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| Define, evaluate, and compare functions (8.F.1-3)  |  |
| <b>Standard 8.F.1:</b> Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in grade 8.)            |  |
| Concepts and Skills to Master (This is the students first exposure to function in the Utah Core)   |  |
| <ul style="list-style-type: none"> <li>Understand that functions describe relationships where for each input there is exactly one output.</li> <li>Recognize a graph of a function as the set of ordered pairs consisting of an input and its corresponding output.</li> </ul> |  |
| Related Standards: Current Course  | Related Standards: Future Courses  |
| <a href="#">8.F.2</a> , <a href="#">8.F.3</a> , <a href="#">8.F.5</a>  | <a href="#">F.IF.1</a> , <a href="#">F.IF.2</a> , <a href="#">F.IF.3</a> , Functions: All interpreting functions (IF), building functions (BF), linear and exponential functions (LE), and Trigonometry (TF) |

Support for Teachers

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| Critical Background Knowledge  |
| <ul style="list-style-type: none"> <li>Graph ordered pairs on the coordinate plane (<a href="#">6.EE.9</a>)</li> <li>Evaluate expressions for a given value (<a href="#">6.EE.2c</a>)</li> <li>Represent proportional relationships using multiple representations, such as tables, graphs, equations, and context (<a href="#">7.RP.2</a>)</li> </ul> |
| Academic Vocabulary  |
| function, input, output, dependent, independent  |
| Resources  |
| <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">http://www.uen.org/core/core.do?courseNum=5180#71433</a>  |

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| Define, evaluate, and compare functions (8.F.1-3)  |  |
| <b>Standard 8.F.2:</b> Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>Forexample, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.</i> |  |
| Concepts and Skills to Master  |  |
| <ul style="list-style-type: none"> <li>Identify properties of functions from any given representation (algebraically, graphically, numerically in tables, or by verbal descriptions).</li> <li>Compare two linear functions each represented a different way and describe similarities and differences.</li> </ul>   |  |
| Related Standards: Current Course  | Related Standards: Future Courses  |
| <a href="#">8.EE.5</a> , <a href="#">8.EE.6</a> , <a href="#">8.F.4</a> , <a href="#">8.SP.1</a>   | <a href="#">F.IF.9</a> , <a href="#">F.IF.4</a> , <a href="#">F.IF.7</a> |

Support for Teachers

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| Critical Background Knowledge   |
| <ul style="list-style-type: none"> <li>Identify unit rate in tables, graphs, equations, diagrams, and verbal descriptions (<a href="#">7.RP.2b</a>)</li> <li>Understand the definition of function (<a href="#">8.F.1</a>)</li> </ul> |
| Academic Vocabulary   |
| slope, intercept, rate of change, function, linear, non-linear  |
| Resources   |
| <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">http://www.uen.org/core/core.do?courseNum=5180#71433</a>                     |

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| Define, evaluate, and compare functions (8.F.1-3)  |   |
| <p><b>Standard 8.F.3:</b> Interpret the equation <math>y = mx + b</math> as defining a linear function whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function <math>A = s^2</math>, giving the area of a square as a function of its side length, is not because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.</i></p>   |   |
| Concepts and Skills to Master  |   |
| <ul style="list-style-type: none"> <li>• Distinguish between linear and non-linear functions given their algebraic expression, a table, a verbal description, or a graph.</li> <li>• Recognize functions written in the form <math>y = mx + b</math> are linear and that every linear function can be written in the form <math>y = mx + b</math>.</li> <li>• Understand the slope of a linear function as a constant rate of change, whose graph is a straight line.</li> </ul> |   |
| Related Standards: Current Course  | Related Standards: Future Courses   |
| <a href="#">8.EE.5</a> , <a href="#">8.EE.6</a> , <a href="#">8.F.1</a> , <a href="#">8.F.4</a> , <a href="#">8.SP.2</a> , <a href="#">8.SP.3</a>  | <a href="#">F.IF.7</a> , <a href="#">F.BF.3</a> , <a href="#">F.LE.1</a> , <a href="#">F.LE.2</a> , <a href="#">F.LE.3</a> , and <a href="#">F.LE.5</a> |

