

Prime Numbers and How to Find Them

KS3 Ages 11-14 ⌚ 3 min read

What is a Prime Number?

A **prime number** is a whole number greater than **1** that can only be divided evenly by **1** and itself. That means if you try to divide it by any other number, you'll always get leftovers (a remainder). For example, **7** is prime because the only way to divide it evenly is 1×7 or 7×1 . You can't split **7** into equal groups of **2**, **3**, **4**, **5**, or **6** without having something left over.

Think of it like a pizza: if you have **7 slices** and want to give equal slices to groups of friends, you can only do it perfectly if you have **1** group of **7** or **7** groups of **1** slice. Any other number of groups leaves slices left over!

Prime Numbers vs. Composite Numbers

Not all numbers are prime. Numbers that can be divided by more than just **1** and themselves are called **composite numbers**. For instance, **12** is composite because you can divide it by **2**, **3**, **4**, and **6** as well as **1** and **12**. The first few prime numbers are **2**, **3**, **5**, **7**, **11**, **13**, **17**, **19**, and **23**. Notice that **2** is the only even prime number—every other even number can be divided by **2**.

How to Find Prime Numbers

One simple way to check if a number is prime is to try dividing it by every number smaller than it (except **1**). If none of those numbers divide evenly into it, it's prime! Mathematicians use a clever trick called the **Sieve of Eratosthenes**, an ancient method that filters out composite numbers to reveal primes.

Think of it like sorting sweets: you start with all the sweets mixed together, then remove groups that follow certain patterns (like every second sweet, then every third, and so on), leaving only the special ones behind.

Here's how it works: write down all numbers from **2** upwards. Circle **2** (it's prime), then cross out all multiples of **2**. Move to **3**, circle it, then cross out all its multiples. Keep going until you've processed all the numbers up to your target. The circled numbers are all prime!

Why Prime Numbers Matter

Prime numbers are incredibly important in mathematics and real life. They're used in **computer security** to protect your passwords and online information. Banks use huge prime numbers to keep your money safe. Scientists also study primes because they're the basic building blocks of all whole numbers—every number can be made by multiplying primes together, like LEGO bricks creating bigger structures.