Compounding More Often

A = P(1 + r/n)^(nt). Rate per period: r over n. Number of periods: n times t.
Order: divide, add 1, power, times P. Round only at the end.

Name _____ Date _____

Words we use

say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Compounding period	How often interest is added to the account.	Find n, the number of periods in a year.
Compounded quarterly, monthly, daily	4, 12, or 365 times a year.	n = 4, 12, 365. Annually is n = 1.
Rate per period	r over n, written stacked: the piece of the yearly rate paid each time.	Divide the yearly rate by n first.
Number of periods	n times t: how many times interest is added in all.	It is the exponent.
Growth factor for one period	1 plus r over n: what the balance is multiplied by each period.	Read the whole parentheses as one quantity.

Part A How often?

COMPOUNDED	ANNUALLY	QUARTERLY	MONTHLY	DAILY
n				

Part B Rate per period and number of periods

YEARLY RATE	COMPOUNDED	YEARS	RATE PER PERIOD (STACKED, THEN DECIMAL)	NUMBER OF PERIODS
6%	monthly	5		
4%	quarterly	3		
3%	monthly	2		
8%	quarterly	2		

Part C One example, four ways

$1,000 at 6% for 1 year.

COMPOUNDED	RATE PER PERIOD	ADD 1	PERIODS	POWER	BALANCE
annually					
quarterly					
monthly					

1. How much more does monthly earn than annually? Is that a lot?

Part D Find the balance

1. $2,000 at 4% compounded quarterly for 3 years.

2. $500 at 3% compounded monthly for 2 years.

Part E Read the pieces

1. In 2000(1 + 0.04 over 4) to the 4 · 3, name the principal, the yearly rate, how often it is compounded, and the number of years.

2. What do the parentheses mean as one quantity? The exponent?

3. Why does compounding more often earn a little more?

Part F Exit ticket

1. 4.8% compounded monthly for 3 years: rate per period and number of periods.

2. $800 at 5% compounded quarterly for 1 year, to the cent.

Answer key

Part A. 1, 4, 12, 365.

Part B. 0.06 over 12 = 0.005; 60. 0.04 over 4 = 0.01; 12. 0.03 over 12 = 0.0025; 24. 0.08 over 4 = 0.02; 8.

Part C. Annually: 0.06, 1.06, 1, 1.06, $1,060.00. Quarterly: 0.015, 1.015, 4, 1.0613636, $1,061.36. Monthly: 0.005, 1.005, 12, 1.0616778, $1,061.68. 1. $1.68 more: only a little.

Part D. 1. $2000(1.01)^{12} = \$2{,}253.65$. 2. $500(1.0025)^{24} = \$530.88$.

Part E. 1. $2,000; 4%; quarterly; 3 years. 2. The growth factor for one period; how many periods have passed. 3. Interest is added sooner, so it starts earning interest sooner.

Part F. 1. 0.048 over 12 = 0.004; 36 periods. 2. $800(1.0125)^{4} = \$840.76$.