

MATHEMATICS OVERVIEW- ALGEBRA 1 (Years 3 or 4)

2018-2019

| UNIT TITLE | KEY & RELATED CONCEPTS GLOBAL CONTEXT AND EXPLORATION | STATEMENT OF INQUIRY SUMMATIVE ASSESSMENT TASK | ATL IB MYP MATHEMATICS OBJECTIVES | CONTENT (TOPICS, KNOWLEDGE, SKILLS) |
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| Unit 1 - | <p>Key: Relationships</p> <p>Related: Equivalence, patterns</p> <p>GC: Globalization & sustainability</p> <p>Exploration: -data decision-making</p> | <p>SOI: When using equivalence and patterns, we investigate relationships in order to make data-based decisions.</p> <p>Summative Tasks: Task 1 - Quarter 1 and 2 Assessments: The summative assessment task assesses students understanding of representing patterns, equivalence, and solving problems.</p> <p>Task 2 - Literal Equations Project: Using their name, students will create a personal literal equation and solve for a chosen letter. They will also communicate the correct steps for solving using appropriate mathematical notation and organize the information using a logical structure.</p> <p>Task 3 - CSI stats: The Case of the Missing Cookies: Students will gather data to create a line of best fit in order to solve the mystery. Students will also justify the</p> | <p>ATL: Communication: Communication skills</p> <p>Self Management: Affective skills</p> <p>Thinking: Critical thinking skills</p> <p>Self Management: Reflection skills</p> <p>Thinking: Creative thinking skills</p> <p>IB MYP Math Objectives: Task 1 - Quarter 1 (and 2) Assessments</p> <p>Criterion A: Knowledge and Understanding</p> <p>i. select appropriate mathematics when solving problems in both familiar and unfamiliar situations</p> | <p>A-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p>A-CED.A.1 Create equations and inequalities in one variable and use them to solve problems.</p> <p>A-REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</p> <p>A.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.</p> |

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| | | <p>accuracy of their solution and the relationship it has with the real-life context.</p> <p>Task 4 -Salary & Living Costs Comparison Project (Career connections)</p> | <p>ii. apply the selected mathematics successfully when solving problems.</p> <p>iii. solve problems correctly in a variety of contexts</p> <p>Task 2 - Literal Equations Project</p> <p>Criterion C: Communication</p> <p>i. use appropriate mathematical language (notation, symbols, and terminology) in both oral and written explanations</p> <p>iv. communicate complete, coherent, and concise mathematical lines of reasoning</p> <p>v. organize information using a logical structure</p> <p>Task 3 - CSI stats: The Case of the Missing Cookies</p> <p>Criterion D: Applying Mathematics in Real-life Contexts</p> <p>i. identify relevant elements of authentic real-life situations</p> <p>ii. select appropriate mathematical strategies when solving authentic real-life situations</p> <p>iii. apply the selected mathematical strategies</p> | <p>A.CED.A.1</p> <p>Create equations and inequalities in one variable and use them to solve problems.</p> <p>N.Q.A.2</p> <p>Define appropriate quantities for the purpose of descriptive modeling.</p> <p>A.REI.D.10</p> <p>Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p>A-CED.A.2</p> <p>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p>A-REI.D.12</p> <p>Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</p> <p>A-REI.C.6</p> <p>Solve systems of linear equations exactly and approximately (e.g., with</p> |
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| | | | <p>successfully to reach a solution</p> <p>iv. justify the degree of accuracy of a solution</p> <p>v. justify whether a solution makes sense in the context of authentic real-life situation</p> | <p>graphs), focusing on pairs of linear equations in two variables.</p> <p>A-REI.C.5</p> <p>Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</p> <p>F.BF.B.3</p> <p>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.</p> <p>F.IF.C.7b</p> <p>Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.</p> <p>S-ID.B.6.c</p> <p>Fit a linear function for a scatter plot that suggests a linear association.</p> <p>S-ID.B.6.a</p> |
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| | | | | <p>Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</p> <p>S-ID.C.7</p> <p>Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p> <p>S-ID.C.8</p> <p>Compute (using technology) and interpret the correlation coefficient of a linear fit.</p> |
