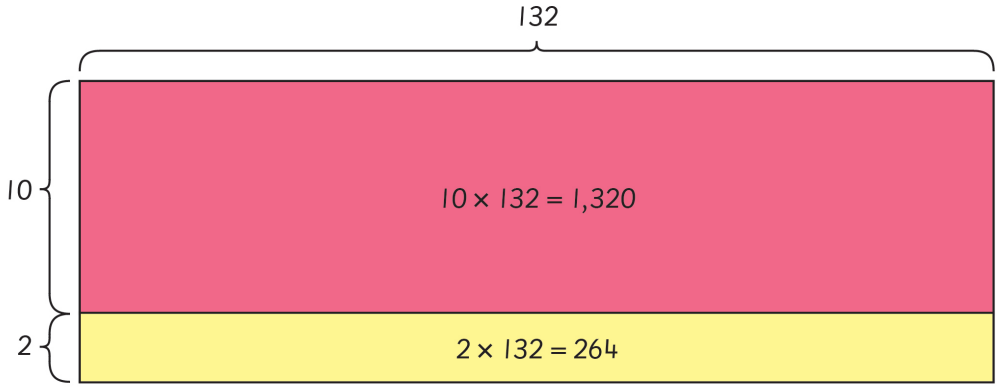
$12 \times 132 = 1{,}320 + 264$
$= 1{,}584$

It cost about 1,584 South African rand.

Let's Learn

- Compare the methods the students shared with the ones in the book.
- **Prompt students by asking:**
  - They split 12 into 2 and 10. Did we?
  - They made a table to calculate the products for each place value. Did we?
  - They multiplied 100 by 2 to get 200. Did we?
  - They multiplied 30 by 2 to get 60. Did we?
  - They multiplied 2 by 2 to get 4. Did we?
  - They summed up the products to get 264. Did we?
  - They multiplied 100 by 10 to get 1,000. Did we?
  - They multiplied 30 by 10 to get 300. Did we?
  - They multiplied 2 by 10 to get 20. Did we?
  - They summed up the products to get 1,320. Did we?
  - They wrote the equation '12 × 132 = 1,320 + 264'. Did we?
  - They also wrote the equation '1,320 + 264 = 1,584'. Did we?
  - They wrote the statement 'It costs about 1,584 South African rand.' Did we?
  - The answer is 1,584. Do you agree?

2  's method



$12 \times 132 = 1{,}320 + 264$

$= 1{,}584$

 cost about 1,584 South African rand.

3  's method

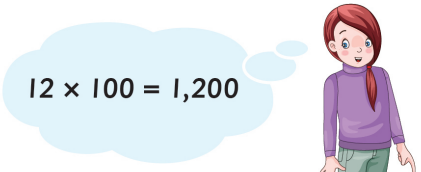
```
   1 3 2
×    1 2
-------
   2 6 4   → multiply by 2
+ 1,3 2 0  → multiply by 10
-------
  1,5 8 4
-------
```

 cost about 1,584 South African rand.

Let's Learn

- **Continue with Let's Learn 2 and ask:**
  - *They drew a model to represent the expression. Did we?*
  - *They labelled the model's length and width. Did we?*
  - *They wrote the equation '10 × 132 = 1,320'. Did we?*
  - *They wrote the equation '2 × 132 = 264'. Did we?*
  - *They wrote the equation '12 × 132 = 1,320 + 264'. Did we?*
  - *They also wrote the equation '1,320 + 264 = 1,584'. Did we?*
  - *They wrote the statement 'Watch costs about 1,584 South African rand.' Did we?*
  - *The answer is 1,584. Do you agree?*
- **Continue with Let's Learn 3 and ask:**
  - *They used a standard column method to solve the question. Did we?*
  - *They multiplied 132 by 2 first to get 264. Did we?*
  - *How do they multiply to get 264?*
  - *They multiplied 132 by 10 next to get 1,320. Did we?*
  - *How do they multiply to get 1,320?*
  - *They wrote the statement 'Watch costs about 1,584 South African rand.' Did we?*

4  's method



$$\begin{array}{r} 1\ 2 \\ \times\ \ 3\ 2 \\ \hline 2\ 4 \\ +\ 3\ 6\ 0 \\ \hline 3\ 8\ 4 \end{array}$$

$12 \times 132 = 1{,}200 + 384$

$= 1{,}584$

 cost about 1,584 South African rand.

