

Construct and compare linear, quadratic, and exponential models and solve problems (F.LE.3-4)	
Standard III.F.LE.3: Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> Observe that a quantity increasing exponentially eventually exceeds a quantity increasing as a polynomial function. 	
Related Standards: Current Course	Related Standards: Future Courses
III.A.REI.11 , III.F.IF.4 , III.F.IF.6 , III.F.IF.7 , III.F.IF.9 , III.F.BF.3 , III.F.LE.3 , III.F.LE.5	P.F.IF.7

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically (II.F.LE.3) Distinguish between linear and exponential functions (I.F.LE.1 and I.F.LE.2) Compare properties of two functions using multiple representations (II.F.IF.9)
Academic Vocabulary
<i>polynomial function</i>
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5630#71642

Construct and compare linear, quadratic, and exponential models and solve problems (F.LE.3-4)	
<p>Standard III.F.LE.4: For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where $a, c,$ and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology. Include the relationship between properties of logarithms and properties of exponents, such as the connection between the properties of exponents and the basic logarithm property that $\log xy = \log x + \log y$.</p>	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Relate the properties of exponents to the properties of logarithms (product, quotient, and power properties). • Convert between exponential equations and logarithmic equations. • Use technology to evaluate logarithms. 	
Related Standards: Current Course	Related Standards: Future Courses
III.A.SSE.1 , III.A.SSE.2 , III.F.BF.4 , III.F.IF.8	P.F.BF.4, P.F.BF.5

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Use the properties of exponents (8.EE.1) to transform expressions for exponential functions (II.A.SSE.3c)
Academic Vocabulary
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71642

Interpret expressions for functions in terms of the situation it models. Introduce $f(x)=e^x$ as a model for continuous growth (F.LE.5)	
Standard III.F.LE.5: Interpret the parameters in a linear, quadratic, and exponential functions in terms of a context.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Interpret the parameters in a function in terms of a context. Parameters include a, b, h, and k in the function: $a[f(bx)-h]+k$. • Identify b as a parameter of an exponential function in the form $f(x) = b^x$, including cases when b equals e. • Relate continuous growth models to $f(x) = e^x$ (for example continuous compound interest) 	
Related Standards: Current Course	Related Standards: Future Courses
III.F.IF.4 , III.F.IF.6 , III.F.IF.9 , III.F.BF.3 , III.F.LE.3 , III.F.LE.4	

Support for Teachers

Critical Background Knowledge (Access Background Knowledge)
<ul style="list-style-type: none"> • Identify the effect on the graph by replacing $f(x)$ with $f(x) + k$, $kf(x)$, $f(kx)$, or $f(x+k)$ (II.F.BF.3) • Interpret the parameters in a linear or exponential function in terms of a context (I.F.LE.5) • Interpret how different values of b in $f(x) = b^x$ effect the growth of an exponential function (II.F.IF.8)
Academic Vocabulary
Parameters, base, continuous growth
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71642