Math Instructional Framework

Full Name	
Time Frame	6 weeks Unit 3
Unit Name	Logarithmic Functions as Inverses Of Exponential Functions
Learning Task/Topics/ Themes	Half-time, double time, and real phenomena
Standards **and** Elements	**MM3A2. Students will explore logarithmic functions as inverses of exponential functions.** g. Explore real phenomena related to exponential and logarithmic functions including half-time and doubling time
Lesson Essential Questions	How to solve real phenomena includ8ing half-time and doubling time?
Activator	If you drink a can of Red Bull before school, at what time of the day will half the caffeine be out of your system? Problem 2 Task 2
Vocabulary	**Compounded continuously:** Interest that is, theoretically, computed and added to the balance of an account each instant. The formula is $A = Pe^{rt}$, where A is the ending amount, P is the principal or initial amount, r is the annual interest rate, and t is the time in years. **Compounded interest:** A method of computing the interest, after a specified time, and adding the interest to the balance of the account. Interest can be computed as little as once a year to as many times as one would like. The formula is $A = P_0(1 + r/n)^{nt}$, where A is the ending amount, P_o is the initial amount, r is the annual interest rate, n is the number of times compounded per year, and t is the number of years. **Exponential functions:** A function of the form $y = a \cdot b^x$ where $a > 0$ and either $0 < b < 1$ or $b > 1$.
Work Session	Graphic Organizer with butterfly Matching cards with half-life, and double time Math 3 Test Prep Page 11 (McDougal Littell) Exponential Growth and Decay organizer http://regentsprep.org/Regents/math/ALGEBRA/AE7/ExpDecayL.htm

Summarizing/Closing/Formative Assessment	Problem 2 Task 2 (Energy drink problem)