



MATH MCS MYP UNIT PLANNER



Teacher(s)	Schumacher	Subject group and discipline	Accelerated Algebra 1/Geometry A		
Unit title	DOE Unit 5 – Comparing and Contrasting Functions	MYP year	4	Unit duration (hrs)	9 Hours (2.5 Weeks)

Inquiry: Establishing the purpose of the unit

Key concept	Related concept(s)	Global context
Relationships	Justification Patterns	Personal and Cultural Expressions Metacognition and abstract thinking
Statement of inquiry		
Justifying through relationships allows understanding and exploration through our own thinking in real life.		
Inquiry questions		
<p>Factual— How do I identify if an equation, table, or graph is a linear, exponential, or quadratic function?</p> <p>Conceptual— How do I determine if a scenario would best be described as a linear, exponential, or quadratic function? How do I compare linear, exponential, and quadratic functions?</p> <p>Debatable— What are the best ways to compare and contrast linear, exponential, and quadratic functions?</p>		
MYP Objectives	Assessments	
MYP Objective C – Communication MYP Objective D - Application	Summative: Unit 5 Test with MYP D portion Formative: MYP C Quiz	

Approaches to learning (ATL)

- Understand and use mathematical notation
- Use and interpret a range of discipline-specific terms and symbols.
- Demonstrate persistence and perseverance
- Make connections between various sources of information
- Gather and organize relevant information to formulate an argument
- Apply existing knowledge to generate new ideas, products or processes
- Combine knowledge, understanding and skills to create products or solutions

Action: Teaching and learning through inquiry

Content Standards

Construct and compare linear, quadratic, and exponential models and solve problems

MGSE9-12.F.LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.

MGSE9-12.F.LE.1a Show that linear functions grow by equal differences over equal intervals

and that exponential functions grow by equal factors over equal intervals. (This can be shown by algebraic proof, with a table showing differences, or by calculating average rates of change over equal intervals).

MGSE9-12.F.LE.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

MGSE9-12.F.LE.1c Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

MGSE9-12.F.LE.2 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).

MGSE9-12.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.

Interpret expressions for functions in terms of the situation they model

MGSE9-12.F.LE.5 Interpret the parameters in a linear ($f(x) = mx + b$) and exponential ($f(x) = a \cdot dx$) function in terms of context. (In the functions above, “m” and “b” are the parameters of the linear function, and “a” and “d” are the parameters of the exponential function.) In context, students should describe what these parameters mean in terms of change and starting value.

Understand the concept of a function and use function notation

MGSE9-12.F.IF.1 Understand that a function from one set (the input, called the domain) to another set (the output, called the range) assigns to each element of the domain exactly one element of the range, i.e. each input value maps to exactly one output value. If f is a function, x is the input (an element of the domain), and $f(x)$ is the output (an element of the range). Graphically, the graph is $y = f(x)$.

MGSE9-12.F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Interpret functions that arise in applications in terms of the context

MGSE9-12.F.IF.4 Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

MGSE9-12.F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

MGSE9-12.F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Analyze functions using different representations

MGSE9-12.F.IF.7 Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.

MGSE9-12.F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one function and an algebraic expression for another, say which has the larger maximum.

Build new functions from existing functions

MGSE9-12.F.BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (Focus on vertical translations of graphs of linear and exponential functions. Relate the vertical translation of a linear function to its y -intercept.)

Learning Activities and Experiences

Topic	Resources	Content Covered	Standards
Compare & Contrast Functions	Day 0 - Review and Refresh Day 0 - Construct and Compare Link to Resources	<ul style="list-style-type: none">Characteristics of Linear, Exponential, and Quadratics Functions	F.LE.1a, F.LE.1b, F.LE.5, F.1F.1, F.IF.2, F.IF.4, F.IF.6, F.IF.7
	8-5 Compare Linear, Exponential, and Quadratic Functions Pearson enVision pg. 344-350	<ul style="list-style-type: none">Identifying Linear, Exponential, and Quadratics FunctionsWriting equations for linear, exponential, and quadratic functionsCompare and Contrast Linear, Exponential, and Quadratic Functions	F.LE.1, F.LE.1a, F.LE.1b, F.LE.1c, F.LE.2, F.LE.3, F.LE.5, F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.9
	Additional Resources: Desmos - iPhone 6s Opening Weekend Sales Desmos - Card Sort - Modeling Desmos - Writing Rules Desmos - Avi and Benita's Repair Shop		

Personalized Learning and Differentiation

Teachers differentiate by providing examples (work samples or task-specific clarifications of assessment criteria); structuring support (advance organizers, flexible grouping, peer relationships); establishing flexible deadlines, and adjusting the pace.

- SWD/504- Accommodations provided
- ELL- Five Principle ELL Curriculum Framework and Vocabulary Supports
- Intervention Support- Re-teaching Activities in Small Groups with Progress Monitoring
- Extensions- Enrichment Tasks and Projects

Resources

Schoology PLC Resources - <https://marietta.schoology.com/group/1985294869/materials#/group/1985294869/materials?f=83226310>