What Is 21 Multiplied By 80

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Understanding basic multiplication is fundamental to mastering mathematics, and one common question that arises is: What is 21 multiplied by 80? Whether you're a student, a professional, or simply someone curious about numbers, knowing how to compute and interpret such multiplication problems is essential. In this comprehensive guide, we'll explore the calculation of 21 multiplied by 80, its significance, and various contexts in which this multiplication might be relevant. Let's delve into the details and uncover everything you need to know about this simple yet important arithmetic operation.

Understanding the Basics of Multiplication

Before we focus on the specific problem of multiplying 21 by 80, it's important to review the fundamentals of multiplication.

What Is Multiplication?

Multiplication is a mathematical operation that combines two numbers to get a product. It can be thought of as repeated addition. For example, multiplying 3 by 4 (written as 3 × 4) is the same as adding 3 four times: 3 + 3 + 3 + 3 = 12.

Key Terms in Multiplication

- **Multiplicand:** The number being multiplied (in this case, 21)
- **Multiplier:** The number by which the multiplicand is multiplied (in this case, 80)
- **Product:** The result of multiplication (what we are calculating)

Calculating 21 Multiplied by 80

Let's look at how to compute the product of 21 and 80 efficiently.

Method 1: Standard Multiplication

Using the traditional long multiplication method:

1. Write the numbers vertically:

   21

   × 80

2. Multiply 21 by 0 (units digit of 80):

   21 × 0 = 0

3. Multiply 21 by 8 (tens digit of 80), remembering to shift one position to the left:

   21 × 8 = 168

   Since this is in the tens place, it becomes 1680.

4. Sum the partial products:

   0 + 1680 = 1680

5. Result:

   21 × 80 = 1680

Answer: 21 multiplied by 80 equals 1680.

Alternative Methods to Calculate 21 × 80

In addition to the standard long multiplication, there are other methods to compute this product, especially useful for mental math.

Method 2: Break Down the Numbers

Using the distributive property, break down 80 into 80 = 8 × 10:

1. Calculate 21 × 8:

   21 × 8 = 168

2. Then multiply the result by 10:

   168 × 10 = 1680

Result: 1680.

This method simplifies mental calculations by breaking larger numbers into manageable parts.

Method 3: Using Multiplication Tables

Most students memorize basic multiplication tables up to 12, but for larger numbers, you can use known facts:

- 21 × 10 = 210
- 21 × 70 = (21 × 7) × 10 = 147 × 10 = 1470
- 21 × 80 = 21 × (70 + 10) = 1470 + 210 = 1680

The Significance of 21 × 80 in Real-World Contexts

Multiplication problems like 21 × 80 aren't just exercises in arithmetic—they often appear in practical scenarios.

Financial Calculations

- Shopping and Budgeting: Calculating total cost when buying multiple items.
- Example: If each item costs $21, and you buy 80 items, the total cost is 21 × 80 = $1680.
- Salary and Wages: Determining earnings based on hourly rates and hours worked.
- Example: If someone earns $21 per hour and works 80 hours, their total earning is $1680.

Business and Commerce

- Inventory Management: Estimating total units or revenue.
- Pricing Strategies: Understanding total sales based on unit price and quantity.

Educational and Academic Purposes

- Practicing multiplication skills.
- Solving word problems involving quantities and cost calculations.

Factors and Properties Related to 21 × 80

Understanding the factors and properties associated with the numbers involved can deepen your mathematical insights.

Prime Factorization of 21 and 80

- 21 = 3 × 7
- 80 = 2^4 × 5

This indicates that 21 and 80 are coprime (they share no common prime factors), which can be useful in complex mathematical contexts like simplifying fractions or solving equations.

Multiplication Properties

- Commutative Property: 21 × 80 = 80 × 21 = 1680
- Associative Property: If multiplying multiple numbers, the grouping doesn't affect the product.

Related Multiplication Problems and Variations

Exploring similar problems can reinforce your understanding.

