COMPOUND INTEREST AND SAVING PART 2 OF 8 · AGES 13+

How to Calculate Compound Interest

Three worked examples: year by year, with a multiplier, and with the formula for monthly compounding. Every rate here is an example.

1 Year by year

1,000 is saved at an example rate of 5% a year, added once a year. How much is there after 3 years?

1. Year 1: 5% of 1,000 = 50, so 1,000 + 50 = 1,050
2. Year 2: 5% of 1,050 = 52.50, so 1,050 + 52.50 = 1,102.50
3. Year 3: 5% of 1,102.50 = 55.125, so 1,102.50 + 55.125 = 1,157.625
4. Round money to 2 decimal places at the end: 1,157.63
5. Interest earned = 1,157.63 − 1,000 = 157.63

ANSWER **1,157.63 after 3 years, of which 157.63 is interest**

2 Use a multiplier

2,500 is saved at an example rate of 4% a year, added once a year, for 10 years. Find the final amount.

1. A 4% increase means multiplying by 1 + 0.04 = 1.04
2. Ten years means multiplying by 1.04 ten times: 1.04^10
3. 1.04^10 = 1.480244… (keep every digit)
4. A = 2,500 × 1.480244… = 3,700.61
5. Check the method: 1,000 × 1.05^3 = 1,157.63, the same as Example 1

ANSWER **3,700.61 after 10 years**

3 Monthly: A = P(1 + r/n)^(nt)

1,000 is saved at an example rate of 6% a year, with interest added monthly, for 3 years. Find the final amount A.

1. P = 1,000, r = 6% = 0.06, n = 12 times a year, t = 3 years
2. Rate for each month: r/n = 0.06 ÷ 12 = 0.005
3. Number of months: nt = 12 × 3 = 36
4. A = 1,000 × 1.005^36 = 1,000 × 1.196680… = 1,196.68
5. Added once a year instead: 1,000 × 1.06^3 = 1,191.02, so monthly gives 5.66 more

ANSWER **1,196.68 after 3 years**

Round only at the end

Keep every digit on your calculator until the final step, then round money to 2 decimal places. To find just the interest, subtract the starting amount: interest = A − P.

NEXT IN THE SERIES

3. Simple vs Compound Interest: What Is the Difference?

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