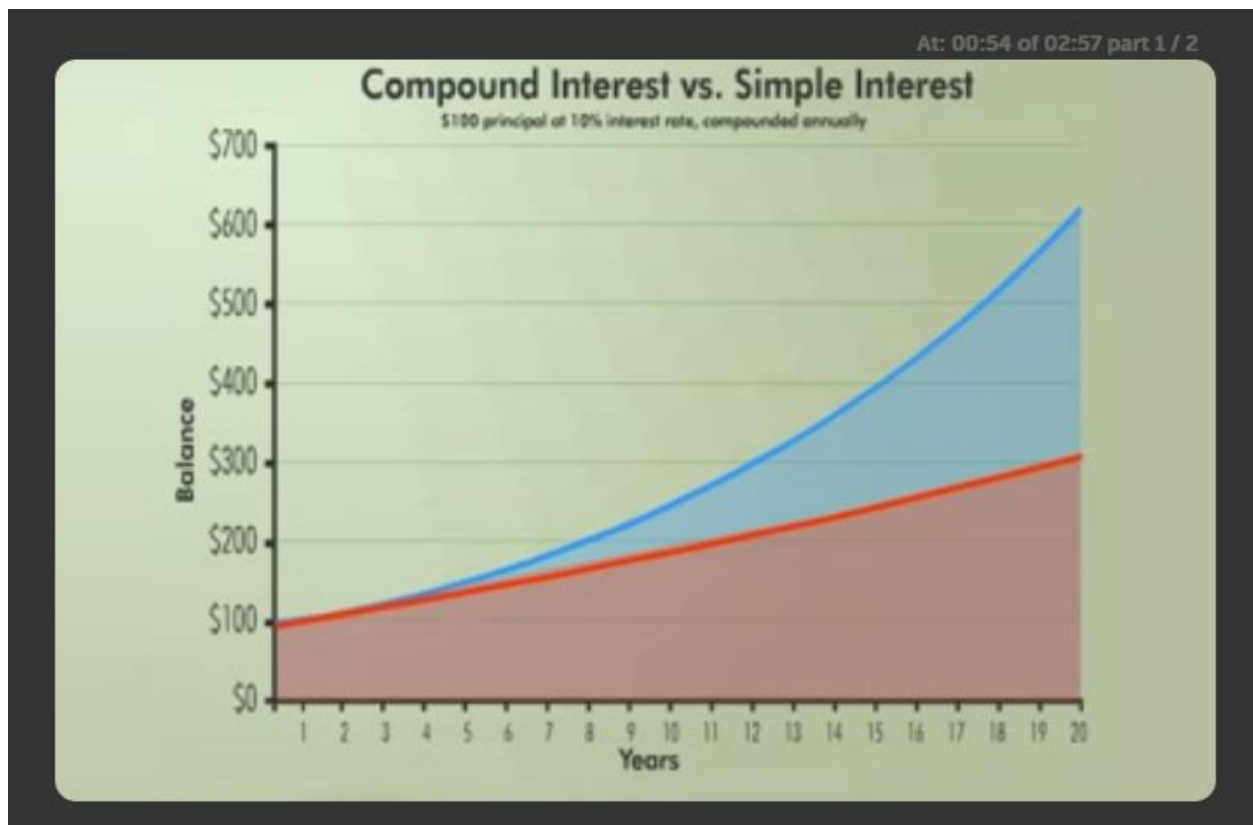# Compound Interest

Compound interest is interest paid not only on cash that is invested, the principal, but also on the interest that has been earned in prior periods. Imagine that two years ago you invested $100, earning an annual rate of return of 10%. You made $10 in interest the first year. In the second year, you earned interest on the $100 plus the $10 you earned in interest. You earned $11 in interest the second year. If you keep your money in this investment, you will continue to earn interest on the original investment, plus the interest earned in earlier periods.



This graph illustrates the impact of compound interest. The red line represents your account balance if you earned interest only on your principal, simple interest. And the blue line represents your account balance earning compound interest. Over time, the difference is substantial.

