**Any standard highlighted in yellow has been determined by our WCSD teachers, district and state experts as essential for students to master.**

**Strand 11.F.IF: I can interpret functions that arise in applications in terms of a context (Standards F.IF.4-6). I can analyze functions using different representations (Standards F.IF.7-9).**

**Standard 11.F.IF.4: I can interpret key features of graphs and tables in terms of the quantities for a function that models a relationship between the two quantities.**

| Learning Targets | Academic Vocabulary & Notation | Question Stems | Possible Assessments |
|---|---|---|---|
| • I can interpret key features of graphs and tables in terms of the quantities for a function.<br>• I can model the relationship between the two quantities.<br>• I can sketch graphs showing key features given a verbal description of the relationship. | • intercepts, intervals, function, increasing, decreasing, positive, negative, relative maximums, minimums, symmetries, end behavior, periodicity, graphs, quantities, relationship | • Identify and label the key features (see the academic vocabulary).<br>• How are these the same? Different? | • District CFAs |

**Standard 11.F.IF.5: I can relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.**

| Learning Targets | Academic Vocabulary & Notation | Question stems | Possible Assessments |
|---|---|---|---|
| • I can describe the functions if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, the positive integers would be an appropriate domain for the function. | • domain, function, graph, quantitative relationship positive integers, appropriate domain | • What would you do if_____?<br>• How did you show it? | • District CFAs |

**Standard 11.F.IF.6: I can calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. I can estimate the rate of change from a graph.**

| Learning Targets | Academic Vocabulary & Notation | Question stems | Possible Assessments |
|---|---|---|---|
| • I can calculate and interpret the average rate of change of a function over a specified interval.<br>• I can estimate the rate of change from a graph. | • calculate, interpret, average rate of change, function, symbolically, table, specified interval, estimate, graph | • How have you shown your thinking?<br>• The math words that help someone understand what I did are_____. | • District CFAs |

**Standard 11.F.IF.7: I can graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.**

| Learning Targets | Academic Vocabulary & Notation | Question stems | Possible Assessments |
|---|---|---|---|
| • I can graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>• I can compare and contrast square root, cubed root, and step functions with all other functions.<br>• I can graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>• I can graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>• I can graph exponential and logarithmic functions, showing intercepts and end behavior; and trigonometric functions, showing period, midline, and amplitude. | • graph, function, symbolically, key features, square root, cube root, piecewise-defined functions, step functions, absolute value functions, compare, contrast, polynomial functions, identifying zeros, factorizations, end behavior, trigonometric functions, showing period, midline, amplitude | • Given a sheet of paper that measures 45.7 cm by 30.5 cm, cut a square measuring x by x from each of the corners to produce a topless box.<br>• Model the volume of the box with a polynomial equation. What's the practical domain of your volume function?<br>• Explain why a value of x-25 cm is not a possible solution, even though it provides a positive volume.<br>• Identify the value of x that will provide a maximum volume. What is the volume? | • District CFAs |

**Standard 11.F.IF.8: I can write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.**

| Learning Targets | Academic Vocabulary & Notation | Question stems | Possible Assessments |
|---|---|---|---|
| • I can write a function defined by an expression in different forms. | • function, expression, equivalent forms, different properties | • Justify your answer. | • District CFAs |

| **Standard 11.F.IF.9: I can compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).** | | | |
|---|---|---|---|
| **Learning Targets**<br>• Given a graph of one quadratic function and an algebraic expression for another, I can identify which one has the larger maximum. | **Academic Vocabulary & Notation**<br>• properties, functions, algebraical representation, graphical representation, numeric representation, tables, verbal descriptions | **Question stems**<br>• Is there another way you could _____? What is it? | **Possible Assessments**<br>• District CFAs |