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| Unit 2- Exponential Functions | <p>Key: Relationships Related: Change, models</p> <p>GC: Globalization and sustainability</p> <p>Exploration: Population</p> | <p>SOI: Models allow for the exploration of population changes and relationships.</p> <p>Summative Tasks: Task 1 - AACPS Quarter 2 Assessment: The summative assessment task assesses students understanding of relationships over time to predict change.</p> | <p>ATL: Communication: Communication skills</p> <p>Social: Collaboration skills</p> <p>Self-Management: Affective skills</p> | <p>Objective: Simplify expressions involving zero exponents, negative exponents, multiplication and division with exponents, as well as raising a power to another power.</p> <p>4.2 - Key Features of Exponential Functions</p> <p>F-IF.C.7.e</p> <p>Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric</p> |

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| | | <p>Task 2 - Math Lab: Mold</p> <p>G - You work for a small, local bread company and notice that the shelf life of your bread loaves is a complaint from consumers. You have been asked to investigate the rate of mold growth on bread and create a model</p> <p>R - You have been asked to take pictures and record surface area of mold growth on bread over several days</p> <p>A - Your colleagues (class)</p> <p>S - The context you find yourself in is measuring mold growth on bread over time to understand growth rate</p> <p>P - You will create a presentation (poster, powerpoint, prezi, other approved form) in order to represent your data in written and visual forms</p> <p>S - You will be evaluated using Criteria B and C.</p> <p><u>Alternative assignment for Task 2:</u></p> <p><i>Use "Disease Spread" Gizmo simulation in classrooms where mold growth is a concern. Teacher would focus on <u>disease</u> growth instead of <u>mold</u> growth and adapt paperwork accordingly. Have students run the same simulation multiple times/compare their data for a larger sample size.</i></p> | <p>IB MYP Math Objectives:</p> <p>Task 1 – Quarter 2 Assessment</p> <p>Criterion A: Knowing and Understanding</p> <p>i. select appropriate mathematics when solving problems in both familiar and unfamiliar situations</p> <p>ii. apply the selected mathematics successfully when solving problems</p> <p>iii. solve problems correctly in a variety of contexts.</p> <p>Task 2 - Math Lab: Mold</p> <p>Criterion B: Investigating Patterns</p> <p>i. select and apply mathematical problem-solving techniques to discover complex patterns</p> <p>ii. describe patterns as general rules consistent with findings</p> <p>iii. prove, or verify and justify, general rules</p> <p>Criterion C: Communicating</p> <p>i. use appropriate mathematical language (notation, symbols and</p> | <p>functions, showing period, midline, and amplitude.</p> <p>F-IF.B.4</p> <p>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.</p> <p>F-IF.B.5</p> <p>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.</p> <p>F-FI.C.9</p> <p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).</p> <p>F-LE.A.2</p> <p>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).</p> <p>Objective: Students will be able to model real-world phenomena using exponential functions of the form $y = a(1 \pm r)^t$.</p> |
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| | | | <p>terminology) in both oral and written explanations</p> <p>iv. communicate complete, coherent and concise mathematical lines of reasoning</p> <p>v. organize information using a logical structure</p> | <p>F-IF.C.7.e</p> <p>Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.</p> <p>A.SSE.A.1.b</p> <p>Interpret complicated expressions by viewing one or more of their parts as a single entity.</p> <p>A.CED.A.2</p> <p>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p>F-IF.C.8</p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>F-IF.C.8.b</p> <p>Use the properties of exponents to interpret expressions for exponential functions.</p> <p>A-SSE.B.3.c</p> <p>Use the properties of exponents to transform expressions for exponential functions.</p> <p>F-LE.A.1.c</p> |
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| | | | <p>Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</p> <p>F-LE.B.5</p> <p>Interpret the parameters in a linear or exponential function in terms of a context.</p> <p>4.4 - Transformations of Exponential Functions</p> <p>Objective: Explore transformations of the graph of an exponential function using the form $y = ab^{x-h} + k$</p> <p>F.BF.B.3</p> <p>Explore the properties of the form $y = a^x$</p> <p>4.5 - Solving Exponential Equations</p> <p>Objective: Solve exponential equations using properties of exponents and common base properties.</p> <p>A.CED.1: Create equations and inequalities in one variable and use them to solve problems.</p> <p>A.REI.11: Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the</p> |
