Math Year 4 Algebra 1

4 units as per county directive. Units and content are prescribed by Baltimore County Public Schools

Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	MYP subject specific objective(s)	ATL skills	Content (topics, knowledge, skills)
Family Functions	Relationships	Representations and forms	Identities and relationships	Seemingly different relationships can be represented in a variety of forms that reveal similarities, differences, and connections.	A. i. ii. iii. B. i. ii. C. i. ii. iii. D. ii. iii. iv.	Communication • use and interpret a range of discipline-specific terms and symbols. • give and receive meaningful feedback Thinking • create novel solutions to authentic problems Self-management • use appropriate strategies for organizing complex information	1a Quantities and Models 1. Quantitative Reasoning 2. Algebraic Models 1b Understanding Functions 1. Function Families and Models 2. Patterns and Sequences 1c Linear Functions, Equations and Inequalities 1. Linear Functions 2. Forms of Linear Equations 3. Linear Equations and Inequalities

Exploring Linear Relationships	Systems	Models Systems	Scientific and technical innovation	Analyzing and creating systems and models allows us to understand scientific thought process and strategies in real-life context.	A. i. ii. iii. C. i. ii. iii. iv D. i. ii. iii. iv.	Thinking • use models and simulations to explore complex systems and issues • interpret data • apply existing knowledge to generate new ideas, products, or processes	Topic 2a: Analyzing Data Sets for Two Quantitative Variables ☐ I can represent data on two quantitative variables on a scatter plot and describe how the variables are related (reasoning, HSS.ID.6). ☐ I can fit a function to the data (knowledge, HSS.ID.6a). ☐ I can use functions fitted to data to solve problems in the context of the data (reasoning, HSS.ID.6a). ☐ I can informally assess the fit of a function by plotting and analyzing residuals (reasoning, HSS.ID.6b). ☐ I can fit a linear function for a scatter plot that suggests a linear association (knowledge, HSS.ID.6c). ☐ I can interpret the slope and the intercept of a linear model in the context of the data (reasoning, HSS.ID.7). ☐ I can compute (using technology) the correlation coefficient of a linear fit (knowledge, HSS.ID.8). ☐ I can interpret the correlation coefficient of a linear fit (reasoning, HSS.ID.8). I can distinguish between correlation and causation (reasoning, HSS.ID.9). Topic 2b: Systems of Equations and Inequalities Subtopic: Solving Systems of Linear Equations

							☐ I can prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and multiple of the other produces a system with the same solutions (reasoning, HSA.REI.5). ☐ I can solve systems of linear equations exactly and approximately (knowledge, HSA.REI.6). Subtopic: Modeling with Linear Systems ☐ I can represent constraints by equations or inequalities (knowledge, HSA.CED.3). ☐ I can represent constraints by systems of equations and/or inequalities (knowledge, HSA.CED.3). ☐ I can interpret solutions to equations, inequalities, systems of equations or systems of inequalities as viable or non-viable options in a modeling context (reasoning, HSA.CED.3). ☐ I can graph the solutions to a linear inequality in two variables as a half-plane (knowledge, HSA.REI.12). I can graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes (knowledge, HSA.REI.12). Topic 2c: Piecewise-Defined Functions ☐ I can solve linear equations in one variable, including equations with

							coefficients represented by letters (knowledge, HSA.REI.3). ☐ I can solve linear inequalities in one variable (knowledge, HSA.REI.3). ☐ I can interpret key features of graphs and tables in terms of the quantities that the function it represents (key features include intercepts, intervals where the function is increasing, decreasing, positive or negative, relative maximums and minimums, symmetries, and end behavior) (reasoning, HSF.IF.4). ☐ I can sketch graphs showing key features given a verbal description of the relationship (key features include intercepts, intervals where the function is increasing, decreasing, positive or negative, relative maximums and minimums, symmetries, and end behavior) (reasoning, HSF.IF.4). ☐ I can graph piecewise-defined functions, including step and absolute value functions (knowledge, HSF.IF.7b). ☐ I can identify the effect on the graph by replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (knowledge, HSF.BF.3). I can experiment with transformations and illustrate an explanation of the effects on the graph using technology (reasoning, HSF.BF.3).

Exponential Functions	Relationships	Patterns Justification	Scientific and technical innovation	Patterns can be used to justify relationships to create appropriate models.	A. i. iii. B. ii. iii. C. i. ii. iii. iv. D. i. ii. v.	Communication • share ideas with multiple audiences using a variety of digital environments and media • negotiate ideas with peers and teachers • make inferences and draw conclusions Thinking-critical thinking • evaluate evidence and arguments • consider ideas from multiple perspectives. Transfer skills • make connections between subject groups and disciplines	• 08.F.A: Define, evaluate and compare functions • HSA-CED.A: Create equations that describe numbers or relationships • HSA-REI.B: Solve equations and inequalities in one variable • HSA-REI.D: Represent and solve equations and inequalities graphically • HSA-SSE.A: Interpret the structure of expressions • HSF-IF.A: Understand the concept of a function and use function notation • HSF-IF.B: Interpret functions that arise in applications in terms of the context • 08.F.B: Use functions to model relationships between quantities • HSA-SSE.B: Write expressions in equivalent forms to solve problems • HSF-BF.A: Build a function that models a relationship between two quantities • HSF-IF.C: Analyze functions using different representations • HSF-LE.A: Construct and compare linear, quadratic, and exponential models and solve problems

							• HSF-LE.B: Interpret expressions for functions in terms of the situation they model • HSN-Q.A: Reason quantitatively and use units to solve problems • HSS-ID.B: Summarize, represent, and interpret data on two categorical and quantitative variables
Quadratic and other functions	connections	Equivalence representation	Personal and cultural expression	Creating equivalent representations leads to developing connections between concepts.	A. ii. iii. B. i. ii. iii. C. ii. iii. iv. V. D. i. V.	Research- media literacy • compare, contrast and draw connections among (multi)media resources. Communication • must use and interpret a range of discipline-specific terms and symbols. Thinking- Creative thinking • apply existing knowledge to generate new ideas, products, or processes. • make unexpected or unusual connections	• 08.F.A: Define, evaluate and compare functions • 08.G.B: Understand and apply the Pythagorean Theorem • HSA-APR.A: Perform arithmetic operations on polynomials • HSA-CED.A: Create equations that describe numbers or relationships • HSA-REI.B: Solve equations and inequalities in one variable • HSA-REI.D: Represent and solve equations and inequalities graphically • HSA-SSE.A: Interpret the structure of expressions • HSF-IF.A: Understand the concept of a function and use function notation • HSF-IF.B: Interpret functions that arise in applications in terms of the context

						between objects and/or ideas.	• 08.F.B: Use functions to model relationships between quantities • HSA-SSE.B: Write expressions in equivalent forms to solve problems • HSF-BF.A: Build a function that models a relationship between two quantities • HSF-IF.C: Analyze functions using different representations • HSF-LE.A: Construct and compare linear, quadratic, and exponential models and solve problems • HSF-LE.B: Interpret expressions for functions in terms of the situation they model • HSS-ID.B: Summarize, represent, and interpret data on two categorical and quantitative variables