Guided Practice

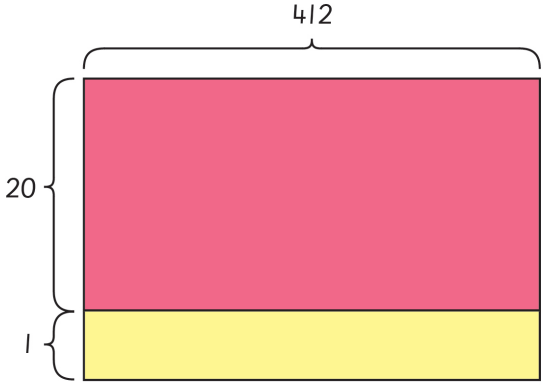
1 Multiply.

$412 \times 21 =$ 8,652

412 × 10 = 4,120

412 × 20 = 8,240

412 × 1 = 412



Let's Learn

- **Continue with Let's Learn 4 and ask:**
  - Penny thought of the equation '12 × 100 = 1,200'. Did we?
  - Why did she think of that?
  - They used standard column method to multiply 12 by 32. Did we?
  - Where did the 32 come from?
  - How did they get 24 and 360?
  - They got 384 as the product from the multiplication of 12 and 32. Is it correct?
  - They wrote the equation '12 × 132 = 1,200 + 384'. Did we?
  - They also wrote the equation '1,200 + 384 = 1,584'. Did we?
  - They wrote the statement 'Watch costs about 1,584 South African rand.' Did we?

Common error(s):

While doing the standard column method, some students may do this:

$$\begin{array}{r} 132 \\ \times\ \ 12 \\ \hline 264 \\ +132 \\ \hline 396 \end{array}$$

Solution: Remind students that when they multiply the tens in the 2-digit number, they should write the product starting from the tens place with the digit '0' written in the ones place.

Guided Practice

- This practice reinforces the learning of multiplying 3-digit numbers by a 2-digit number by using a diagram.
- Recap on decomposing the 2-digit number, 21 into 20 and 1. Further decompose the number 20 into 10 and 2. This will help the students to multiply the 3-digit number by 10 easily.
- Remind the students to add the products after multiplying the 3-digit number by 20 and 1.
- **Ask:** Can we show the decomposition of 21 into 10, 10 and 1 in the diagram? How will it look like?

2 Multiply.

$13 \times 213 =$ 2,769

	2	1	3	
×		1	3	
	6	3	9	→ multiply by 3
+	2,	1	3	0 → multiply by 10
	2,	7	6	9

$10 \times 213 =$ 2,130

$3 \times 213 =$ 639

Is this a good estimate?

$10 \times 210 =$ 2,100

3 Find the product of 14 and 121.

$14 \times 121 =$ 1,694

		1	4
×	2	1	
		1	4
+	2	8	0
	2	9	4

Let's estimate.

$10 \times 120 =$ 1,200

$5 \times 120 =$ 600

$15 \times 120 =$ 1,800

$14 \times 100 =$ 1,400

Is this estimate better than  's ?

Complete Worksheet 5 • Pages 22 to 23

Guided Practice

- This practice reinforces the learning of multiplying 3-digit numbers by a 2-digit number by using standard column method.
- Recap on the steps to multiply
  Step 1: Multiply the ones first
  Step 2: Multiply the tens
  Step 3: Multiply the hundreds
- Remind students that when we multiply by the digit in the tens place in the 2-digit number, we have to write the digit '0' in the ones place before we write the product.
- **Ask:** Why do we estimate the product of the numbers we multiply?

Differentiated Teaching

Supporting Struggling Learners

- **For Question 1, prompt students by asking:**
  - What is 10 × 213?
  - What is 3 × 213?
  - Where did the 10 and 3 come from?
  - What do you notice about the expressions and the standard column method?

Challenging Advanced Learners

Suggestion 1:

Solve the questions using other methods and compare which method is the fastest to arrive at the solution.

Suggestion 2:

Write a note to a friend who is absent to explain why estimations are used and what makes a good estimation.