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| Critical Background Knowledge  |
| <ul style="list-style-type: none"> <li>• Connect proportional relationships to linear functions and recognize the unit rate as the slope (<a href="#">7.RP.2</a>, <a href="#">8.EE.5</a>, and <a href="#">8.EE.6</a>)</li> <li>• Generate and plot ordered pairs from an equation (<a href="#">6.EE.2c</a> and <a href="#">8.F.1</a>)</li> </ul> |
| Academic Vocabulary  |
| collinear, linear, nonlinear, slope  |
| Resources  |
| <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">http://www.uen.org/core/core.do?courseNum=5180#71433</a>  |

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| Use functions to model relationships between quantities (8.F.4-5)  |  |
| <b>Standard 8.F.4:</b> Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two $(x, y)$ values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. |  |
| Concepts and Skills to Master  |  |
| <ul style="list-style-type: none"> <li>Determine and interpret the initial value and rate of change given two points, a graph, a table of values, a geometric representation (visual model), or a verbal description of a linear relationship.</li> <li>Write the equation of a line given two points, a graph, a table of values, a geometric representation (visual model), or a verbal description of a linear relationship.</li> </ul>         |  |
| Related Standards: Current Course  | Related Standards: Future Courses  |
| <a href="#">8.SP.2</a> , <a href="#">8.SP.3</a> , <a href="#">8.F.2</a> , <a href="#">8.F.5</a> , <a href="#">8.EE.5</a> , <a href="#">8.EE.6</a>  | <a href="#">F.IF.4</a> , <a href="#">F.IF.7</a> , <a href="#">F.BF.1</a> , <a href="#">F.BF.2</a> , <a href="#">F.BF.3</a> , <a href="#">F.LE.1</a> , <a href="#">F.LE.2</a> , <a href="#">F.LE.3</a> , <a href="#">F.LE.5</a> , <a href="#">A.CED.2</a> |

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| Critical Background Knowledge  |
| <ul style="list-style-type: none"> <li>Understand linear functions and their characteristics (<a href="#">8.F.3</a>)</li> <li>Represent proportional relationships using equations, given various representations (<a href="#">7.RP.2c</a>)</li> </ul> |
| Academic Vocabulary  |
| linear relationship, $y$ -intercept, slope   |
| Resources  |
| <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">http://www.uen.org/core/core.do?courseNum=5180#71433</a>                                      |

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| Use functions to model relationships between quantities (8.F.4-5)  |  |
| <b>Standard 8.F.5:</b> Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. |  |
| Concepts and Skills to Master  |  |
| <ul style="list-style-type: none"> <li>Describe attributes of a function by analyzing a graph.</li> <li>Create a graphical representation given the description of the relationship between two quantities.</li> </ul>   |  |
| Related Standards: Current Course  | Related Standards: Future Courses  |
| <a href="#">8.F.4</a> , <a href="#">8.SP.1</a> , <a href="#">8.SP.2</a> , <a href="#">8.SP.3</a>   | <a href="#">F.IF.4</a> , <a href="#">F.IF.5</a> , <a href="#">F.IF.6</a> |

## Support for Teachers

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| Critical Background Knowledge   |
| <ul style="list-style-type: none"> <li>Plot points on the coordinate plane (<a href="#">6.EE.2</a>)</li> <li>Interpret graphical relationships (<a href="#">7.RP.2</a>)</li> </ul>                                |
| Academic Vocabulary   |
| Increasing and decreasing rates of change, zero rate of change (constant function), undefined slope, linear, nonlinear, initial value.  |
| Resources   |
| <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">Curriculum Resources</a> : <a href="http://www.uen.org/core/core.do?courseNum=5180#71433">http://www.uen.org/core/core.do?courseNum=5180#71433</a> |