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| | | | <p>functions, make tables of values, or find successive approximations.</p> <p>4.6 - Geometric Sequences</p> <p>Objective: Write and use explicit and recursive formulas for geometric sequences</p> <p><u>F-BF.A.2:</u> Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.</p> <p><u>F-BF.A.1.a:</u> Determine an explicit expression, a recursive process, or steps for calculation from a context.</p> <p><u>F-LE.A.2:</u> 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).</p> <p>4.7 Comparing Linear and Exponential Functions</p> <p>Objective: Compare linear and exponential functions.</p> <p><u>F-LE.1:</u> Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.</p> <p><u>F-IF.6:</u> Calculate and interpret the average rate of change of a</p> |
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| | | | | <p>function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</p> <p>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.</p> |
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| <p>Unit 3: Quadratics, Functions, and Function Families Extended</p> | <p>Key: Form</p> <p>Related: Equivalence, Patterns, Models</p> <p>GC: Scientific and technical innovation</p> <p>Exploration: processes and solutions</p> | <p>SOL: Representing patterns through equivalent forms of models helps determine the appropriate process that leads to solutions.</p> <p>Summative Tasks: Task 1 : Quarter 3 Assessment: The summative assessment task assesses students understanding of equivalent forms of quadratic functions and using the various forms to solve problems. Task 2: Assessing Equivalent Forms of Quadratic Equations – Applying Mathematics in Real Life Context</p> <p>You are a collegiate Track and Field coach. You are currently working with three student-athletes to increase their capacity for their</p> | <p>ATL</p> <p>Thinking- Critical-thinking skills</p> <p>Self-management - Affective skills</p> <p>Social - Organization skills</p> <p>Communication - Communication skills</p> <p>Task 1 – Quarter 3 Assessment</p> <p>Criterion A: Knowing and Understanding</p> | <p>5.1 Monomial and Binomial Operations</p> <p><u>CCSS.MATH.CONTENT.HSA.APR.A.1</u></p> <p>Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials</p> <p>5.2 Quadratic Graphs and their Properties and the Discriminant</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.B.4</u></p> <p>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features</p> |

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| | | <p>specific event. Mary is a long jumper. Jenn is a high jumper. Adam is deciding which event, long jump or high jump, he should pursue.</p> <p>Mary's long jump path can be modeled by the quadratic function. Create an equivalent model that would allow you to determine the length of her jump.</p> <p>How far can Mary jump?</p> <p>Jenn's high jump path can be modeled by the quadratic function. Use completing the square to create an equivalent model that would allow you to determine the height of her jump.</p> <p>What is Jenn's maximum height?</p> <p>Task 3 - Investigation</p> <p>Students will build a small catapult to launch different materials, so that they can collect data such as distance and height in order to form a mathematical model of the device's flight path. Students will then use this model to attempt to hit a target with a mystery material that will be revealed shortly before its launch.</p> | <p>i. select appropriate mathematics when solving problems in both familiar and unfamiliar situations</p> <p>ii. apply the selected mathematics successfully when solving problems</p> <p>iii. solve problems correctly in a variety of contexts.</p> <p>Task 2: Assessing Equivalent Forms of Quadratic Equations</p> <p>Criterion Di, ii, iii, iv, v</p> <p>Criterion B: Investigating Patterns</p> <p>i. select and apply mathematical problem solving techniques to discover complex patterns</p> <p>ii. describe patterns as general rules consistent with findings</p> <p>iii. prove, or verify and justify, general rules.</p> <p>Criterion D: Applying mathematics in real-life contexts</p> <p>i. identify relevant elements of authentic real-life situations</p> | <p>given a verbal description of the relationship. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*</i></p> <p><u>CCSS.MATH.CONTENT.HSF.IF.B.5</u></p> <p>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. <i>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.*</i></p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.7</u></p> <p>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.9</u></p> <p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum</i></p> |
