

Build a linear or exponential function that models a relationship between two quantities (F.BF.1-2)	
<p>Standard I.F.BF.1: Write a function that describes a relationship between two quantities.¹²</p> <ul style="list-style-type: none"> a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. <i>Forexample, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</i> 	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Recognize patterns in a table, geometric model, or other representation to determine an explicit expression and a recursive process. • Combine constant, linear, and/or exponential functions using addition or subtraction. 	
Related Standards: Current Course	Related Standards: Future Courses
All function standards, I.A.CED.2 , I.A.SSE.1 , I.G.CO.2 , I.G.CO.4 , I.G.CO.6	II.F.BF.1 , II.F.BF.3 , III.F.BF.1 , III.F.BF.3 , III.F.BF.4

Support for Teachers

Critical Background Knowledge (Access Background Knowledge)
<ul style="list-style-type: none"> • Generate and analyze patterns and relationships (4.OA.5, 5.OA.3) • Simplifying expressions (7.EE.2) • Apply integer exponent properties (8.EE.1) • Definition of function (8.F.3) • Construct linear functions (8.F.4) • Describe relationships between quantities (8.F.5)
Academic Vocabulary
Function, intercepts, explicit expression, recursive
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5600#70258

Build a linear or exponential function that models a relationship between two quantities (F.BF.1-2)	
Standard I.F.BF.2: Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. Limit to linear and exponential functions. Connect arithmetic sequences to linear functions and geometric sequences to exponential functions. □	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Write recursive and explicit formulas to represent arithmetic sequences. • Write recursive and explicit formulas to represent geometric sequences. • Connect arithmetic sequences to linear functions and geometric sequences to exponential functions. • Translate between recursive and explicit formulas for sequences. • Model contextual situations with arithmetic or geometric sequences. 	
Related Standards: Current Course	Related Standards: Future Courses
All function standards, I.A.CED.2	II.F.BF.1 , III.A.SSE.4

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Generate and analyze patterns and relationships (4.OA.5, 5.OA.3) • Simplifying expressions (7.EE.2) • Apply integer exponent properties (8.EE.1) • Definition of function (8.F.3) • Construct linear functions (8.F.4) • Describe relationships between quantities (8.F.5)
Academic Vocabulary
Arithmetic sequence, geometric sequence, recursive, explicit
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5600#70258

Build new functions from existing functions (F.BF.3)	
Standard I.F.BF.3: Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, for specific values of k (both positive and negative); find the value of k given the graphs. Relate the vertical translation of a linear function to its y -intercept. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> Describe verbally and graphically what will happen to linear and exponential functions when $f(x)$ is replaced by $f(x) + k$, where k is any real number. Given a graph of $f(x)$ and $f(x) + k$ on the same coordinate axis, find the value of k. Relate the vertical translation of a linear function to its y-intercept. 	
Related Standards: Current Course	Related Standards: Future Courses
I.A.SSE.1 , I.F.IF.2 , I.F.IF.4 , I.F.IF.7 , I.F.IF.9 , I.F.LE.2 , I.F.LE.5 , I.G.CO.2 , I.G.CO.4 , I.G.CO.6	II.A.SSE.1 , II.F.BF.3 , II.F.IF.7 , II.F.IF.8 , III.A.SSE.1 , III.F.BF.3 , III.F.IF.7 , III.F.IF.8

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> Graphing linear (8.F.3) and exponential functions (I.F.IF.7) Definition of function (8.F.3) Construct linear functions (8.F.4)
Academic Vocabulary
Transformation, Translation, vertical shift
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5600#70258