Examples:

1. What is 21 multiplied by 81?

   Solution: 21 × 81 = (21 × 80) + (21 × 1) = 1680 + 21 = 1701

2. What is 20 multiplied by 80?

   Solution: 20 × 80 = 1600

3. What is 22 multiplied by 80?

   Solution: (21 + 1) × 80 = 1680 + 80 = 1760

These variations help build mental math skills and understanding of multiplication patterns.

Common Mistakes to Avoid

When performing multiplication, especially with larger numbers, be mindful of:

1. Misalignment of digits during manual calculations.
2. Forgetting to shift the product when multiplying by tens or hundreds.
3. Incorrect addition of partial products.
4. Confusing the order of multiplication (though it's commutative, always double-check your work).

Using calculators or digital tools can help verify manual calculations, but practicing mental math enhances overall numerical literacy.

Conclusion

To summarize, What is 21 multiplied by 80? The answer is 1680. This calculation can be performed using various methods, including traditional long multiplication, breaking down the numbers for easier mental computation, or leveraging known multiplication facts. Recognizing the practical applications of this multiplication—such as budgeting, shopping, or work-related calculations—illustrates its importance beyond mere numbers.

Mastering such basic yet versatile multiplication problems enhances your overall mathematical proficiency, making it easier to handle more complex calculations and real-world problems. Whether in academics, finance, or everyday life, understanding how to compute 21 × 80 accurately and efficiently is a valuable skill. Keep practicing similar problems to strengthen your mental math skills and build confidence in handling larger and more complicated calculations.

Remember: The key to mastering multiplication is understanding the concepts, practicing regularly, and applying these skills in practical contexts.

Frequently Asked Questions

What is 21 multiplied by 80?

21 multiplied by 80 equals 1,680.

How do I calculate 21 times 80?

To calculate 21 times 80, multiply 21 by 80, which results in 1,680.

Is 21 multiplied by 80 a common multiplication problem?

Yes, multiplying 21 by 80 is a straightforward multiplication problem often used in basic arithmetic exercises.

What is the product of 21 and 80?

The product of 21 and 80 is 1,680.

Can you break down how to multiply 21 by 80 step-by-step?

Sure! Multiply 21 by 80: 21 × 80 = (20 + 1) × 80 = (20 × 80) + (1 × 80) = 1,600 + 80 = 1,680.

What are some real-world applications of multiplying 21 by 80?

Multiplying 21 by 80 can be useful in scenarios like calculating total items when you have 21 groups of 80 items each.

Is 21 times 80 considered a large number?

It depends on context, but 1,680 is generally considered a moderate number in everyday calculations.

What is the significance of multiplying 21 by 80 in mathematics?

It demonstrates basic multiplication skills and helps in understanding larger multiplication problems through the distributive property.

Are there any interesting facts about the number 1,680 resulting from 21 times 80?

Yes, 1,680 is a highly composite number and has interesting mathematical properties, such as being divisible by many numbers.

Additional Resources

What Is 21 Multiplied By 80 is a straightforward arithmetic question that often comes up in basic math exercises, everyday calculations, or quick mental math challenges. At its core, this question involves multiplying two numbers—21 and 80—to find their product. While the operation might seem simple, understanding the process, implications, and applications can deepen one’s appreciation for multiplication and its role in various contexts. In this article, we will explore the concept of multiplying 21 by 80 in detail, breaking down the calculation, examining different methods, and discussing practical uses and implications of such a multiplication.

Understanding the Basics of Multiplication

What Is Multiplication?

Multiplication is one of the four fundamental operations in mathematics, alongside addition, subtraction, and division. It can be viewed as repeated addition. For example, multiplying 3 by 4 (written as 3 × 4) is equivalent to adding 3 four times: 3 + 3 + 3 + 3 = 12.

In the case of 21 multiplied by 80, it means adding 21 to itself 80 times or, more efficiently, applying the multiplication process directly to find the product.

The Significance of Multiplying Numbers like 21 and 80

Numbers like 21 and 80 appear frequently in real-world contexts:
- Financial calculations (e.g., total cost of multiple items)
- Measurement conversions
- Data analysis
- Engineering and construction projects

Understanding how to multiply such numbers accurately is essential in both academic and practical scenarios.