A major lesson of compound interest is to begin investing early in life to give your investments as much time as possible to grow. Compound interest does its best work when it is given time to accumulate. Let's use the example of 30 year old Joe, who starts an investment account to help pay for retirement, which he plans on taking at age 65. We'll say that Joe saved $250 each

month and earns 8% interest annually. In the previous example, the interest was compounded annually. Joe's retirement savings, on the other hand, are compounded monthly. That means that each month, Joe will earn interest on his interest from the previous month.

This graph illustrates the effects of compound interest on Joe's retirement account. Notice how over time, while Joe's principal balance grows at a steady pace, $250 each month, his interest balance grows at an increasing rate due to compounding. Nearly $575,000 for retirement. Not bad, but what if Joe had started saving just 6 years earlier at age 24?

In 6 additional years, Joe contributes only another $18,000 in principal, but the effects of compound interest add nearly $355,000. A second lesson of compound interest is that changes in interest rates have greater effects over time. What if Joe earned a higher interest rate?
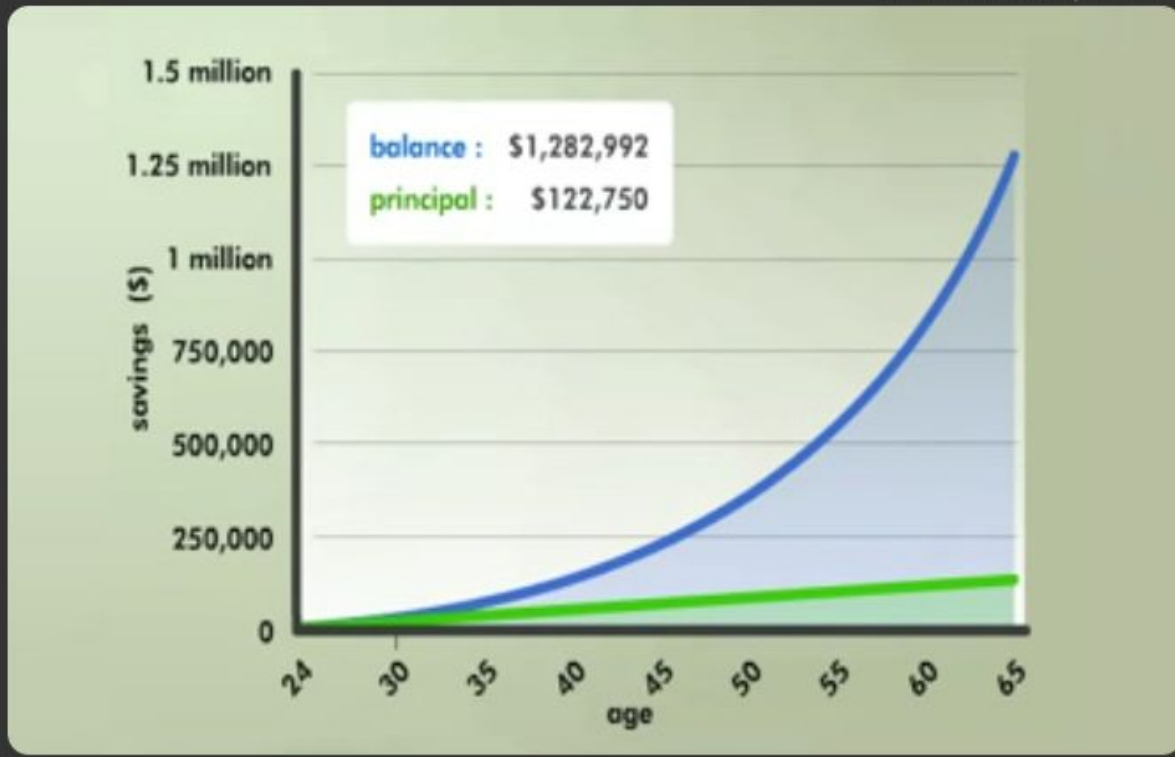
Because of 41 years of compounding, a mere 3% increase in Joe's interest rate yields a 153% increase in his savings.