Assessment Checklist

Performance	Question(s)	Action
Can the student multiply by splitting up the 2-digit number?	1	This question requires students to solve the multiplication equation by splitting up the 2-digit number. Guide students to add the products which are found to solve the question.
Can the student multiply a 3-digit number by a 2-digit number using the standard column method?	2	This question requires students to solve the multiplication equation by using the standard column method. Recap the steps with students. Step 1: Using the ones in the 2-digit number, multiply the ones in the 3-digit number. Step 2: Multiply the tens Step 3: Multiply the hundreds Step 4: Using the tens in the 2-digit number, multiply the ones in the 3-digit number. Step 5: Multiply the tens Step 6: Multiply the hundreds Step 7: Add the products

Name: _____ Date: _____

Worksheet 5

Multiplying by 2-Digit Numbers

1 Multiply and fill in the blanks.

(a) $12 \times 212 =$ [?]

$10 \times 212 = 2{,}120$

$2 \times 212 = 424$

$12 \times 212 = 2{,}120 + 424 =$ [2,544]

(b) $13 \times 321 =$ [?]

$10 \times 321 = 3{,}210$

$3 \times 321 = 963$

$13 \times 321 =$ [3,210] + [963] = [4,173]

(c) $14 \times 112 =$ [?]

$10 \times 112 = 1{,}120$

$4 \times 112 = 448$

$14 \times 112 =$ [4,173] + [448] = [1,568]

2 Use this method to find the products of the following.

$13 \times 221 =$?

$13 \times 221 =$ 2,873

	2	2	1	
×		1	3	
	6	6	3	⟶ 3×221
2,	2	1	0	⟶ 10×221
2,	8	7	3	

(a) $12 \times 212 =$?

$12 \times 212 =$ 2,544

	2	1	2
×		1	2
	4	2	4
2,	1	2	0
2,	5	4	4

(b) $13 \times 211 =$?

$13 \times 211 =$ 2,743

	2	1	1
×		1	3
	6	3	3
2,	1	1	0
2,	7	4	3

NOTES

Multiplying by 2-Digit Numbers

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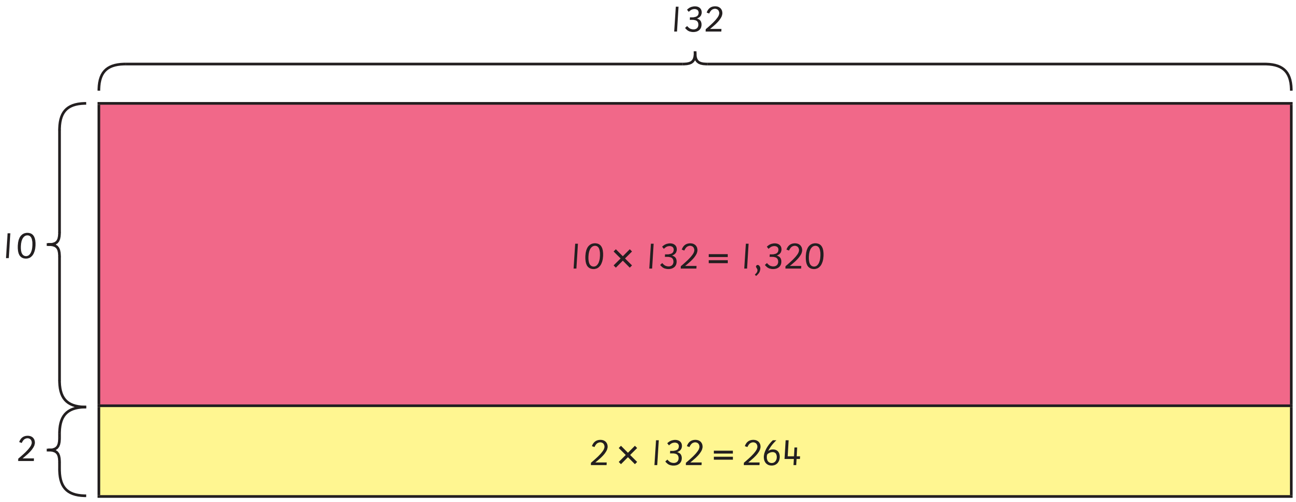
$= 1{,}584$

It cost about 1,584 South African rand.

2  's method



$12 \times 132 = 1{,}320 + 264$

$= 1{,}584$

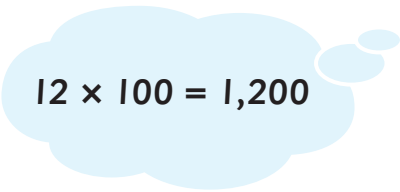
 cost about 1,584 South African rand.

