

NOW YOU TRY STUDENT WORK SHEET
11th - 12th Grade

ANNUAL INTEREST

1. Taylor wants to invest her **\$7,500** college fund at her bank. She picks an **annual certificate of deposit (CD)** that will pay her **3%** annually. She has a three year timeframe until she will need her college money. (Remember, **3% interest** is .03 when written as a decimal.)

A. Fill in the table to find out how Taylor's investment grows:

	Beginning Balance	3% Interest	Ending Balance
Year 1	\$7,500	\$225	\$7,725
Year 2	\$7,725	\$231.75	\$7,956.75
Year 3	\$7,956.75	\$238.70	\$8,195.45

- B. If Taylor chose a **statement savings account, compounding quarterly**, how would her account **balance** increase in the first year?

	Beginning Balance	3% Interest	Ending Balance
1 st Quarter	\$7,500	\$56.25	\$7,556.25
2 nd Quarter	\$7,556.25	\$56.67	\$7,612.92
3 rd Quarter	\$7,612.92	\$57.10	\$7,670.02
4 th Quarter	\$7,670.02	\$57.53	\$7,727.55

- C. Compare the **APYs** Taylor's accounts would earn depending on which account type she chose:

Annual CD APY: 3%

Statement Savings APY: 3.034%

ANNUAL vs. QUARTERLYCompound Interest Formula

There is a formula you can use to calculate the ending balance of an investment if you know certain facts about the investment, such as: **principal, APR, compounding periods, and the number of years the investment lasts**

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Where: A = Accumulated Balance

P = Principal

r = APR expressed as a decimal

n = number of compounding periods/year

t = number of years the investment lasts

Let's look again at Taylor's situation:

Taylor wants to invest her **\$7,500** college fund at her bank. She has a three-year timeframe until she will need her college money. **Annual compounding CDs and quarterly compounding statement savings accounts** are **BOTH** offering an **APR** of **3%**. (Remember, **3% interest** is .03 when written as a decimal.)

2. Complete Taylor's information below.

Principal = \$7,500

APR = 3%

Number of years the investment lasts = 3

Use the **compound interest formula** to compute her balance at the end of the investment. Do the calculation for the annual **CD** and the quarterly statement savings account.

Annual CD

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = \$7,500\left(1 + \frac{.03}{1}\right)^{1 \times 3}$$

$$A = \$7,500 \times 1.03^3 = \$7,500 \times 1.092727$$

$$A = \$8,195.45$$

Quarterly Statement Savings

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = \$7,500\left(1 + \frac{.03}{4}\right)^{4 \times 3}$$

$$A = \$7,500 \times 1.0075^{12} = \$7,500 \times 1.093806$$

$$A = \$8,203.55$$

ANNUAL vs. QUARTERLY vs. MONTHLY

3. Andrea wants to invest **\$2,500** at her bank. **Annual certificates of deposit, statement savings accounts, and money market savings accounts** are all offering a **3% APR**. Andrea will not need the funds in this investment for 5 years. (Remember, **3% interest** is .03 when written as a decimal.)

Use the **compound interest formula** to calculate the ending balance of each investment:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

CD	Statement Savings	Money Market
$A = \$2,500\left(1 + \frac{.03}{1}\right)^{1 \times 5}$	$A = \$2,500\left(1 + \frac{.03}{4}\right)^{4 \times 5}$	$A = \$2,500\left(1 + \frac{.03}{12}\right)^{12 \times 5}$
$A = \$2,500 \times 1.03^5$	$A = \$2,500 \times 1.0075^{20}$	$A = \$2,500 \times 1.0025^{60}$
$A = \$2,500 \times 1.159274$	$A = \$2,500 \times 1.161184$	$A = \$2,500 \times 1.161616$
$A = \$2,898.19$	$A = \$2,902.96$	$A = \$2,904.04$

4. In the space below, explain what investment advice you'd give Andrea and why.

Andrea should put her money away into the money market savings account, which compounds monthly, because this will yield the greatest return.