

Construct and compare linear and exponential models and solve problems (F.LE.1-3)	
<p><b>Standard I.F.LE.1:</b> Distinguish between situations that can be modeled with linear functions and with exponential functions.</p> <ul style="list-style-type: none"> <li>a. Prove that linear functions grow by equal differences over equal intervals; exponential functions grow by equal factors over equal intervals.</li> <li>b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</li> <li>c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</li> </ul>	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>• Justify the fact that linear functions grow by equal difference over equal intervals using tables and graphs.</li> <li>• Justify the fact that exponential functions grow or decay by equal factors over equal intervals using tables and graphs.</li> <li>• Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</li> <li>• Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">I.A.SSE.1</a> , <a href="#">I.F.LE.2</a> , <a href="#">I.F.LE.3</a> , <a href="#">I.F.LE.5</a> , <a href="#">I.F.IF.3</a> , <a href="#">I.F.IF.6</a> , <a href="#">I.F.BF.1</a> , <a href="#">I.F.BF.2</a>	<a href="#">II.A.SSE.1</a> , II.F.IF.3, <a href="#">II.F.IF.4</a> , <a href="#">II.F.IF.6</a> , <a href="#">II.F.IF.9</a> , <a href="#">II.F.BF.1</a> , <a href="#">II.F.LE.3</a> , <a href="#">III.F.LE.3</a> , <a href="#">III.F.LE.4</a> , <a href="#">III.F.LE.5</a> , <a href="#">III.A.SSE.1</a> , III.F.IF.3, <a href="#">III.F.IF.4</a> , <a href="#">III.F.IF.6</a> , <a href="#">III.F.IF.9</a> , <a href="#">III.F.BF.1</a> , P.F.BF.1

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>• Use proportional relationships to solve percent problems (<a href="#">7.RP.3</a>)</li> <li>• Describe where a function is increasing or decreasing (<a href="#">8.F.5</a>)</li> <li>• Identify the constant rate of change (<a href="#">7.RP.2b</a>, <a href="#">8.EE.5</a>, <a href="#">8.F.4</a>, <a href="#">8.F.5</a>)</li> <li>• Find a percent of a quantity as a rate per 100 (<a href="#">6.RP.3c</a>)</li> </ul>
Academic Vocabulary
interval, rate, factors, constant rate of change, percent rate per unit, growth, decay
Resources
<a href="http://www.uen.org/core/core.do?courseNum=5600#70276">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5600#70276">http://www.uen.org/core/core.do?courseNum=5600#70276</a>

Construct and compare linear and exponential models and solve problems (F.LE.1-3)	
<b>Standard I.F.LE.2:</b> Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>• Construct a linear function and/or an arithmetic sequence given a situation, a set of ordered pairs, or a table.</li> <li>• Construct an exponential function and/or a geometric sequence given a situation, ordered pairs, or a table.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">I.A.SSE.1</a> , <a href="#">I.F.LE.1</a> , <a href="#">I.F.LE.3</a> , <a href="#">I.F.LE.5</a> , <a href="#">I.F.IF.2</a> , <a href="#">I.F.IF.3</a> , <a href="#">I.F.IF.6</a> , <a href="#">I.F.BF.1</a> , <a href="#">I.F.BF.2</a>	<a href="#">II.A.SSE.1</a> , II.F.IF.3, <a href="#">II.F.IF.4</a> , <a href="#">II.F.IF.6</a> , <a href="#">II.F.IF.9</a> , <a href="#">II.F.BF.1</a> , <a href="#">II.F.LE.3</a> , <a href="#">III.F.LE.3</a> , <a href="#">III.F.LE.4</a> , <a href="#">III.F.LE.5</a> , <a href="#">III.A.SSE.1</a> , III.F.IF.3, <a href="#">III.F.IF.4</a> , <a href="#">III.F.IF.6</a> , <a href="#">III.F.IF.9</a> , <a href="#">III.F.BF.1</a> , P.BF.1

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>• Construct a function to model linear situation (<a href="#">8.F.4</a>)</li> <li>• Use function notation (<a href="#">I.F.IF.2</a>)</li> </ul>
Academic Vocabulary
Exponential, linear, arithmetic, geometric, sequences
Resources
<a href="http://www.uen.org/core/core.do?courseNum=5600#70276">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5600#70276">http://www.uen.org/core/core.do?courseNum=5600#70276</a>

