Mastering Multiplication and Division by 8

This presentation explores the foundational math skills of multiplying and dividing by eight. Understanding these operations unlocks efficiency in numerical calculations and reveals the inherent power of eight, often seen as two cubed (2^3), reflecting its significance in binary systems and beyond.

by Tony BM

The Significance of Eight

Digital Data

One byte, the fundamental unit of digital information, consists of 8 bits. This relationship is crucial in computer science.

Measurement

In the US standard fluid system, one cup contains exactly 8 fluid ounces, a common conversion in cooking.

Music

An octave in music spans 8 notes in a diatonic scale, creating a complete and harmonious progression.

Time & Health

Many health recommendations suggest 8 hours of sleep for adults, highlighting its role in daily well-being.

Multiplication by 8: The Concept

Definition: Multiplication by 8 represents combining 8 equal groups of a given number.

Example: To calculate 5 x 8, you are essentially adding 8 five times: 8 + 8 + 8 + 8 + 8 = 40. This means "5 groups of 8."

This concept is also key for understanding digital data scaling, such as converting bits to bytes efficiently.

Strategy 1: Double, Double, Double

Concept

Multiply by 8 by successively doubling the number three times. This leverages the fact that 8 = 2 x 2 x 2.

(x * 8) = (x * 2 * 2 * 2)

Step 1: First Double

Start with the original number and double it once.

Example: Calculate 7 x 8 Double 7: **14**

Step 2: Second Double

Take the result from the first doubling and double it again.

Double 14: **28**

Step 3: Third Double

Finally, double the result from the second step to get your answer.

Double 28: 56

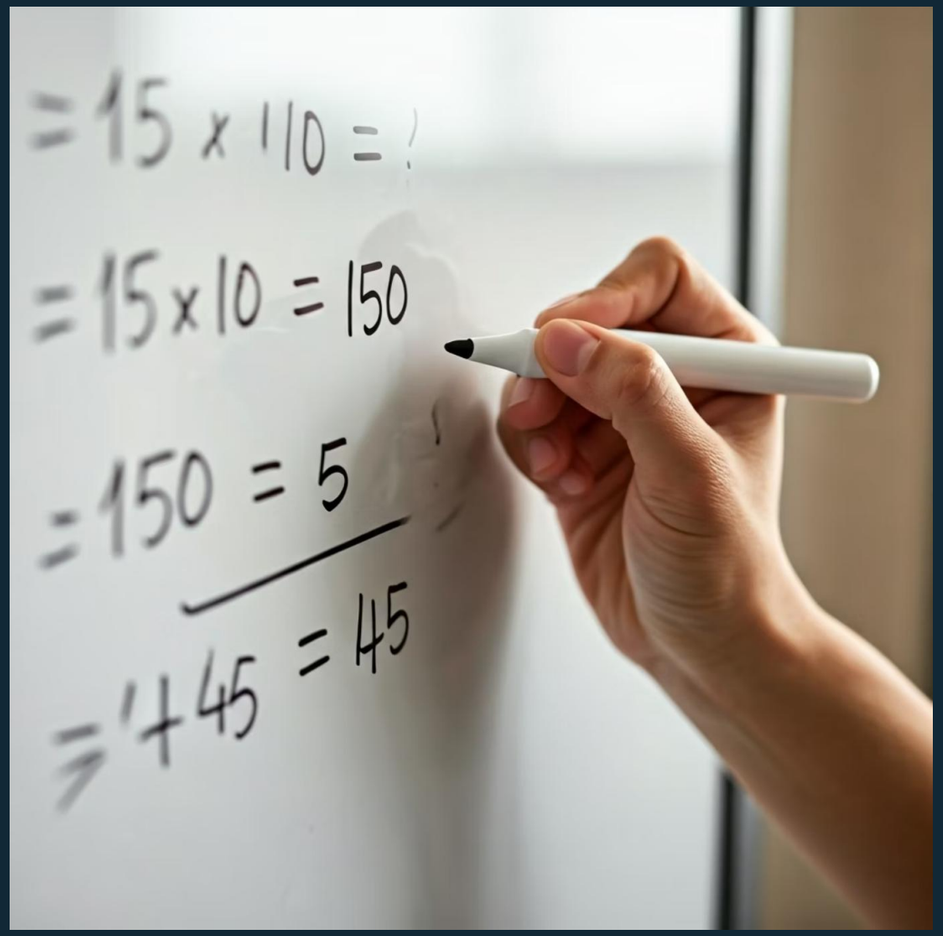
Strategy 2: Multiply by 10, Subtract Twice

