Compounding Exponential Functions

Dwayne deposited $6,000 into an account with 6.1% interest.

1) Write a model that represents this

$$y = 6000(1+.061)^x$$

2) Most banks calculate interest at certain points of the year like monthly or quarterly. How could you alter the formula to account for this?

DIVIDE THE INTEREST INTO EQUAL PARTS

The idea of compounding takes the exponential formula we already know and adds an **compounding variable (n)** seen in the equation below. Good news! This formula is on the formula sheet for the EOC!

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

There are many possible compounding periods. Here are some common ones

Annual	Semi-Annual	Quarterly	Monthly	Weekly	Daily
1	2	4	12	52	365

3) Determine how much Dwayne will have saved over 8 years compounded annually.

$A = 6000\left(1+\frac{.061}{1}\right)^{(1\cdot 8)}$ = $9635.50

4) Determine how much Dwayne will have saved over 8 years compounded quarterly.

$A = 6000\left(1+\frac{.061}{4}\right)^{(4\cdot 8)}$ = $9738.39

5) Determine how much Dwayne will have saved over 8 years compounded monthly.

$A = 6000\left(1+\frac{.061}{12}\right)^{(12\cdot 8)}$ = $9762.25

6) Determine how much Dwayne will have saved over 8 years compounded daily.

$A = 6000\left(1+\frac{.061}{365}\right)^{(365\cdot 8)}$ = $9773.93

7) Which compounding period gives him the best amount? By how much?

THE DAILY ACCOUNT

9773.93 - 9635.50 By $138.43

8) What can you hypothesize about how the overall amount is changed by increasing the compounding periods in a year? THE GREATER THE COMPOUNDING PERIOD THE GREATER THE TOTAL AMOUNT