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| | | | <p>ii. select appropriate mathematical strategies when solving authentic real-life situations</p> <p>iii. apply the selected mathematical strategies successfully to reach a solution</p> <p>Task 3 -</p> <p>Criterion B: Investigating patterns</p> <p>i. select and apply mathematical problem-solving techniques to discover complex patterns</p> <p>ii. describe patterns as general rules consistent with findings</p> <p>iii. prove, or verify and justify, general rules.</p> <p>Criterion C: Communicating</p> <p>ii. use appropriate forms of mathematical representation to present information.</p> <p>iv. communicate complete, coherent and concise mathematical lines of reasoning</p> <p>v. organize information in a logical structure.</p> | <p>5.3 Applications of Quadratic Functions</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.7</u></p> <p>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.8</u></p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.9</u></p> <p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</i></p> <p><u>CCSS.MATH.CONTENT.HSF.IF.B.4</u></p> <p>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and</i></p> |
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| | | | | <p><i>minimums; symmetries; end behavior; and periodicity.*</i></p> <p>5.4 Standard Form of a Quadratic Function</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.B.4</u></p> <p>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*</i></p> <p><u>CCSS.MATH.CONTENT.HSF.IF.B.6</u></p> <p>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.*</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.8</u></p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.9</u></p> <p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal</p> |
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| | | | | <p>descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</i></p> <p>5.5 Multiplying and Factoring Special Cases</p> <p><u>CCSS.MATH.CONTENT.HSA.SSE.A.1</u></p> <p>Interpret expressions that represent a quantity in terms of its context.*</p> <p><u>CCSS.MATH.CONTENT.HSA.SSE.A.2</u></p> <p>Use the structure of an expression to identify ways to rewrite it. <i>For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</i></p> <p>5.6 Factoring to Solve Quadratic Equations (intercept Form)</p> <p><u>CCSS.MATH.CONTENT.HSA.REI.B.4</u></p> <p>Solve quadratic equations in one variable.</p> <p><u>CCSS.MATH.CONTENT.HSA.SSE.A.1</u></p> <p>Interpret expressions that represent a quantity in terms of its context.*</p> <p><u>CCSS.MATH.CONTENT.HSA.SSE.B.3</u></p> <p>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*</p> <p><u>CCSS.MATH.CONTENT.HSA.CED.A.1</u></p> |
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| | | | | <p>Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i></p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.8</u></p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>5.7 Quadratic Functions and Transformations (Vertex Form)</p> <p><u>CCSS.MATH.CONTENT.HSF.BF.B.3</u></p> <p>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.</p> <p>5.8 Completing the Square to Rewrite and Solve</p> <p><u>CCSS.MATH.CONTENT.HSA.REI.A.1</u></p> <p>Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a</p> |
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| | | | | <p>viable argument to justify a solution method.</p> <p><u>CCSS.MATH.CONTENT.HSA.REI.B.4</u></p> <p>Solve quadratic equations in one variable.</p> <p>5.9 The Quadratic Formula and the Discriminant</p> <p><u>CCSS.MATH.CONTENT.HSA.REI.B.4</u></p> <p>Solve quadratic equations in one variable.</p> <p>5.10 investigating the Equivalent Forms of Quadratic Functions</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.8</u></p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>5.10 investigating the Equivalent Forms of Quadratic Functions</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.8</u></p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>6.1 Quadratic Systems</p> <p><u>CCSS.MATH.CONTENT.HSA.REI.C.7</u></p> <p>Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of</p> |