This method simplifies multiplication by 8 by using a familiar base-10 calculation.

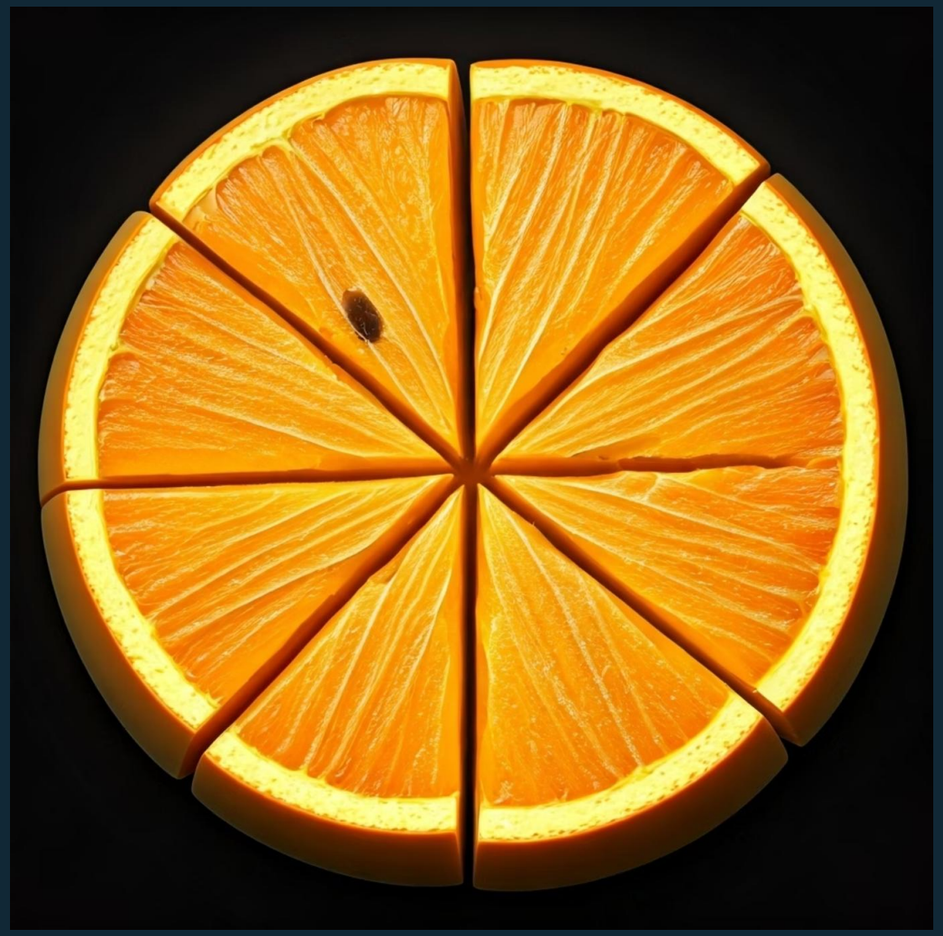
Formula: (x * 8) = (x * 10) - (x * 2)

Example: Calculate 9 x 8

- Multiply 9 by 10: **9 x 10 = 90**
- Multiply 9 by 2: **9 x 2 = 18**
- Subtract the second result from the first: **90 - 18 = 72**



Division by 8: The Concept



Definition: Division by 8 involves splitting a total number or quantity into 8 perfectly equal parts or groups.