Construct and compare linear and exponential models and solve problems (F.LE.1-3)	
<b>Standard I.F.LE.3:</b> Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>Observe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly using graphs and tables.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">I.A.REI.6</a> , <a href="#">I.F.IF.6</a> , <a href="#">I.F.IF.7</a> , <a href="#">I.F.IF.9</a> , <a href="#">I.F.LE.1</a> , <a href="#">I.F.LE.2</a> , <a href="#">I.F.LE.5</a>	<a href="#">II.A.REI.7</a> , <a href="#">II.F.IF.4</a> , <a href="#">II.F.IF.6</a> , <a href="#">II.F.IF.7</a> , <a href="#">II.F.IF.9</a> , <a href="#">II.F.LE.3</a> , <a href="#">II.F.IF.6</a> , <a href="#">III.F.LE.3</a> , <a href="#">P.F.IF.7</a>

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> <li>Perform operations using whole number exponents (<a href="#">6.EE.2c</a>)</li> <li>Identify, compare, and interpret rates of change (<a href="#">7.RP.2b</a>, <a href="#">8.F.2</a>, <a href="#">8.EE.5</a>)</li> <li>Identify linear and nonlinear functions from a graph or a table (<a href="#">8.F.4</a>, <a href="#">8.F.5</a>)</li> </ul>
Academic Vocabulary
Linear, exponential, increasing
Resources
<a href="http://www.uen.org/core/core.do?courseNum=5600#70276">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5600#70276">http://www.uen.org/core/core.do?courseNum=5600#70276</a>

Interpret expressions for functions in terms of the situation they model. (F.LE.5)	
<b>Standard I.F.LE.5:</b> Interpret the parameters in a linear or exponential function in terms of a context. Limit exponential functions to those of the form $f(x)=b^x +k$ .	
Concepts and Skills to Master	
<ul style="list-style-type: none"> <li>Interpret the parameters in a linear function in terms of a context. Parameters include slope and y- intercept</li> <li>Interpret the parameters in an exponential function in terms of a context. Parameters include the base value and vertical shifts.</li> </ul>	
Related Standards: Current Course	Related Standards: Future Courses
<a href="#">I.F.IF.3</a> , <a href="#">I.F.IF.4</a> , <a href="#">I.F.IF.7</a> , <a href="#">I.F.IF.9</a> , <a href="#">I.F.BF.1b</a> , <a href="#">I.F.BF.2</a> , <a href="#">I.F.BF.3</a> , <a href="#">I.F.LE.1</a> , <a href="#">I.F.LE.2</a> , <a href="#">I.F.LE.3</a>	<a href="#">II.F.IF.4</a> , <a href="#">II.F.IF.6</a> , <a href="#">II.F.IF.7</a> , <a href="#">II.F.BF.1b</a> , <a href="#">II.F.BF.3</a> , <a href="#">II.F.LE.3</a> , <a href="#">III.F.IF.4</a> , <a href="#">III.F.IF.6</a> , <a href="#">III.F.IF.7</a> , <a href="#">III.F.BF.1b</a> , <a href="#">III.F.BF.3</a> , <a href="#">III.F.LE.5</a>

Support for Teachers

Critical Background Knowledge (Access Background Knowledge)
<ul style="list-style-type: none"> <li>Compare proportional relationships <math>y=mx</math> to other linear relationships <math>y = mx+b</math> (<a href="#">7.RP.2</a>, <a href="#">8.F.3</a>, <a href="#">8.EE.5</a>)</li> <li>Compare properties of two functions (<a href="#">8.F.2</a>), interpret the equation <math>y = mx+b</math> (<a href="#">8.F.3</a>), and interpret the rate of change and initial value (<a href="#">8.F.4</a>)</li> </ul>
Academic Vocabulary
parameters, base value, initial value, vertical shift
Resources
<a href="http://www.uen.org/core/core.do?courseNum=5600#70276">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5600#70276">http://www.uen.org/core/core.do?courseNum=5600#70276</a>