Calculating 21 Multiplied By 80

Method 1: Standard Multiplication Algorithm

The traditional method involves the long multiplication process:

1. Write the numbers vertically:

```
21
× 80
----
```

2. Multiply 21 by 0 (the units digit of 80):

21 × 0 = 0

3. Multiply 21 by 8 (the tens digit, but remember to shift one position to the left because it’s in the tens place):

21 × 8 = 168

Since this is in the tens place, add a zero at the end: 1680

4. Add the partial products:

```
0
+1680
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1680
```

Result: 21 × 80 = 1680

Method 2: Using Distributive Property

The distributive property simplifies multiplication by breaking numbers into parts:

21 × 80 = (20 + 1) × 80 = (20 × 80) + (1 × 80)

Calculate each term:
- 20 × 80 = 1600
- 1 × 80 = 80

Add the results:
- 1600 + 80 = 1680

Result: 21 × 80 = 1680

This method is especially useful for mental math and understanding the relationships between numbers.

Alternative Methods and Tips for Quick Calculation

Using Estimation

Estimation helps verify if the answer makes sense. For instance:
- 20 × 80 = 1600 (close to our actual result)
- Since 21 is slightly more than 20, the actual product (1680) makes sense because it's slightly larger than 1600.

Breaking Down Numbers for Mental Math

Breaking numbers into easier parts can speed up calculations:
- Recognize that 21 is close to 20 and 80 is close to 80.
- Multiply 20 × 80 = 1600
- Add 1 × 80 = 80
- Sum = 1680

Using a Calculator

For accuracy and speed, especially with larger or more complex numbers, a calculator is reliable. Simply input 21 × 80 to get the same result: 1680.

Understanding the Result: What Does 1680 Represent?

Practical Applications of 1680

The product 1680 can relate to various real-world situations:
- Financial context: If each item costs $21, purchasing 80 items totals $1680.
- Time calculations: 1680 minutes equal 28 hours, which could be relevant in scheduling or time management.
- Measurement and construction: For example, if a piece of material is 21 units wide and you have 80 such pieces, the total length is 1680 units.

Implications in Different Fields

- Economics: Calculating total expenditure or revenue.
- Engineering: Determining total materials needed.
- Education: As an example problem for students to practice multiplication skills.

Pros and Cons of Various Calculation Methods

Standard Long Multiplication
- Pros: Accurate, systematic, applicable to large numbers
- Cons: Time-consuming for mental math, can be error-prone if not careful

Distributive Property
- Pros: Simplifies mental calculations, enhances understanding of number relationships
- Cons: Might require more steps for very large numbers

Estimation
- Pros: Quick check for reasonableness
- Cons: Less precise, not suitable for final answers requiring exactness

Calculator Use
- Pros: Fast, accurate
- Cons: Less develops mental calculation skills, not always allowed in exams

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Extensions and Related Topics

Multiplying Other Numbers Similar to 21 and 80

Understanding the pattern:
- 21 × 80 = 1680
- 22 × 80 = 1760
- 23 × 80 = 1840

This pattern shows that increasing the first number by 1 adds 80 to the total, demonstrating the linear relationship.

Multiplication in Larger Contexts

- Scaling up calculations: multiplying larger numbers by 80 follows similar procedures.
- Using multiplication tables and patterns to speed up calculations.

Mathematical Properties Involved

- Commutative property: 21 × 80 = 80 × 21
- Associative property: applicable when combining multiple factors
- Distributive property: as shown earlier, breaking down numbers simplifies calculations

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Conclusion

What Is 21 Multiplied By 80 is a fundamental question that exemplifies basic multiplication concepts with wide-ranging practical relevance. The product, 1680, can be obtained through various methods—standard long multiplication, the distributive property, or mental estimation—each serving different contexts and preferences. Understanding how to perform this calculation efficiently encourages better numerical literacy and prepares learners for more complex mathematical challenges. The straightforward nature of this multiplication also highlights the importance of mastering basic arithmetic operations, which are essential tools in everyday life, professional tasks, and advanced mathematics.

Whether used for quick mental math, precise calculations, or conceptual understanding, multiplying 21 by 80 demonstrates the power and simplicity of multiplication, a cornerstone of mathematical literacy.

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