3  's method

	1 3 2	
×	1 2	
	2 6 4	→ multiply by 2
+	1, 3 2 0	→ multiply by 10
	1, 5 8 4	

 cost about 1,584 South African rand.

4  's method



$$\begin{array}{r} 1\ 2 \\ \times\ \ 3\ 2 \\ \hline 2\ 4 \\ +\ 3\ 6\ 0 \\ \hline 3\ 8\ 4 \\ \hline \end{array}$$

$12 \times 132 = 1{,}200 + 384$

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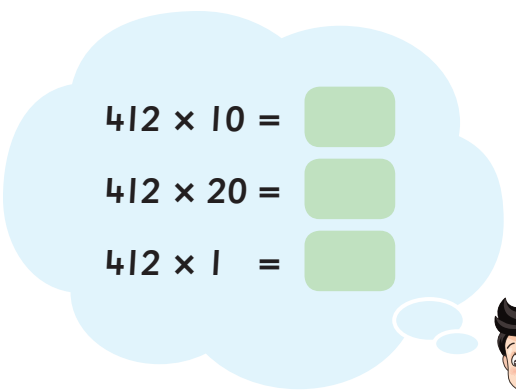
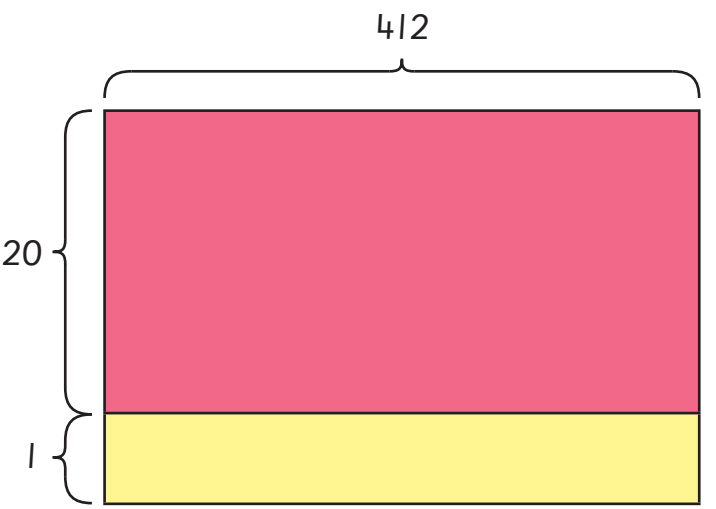
Guided Practice

1 Multiply.

$412 \times 21 =$ ☐





2 Multiply.

$13 \times 213 =$ ☐

$10 \times 213 =$ ☐

$3 \times 213 =$ ☐

	2	1	3
×		1	3
	☐	☐	☐ → multiply by 3
+	☐	☐	☐ ☐ → multiply by 10

Is this a good estimate?

$10 \times 210 =$ ☐

3 Find the product of 14 and 121.

$14 \times 121 =$ ☐

Let's estimate.

$10 \times 120 =$ ☐

$5 \times 120 =$ ☐

$15 \times 120 =$ ☐

		1	4
×		2	1
		☐	☐
+	☐	☐	☐
	☐	☐	☐

$14 \times 100 =$ ☐

Is this estimate better than  's ?

Complete Worksheet **5** • Pages **22** to **23**

Name: _____ Date: _____

Worksheet 5

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1 Multiply and fill in the blanks.

(a) $12 \times 212 =$?

$10 \times 212 = 2{,}120$

$2 \times 212 = 424$

$12 \times 212 = 2{,}120 + 424 =$ ____

(b) $13 \times 321 =$?

$10 \times 321 = 3{,}210$

$3 \times 321 = 963$

$13 \times 321 =$ ____ + ____ = ____

(c) $14 \times 112 =$?

$10 \times 112 = 1{,}120$

$4 \times 112 = 448$

$14 \times 112 =$ ____ + ____ = ____

2 *Use this method to find the products of the following.*

$13 \times 221 =$?

$13 \times 221 =$ 2,873

	2	2	1	
×		1	3	
	6	6	3	⟶ 3×221
2,	2	1	0	⟶ 10×221
2,	8	7	3	

(a) $12 \times 212 =$?

$12 \times 212 =$

	2	1	2
×		1	2

(b) $13 \times 211 =$?

$13 \times 211 =$

	2	1	1
×		1	3