The Compound Interest Guide

> Compound interest is growth earning its own growth. This guide shows exactly how it works, with a worked example you can reproduce in the calculator.

Compound interest is the reason a modest amount left alone for decades can outgrow a much larger amount saved late. The mechanism is simple once you see it, and it is worth seeing clearly, because almost every long-term money decision leans on it.

What compound interest actually is

Simple interest pays you only on the money you put in. Compound interest pays you on the money you put in plus all the interest you have already earned. Each period your balance is a little larger, so the next round of growth is calculated on a bigger number. Growth starts earning its own growth.

That feedback loop is slow at first and then surprisingly steep. Early on the balance barely pulls away from a straight line. Give it enough years and the curve bends upward hard, because the interest-on-interest term grows faster than the part you contributed.

The formula, in plain English

For a lump sum, the future value is the starting amount times one plus the periodic rate, raised to the number of periods. On this site the period is one month, so the monthly rate is the annual rate divided by twelve, and the number of periods is the years times twelve.

Written out, future value equals principal times (1 plus monthly rate) to the power of months. When you also add money each month, every contribution starts its own compounding clock from the day it lands, and the calculator sums all of those growing streams for you.

A worked example you can reproduce

Start with 10,000 dollars, add 200 dollars a month, assume a 7 percent annual return, and let it run 20 years. The balance grows to about 144,573 dollars. Of that, 68,000 dollars is money you put in (the 10,000 start plus 58,000 in contributions) and about 86,573 dollars is growth.

Notice that more than half of the ending balance is growth rather than deposits. That is the whole point of compounding. To see it yourself, open the Compound Interest Calculator, enter those same four numbers, and watch the principal, contributions, and growth stack up.

The mistakes that quietly cost you

The most expensive mistake is waiting. Because the last years of compounding do the heaviest lifting, a late start cannot be fixed by simply saving more, and starting early is worth more than picking a slightly higher return.

The second is confusing the rate you are quoted with the rate you earn. Fees, taxes, and inflation all shave the real return, so a headline 7 percent is not 7 percent in your pocket. The third is treating a single steady rate as a promise. It is an average to plan around, not a forecast for any one year.

Where this model stops

This guide and the calculator assume a smooth, constant return. Markets do not move that way. The order of good and bad years changes where you land, especially once you start withdrawing. For a sense of that range rather than a single line, the Compound Interest Calculator has a Monte Carlo panel that runs hundreds of random return paths.

Compound interest is a tool, not a strategy on its own. What you invest in, how much it costs, and how long you leave it alone matter more than any single input here.

Key takeaway. Time is the input you cannot buy back. Because compounding accelerates, the dollars you invest earliest end up doing the most work.

Assumptions

- Interest compounds monthly, and any contribution is added at the end of each month. This is the platform default.
- The return rate is a steady annual figure you choose. Real markets vary from year to year.

Sources

- U.S. SEC, Office of Investor Education, compound interest basics
- U.S. SEC Investor.gov, saving and investing for the long term