Core Content

Cluster Title: Construct and compare linear, quadratic, and exponential models and solve problems.
Standard F.LE.4: For exponential models, express as a logarithm the solution to a $b^{ct} = d$ where *a, c, and d* are numbers and the base b is 2, 10 or *e*; evaluate the logarithm using technology.
Concepts and Skills to Master
• Understand the relationship between the properties of exponents and the properties of logarithms. • Convert exponential equations to logarithmic equations. • Convert logarithmic equations to exponential equations. • Use technology to evaluate logarithms.

Supports for Teachers

Critical Background Knowledge	
• Use the properties of exponents to transform expressions for exponential functions (I.A.SSE.3c)	
Academic Vocabulary	
logarithm	
Suggested Instructional Strategies	**Resources**
• Review rules of exponents and relate to rules of logarithms.	• NCTM Illuminations: "Logarithms Demystified"
Sample Formative Assessment Tasks	
Skill-Based Task: Convert $\log_2 \frac{1}{16} = -4$ to exponential form. Expand using logarithmic properties $\ln \frac{3x^2}{y+1}$	**Problem Task:** Given the values of the powers of 2 (i.e. 2^0=1, 2^1=2, 2^2=4, 2^3=8,…) estimate the value $\log_2 73$ without the use of technology. Using technology, find the value $\log_2 -4$. Using properties of exponents, explain the result.