Example: If you have 64 items and divide them by 8, you are creating 8 groups, each containing 8 items (64 ÷ 8 = 8).

Division by 8 is the inverse operation of multiplication by 8. It's important to remember that only numbers perfectly divisible by 8 will result in an integer quotient without a remainder.

Strategy: Halve, Halve, Halve

Concept

To divide by 8, you can successively halve the number three times. This method directly reverses the "double, double, double" strategy for multiplication.

(x / 8) = (x / 2 / 2 / 2)

Step 1: First Halving

Start with your number and divide it by 2.

Example: Calculate 72 ÷ 8 Half of 72: **36**

Step 2: Second Halving

Take the result from the first halving and divide it by 2 again.

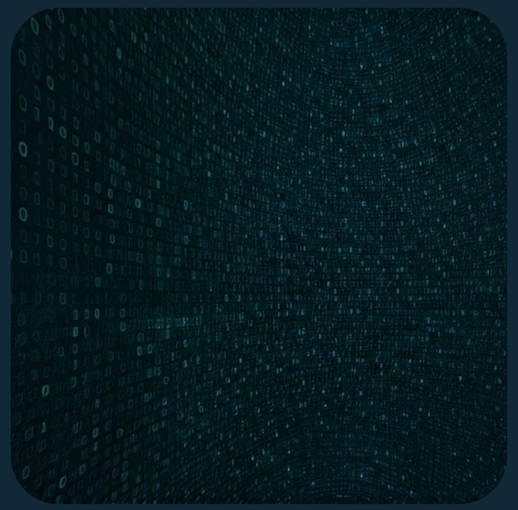
Half of 36: **18**

Step 3: Third Halving

Finally, halve the result from the second step to arrive at your final answer.

Half of 18: 9

Real-World Applications



Computer Science

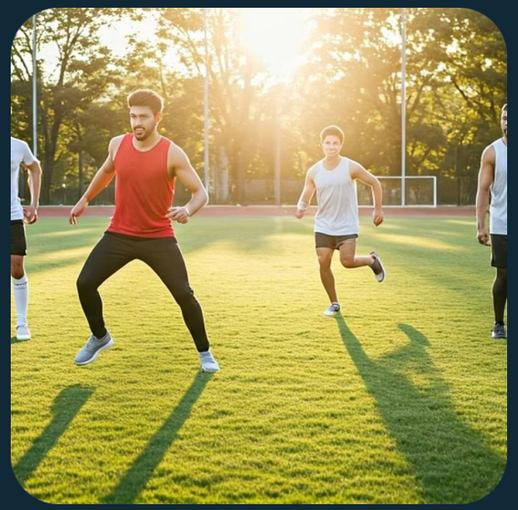
Converting bits to bytes is a fundamental operation (e.g., 24 bits ÷ 8 = 3 bytes).

Recipes & Cooking

Scaling recipes for 8 servings often requires multiplying or dividing ingredients by 8.

Construction

Standard lumber dimensions, like 8-foot lengths, make multiplication and division by 8 common.



Team Sports

Many sports leagues feature 8-player teams, influencing game strategy and player rotation.

Key Takeaways

Mastery of multiplication and division by 8 significantly boosts mental math capabilities and numerical fluency. The "double, double, double" and "halve, halve, halve" strategies are powerful simplification techniques.

A deep understanding of the number 8 is critical across diverse contexts, from digital technology and everyday measurements to cooking and construction. Consistent practice with these operations solidifies essential mathematical skills for both academic and real-world success.

Make sure to like and subscribe for more videos :)

Social media:

Youtube | Facebook | Google Classroom [New!] (Class code: pou4ig4b)