**Unit 10**

Name: _____          **Lesson 10.1**          **Grade 5A**

Date: _____          **Multiplication**          **Study sheet**

## Definition of Estimating

Estimating means finding an approximate answer that is close to the exact value. We use estimation to make calculations quicker and to check if an exact answer seems reasonable.

## How to Estimate When Multiplying Numbers

When multiplying numbers (especially large ones), we **round** one or both numbers to make the math easier.

For example:
If you're multiplying numbers up to **10,000** by **1- or 2-digit numbers**, underline these steps:

1.Round each number to the highest place value.

2.Multiply the numbers together.

3.The number of 0s in the product should be the number of the 0s in both factors together.

## Example

Estimate: 4,672 × 9

- Round 4,672 to 5,000 (nearest thousand)

- Multiply: 5,000 × 9 = 45,000
  ✅ So, **the estimated answer is about 45,000**

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## Practice Questions

Try estimating the following:

1) $3,845 \times 7$

2) $9,216 \times 18$

3) $5,430 \times 12$

4) $7,092 \times 9$

5) $2,678 \times 24$

- Round smartly – Look at the numbers and decide what makes the math easier.

- If the number is 4,672 → round to 5,000 (nearest thousand).
- If the number is 56 → round to 60 (nearest ten).

- Use friendly numbers – Pick numbers that are easy to multiply in your head (like 10, 20, 50, 100, 1,000).

- Sometimes rounding both makes it less accurate.

Multiplying whole numbers up to 10,000 by 1 and 2 digit numbers.

## 💡 What It Means

Multiplying whole numbers means adding a number to itself many times.
Example:
4×3=4+4+4=12

When we multiply big numbers, we use place value and written methods to keep it organized.

## Multiplying whole numbers up to 10,000 by 1-digit numbers.

## Column method

## Example:

3,427 × 6

Step 1: Write it in column form:

$$
\begin{array}{r}
3,427 \\
\times \quad 6 \\
\hline
\end{array}
$$

**Step 2:** Multiply each digit (starting from the ones place):

- 6 × 7 = **42** → write 2, carry 4
- 6 × 2 = **12**, + 4 = **16** → write 6, carry 1
- 6 × 4 = **24**, + 1 = **25** → write 5, carry 2
- 6 × 3 = **18**, + 2 = **20**

Final Answer:
→ 20,562

✅ 3,427 × 6 = 20,562

## Breaking down method

### 💡 What's the Breaking Down Method?

You **break** the big number into **thousands, hundreds, tens, and ones**, multiply each part by the 1-digit number, and then **add** all the answers together.

### Example 1:

4,236 × 5

**Step 1: Break the 4-digit number into parts**
→ 4,236 = 4,000 + 200 + 30 + 6

**Step 2: Multiply each part by 5**

- 4,000 × 5 = 20,000

- 200 × 5 = 1,000

- 30 × 5 = 150

- 6 × 5 = 30

**Step 3: Add them all together**
20,000 + 1,000 + 150 + 30 = **21,180**

✅ Answer: 4,236 × 5 = 21,180

### Example 2:

3,412 × 6

**Break it down:** 3,000 + 400 + 10 + 2

Multiply each by 6:

- 3,000 × 6 = 18,000

- 400 × 6 = 2,400

- 10 × 6 = 60
- 2 × 6 = 12

Add them up:

18,000 + 2,400 + 60 + 12 = **20,472**

✓ **3,412 × 6 = 20,472**

**Q1:** Multiply the following using the **column method.**

a) 3,482 × 6

b) 5,307 × 8

**Q2:** Multiply the following using the **breaking down method**.

a) 4,216 × 7

b) 3,504 × 9

## Multiplying whole numbers up to 10,000 by 2-digit numbers.

## Column method

When you multiply a 4-digit number by a 2-digit number, you can use the long multiplication method.

## Steps:

1. **Write the numbers** so the digits line up — the bigger number on top (the 4-digit one) and the smaller (2-digit) number below it.
   Example:

$$
\begin{array}{r}
1234 \\
\times \quad 12 \\
\hline
\end{array}
$$

2. **Multiply the top number by the ones digit** of the bottom number.

- 1234 × 2 = 2468
  (Write this as your first line.)

3. **Multiply the top number by the tens digit** of the bottom number.

- 1234 × 1 (but this 1 is really 10, so you add a zero at the end!)

- 1234 × 10 = 12340
  (Write this as your second line, shifted one place to the left.)

4. **Add the two results together:**

$$
\begin{array}{r}
2468 \\
+ \quad 12340 \\
\hline
14808
\end{array}
$$

✅ So, 1234 × 12 = 14,808

<u>Breaking down method</u>

Example: Multiply 4321 × 23 using decomposition.

<u>Step 1: Decompose the 2-digit number</u>

Break 23 into 20 + 3.

4321×23=4321× (20+3)

<u>Step 2: Multiply the 4-digit number by each part</u>

1. Multiply by 20:

    4321×20=4321×2×10

    4321×2=8642

    8642×10=86420

2. Multiply by 3:          4321×3=12963

<u>Step 3: Add the results</u>    86420+12963=99383

✅ So, **4321 × 23 = 99383**

**Q1:** Multiply the following using the **column method.**

a) 1234 × 12

b) 4721 × 13

Q2: Multiply the following using the **breaking down method**.

a) 1345 × 11

b)3289 × 12