Compounding More Often

Interest added n times a year. Rate per period: r over n. Number of periods: n times t. A = P(1 + r/n)^(nt). Divide, add 1, power, times P.

1 THE VOCABULARY
Words we use

Compounding period how often interest is added.

n periods in a year: annually 1, quarterly 4, monthly 12, daily 365.

Rate per period rn: the piece of the yearly rate paid each time.

Number of periods n times t: the exponent.

Growth factor for one period 1 + rn, read as one quantity.

- Watch out for these.
- Using the whole yearly rate every period. Divide by n first.
- Using t as the exponent. The exponent is n times t.
- Rounding the factor in the middle. Round only at the end.
- Expecting daily to earn far more. It earns only a little more.

2 THE METHOD
The order

1. DIVIDE r by n: the rate per period.
2. ADD 1 the growth factor for one period.
3. POWER raise to n times t. Keys: factor, power key, nt, equals.
4. TIMES P multiply by the principal.
5. ROUND to the cent, only now.

WHY MORE OFTEN EARNS A LITTLE MORE

Interest added sooner starts earning interest sooner. But the yearly rate is the same, split into smaller pieces, so the gain is small.

3 $1,000 AT 6% FOR 1 YEAR
Compounded monthly

0.0612 = 0.005	rate per period
1 + 0.005 = 1.005	growth factor each month
12 × 1 = 12 periods	the exponent
$1.005^{12} = 1.0616778$	power first
1000 × 1.0616778 = $1,061.68	times P, round at the end

THE COMPARISON

Annually $1,060.00. Quarterly $1,061.36. Monthly $1,061.68. Daily about $1,061.83.

SAY IT OUT LOUD

Divide the rate, add 1, raise to the number of periods, times P. More often earns a little more, but only a little.