Long Multiplication

Introduction

Long multiplication is a way of finding the answer to a multiplication problem when the numbers we're multiplying are a bit bigger. It's like normal multiplication, but we write down our working out step by step, making it easier to keep track of everything.

Steps to Follow

1. **Line Up the Numbers:** First, we need to make sure the digits of the numbers we're multiplying are lined up correctly. The ones digit of the number we're multiplying (called the "multiplicand") should be on the right, and the ones digit of the number we're multiplying by (called the "multiplier") should be on the bottom. Example: 45
   x 6
2. **Multiply the Digits:** Starting from the right, we multiply each digit of the multiplicand by each digit of the multiplier, just like in normal multiplication. We start with the ones digit of the multiplier. Example:```
   45
   x 6

270

```

3. **Carry Over:** Example:```
   45
   x 6
   a. If the multiplication of a digit results in a number with more than one digit, we write down only the ones digit and carry the other digits (if any) over to the next column.
   b. We write down the carried-over digits above the next column, ready to add them later.

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270

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```

4. **Add Up the Partial Products:** Now, we add up the partial products to find the final answer. We start at the right, adding the numbers in each column and carrying over any digits when necessary. Example:```
   45
   x 6

270

```

So, when we multiply 45 by 6, the answer is 270.

## Visual Aid

You can use a grid method to help visualize long multiplication. Draw a grid with rows and columns to represent each digit of the multiplicand and multiplier. Then, fill in the partial products and add them up.

| 4 | 5 ----------  x | 6 ----------

## Practical Activity

You can practice long multiplication by using small objects, like blocks or pebbles. Create two rows using the objects to represent the multiplicand and multiplier. Then, count the total number of objects in the last row to find the answer.

For example, if you have 4 objects in the first row and 5 in the second row, and you want to multiply by 6, you would create 6 rows with the same number of objects in each row. Count all the objects in the last row to find the answer.

## Conclusion

Long multiplication is a method used to solve multiplication problems with larger numbers. By following the steps and using visual aids, you can make complex multiplication easier to understand and solve. Keep practicing, and you'll become a long multiplication expert in no time!
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