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| | | | | <p>intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.</p> <p><u>CCSS.MATH.CONTENT.HSA.REI.D.1.1</u></p> <p>Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*</p> <p><u>CCSS.MATH.CONTENT.HSA.CED.A.3</u></p> <p>Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i></p> <p>6.2 Linear, Quadratic and Exponential Models</p> <p><u>CCSS.MATH.CONTENT.HSF.LE.A.1</u></p> <p>Distinguish between situations that can be modeled with linear functions and with exponential functions.</p> <p><u>CCSS.MATH.CONTENT.HSF.LE.A.2</u></p> |
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| | | | | <p>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).</p> <p><u>CCSS.MATH.CONTENT.HSF.LE.A.3</u></p> <p>Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.</p> |
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| | GLOBAL CONTEXT AND EXPLORATION | SUMMATIVE ASSESSMENT TASK | IB MYP MATHEMATICS OBJECTIVES | |
| Unit 4- Mathematics all around us! | <p>Key: Relationships Related: Patterns, representation</p> <p>GC: Scientific and technical innovation</p> <p>Exploration: Models and method</p> | <p>SOI: Relationships are represented through patterns seen in various models and methods.</p> <p>Summative Tasks: Task 1 - Quarter 4 Assessment: The summative assessment task assesses students understanding about representing data, exploring patterns, and creating models based on quantitative relationships to make predictions.</p> <p>Task 2 - Statistical Investigation Students will take a survey and eventually convert class data into a</p> | <p>ATL: Thinking- Critical thinking Research - Information literacy Communication - communication Self-management - Affective skills</p> <p>Task 1: Quarter 4 Assessment Criterion A: Knowing and understanding i. select appropriate mathematics when solving</p> | <p>7.1 Measures of Center</p> <p><u>CCSS.MATH.CONTENT.HSS.ID.A.2</u> Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</p> <p><u>CCSS.MATH.CONTENT.HSS.ID.A.3</u> Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</p> <p><u>CCSS.MATH.CONTENT.HSN.Q.A.2</u></p> |

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| | | <p>proper model of their choosing with further analysis. Final product is a presentation of their data (PP, Poster, Video, Report, etc.) to the class.</p> <p>Task 3 - Interpreting Piecewise Functions in Real Life Context</p> <p>Show students different examples of graphs created from their extracurricular activities that involve movement.</p> <p>Students are shown a graph and table of values of a piecewise function where the first piece is an exponential function and the second piece is a quadratic function.</p> <p>Students must create a story about that graph in a real-world setting based on the rubric given.</p> | <p>problems in both familiar and unfamiliar situations</p> <p>ii. apply the selected mathematics successfully when solving problems</p> <p>iii. solve problems correctly in a variety of contexts</p> <p>Task 2 - Investigation Criterion B: Investigating patterns</p> <p>ii. describe patterns as general rules consistent with findings</p> <p>Criterion C: Communicating</p> <p>i. use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations</p> <p>ii. use appropriate forms of mathematical representation</p> <p>iii. move between different forms of mathematical representation</p> <p>iv. communicate complete, coherent, and concise mathematical lines of reasoning</p> <p>v. organize information using a logical structure</p> <p>Task 3: Interpreting Piecewise Functions in Real Life Context Criterion C: Communicating</p> | <p>Define appropriate quantities for the purpose of descriptive modeling.</p> <p><u>7.2 Interpreting Frequency and Histograms</u></p> <p><u>CCSS.MATH.CONTENT.HSS.ID.A.1</u> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><u>7.3 Box and Whisker Plots</u></p> <p><u>CCSS.MATH.CONTENT.HSS.ID.A.1</u> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><u>CCSS.MATH.CONTENT.HSN.O.A.1</u> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> <p><u>CCSS.MATH.CONTENT.HSS.ID.A.2</u> Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</p> <p><u>7.4 Theoretical and Experimental Probability</u></p> <p><u>CCSS.MATH.CONTENT.HSS.CP.A.1</u></p> |
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| | | | <p>i. use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations</p> <p>iii. move between different forms of mathematical representation</p> <p>iv. communicate complete, coherent, and concise mathematical lines of reasoning</p> <p>v. organize information using a logical structure</p> | <p>Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").</p> <p><u>CCSS.MATH.CONTENT.HSS.CP.A.4</u></p> <p>Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.</p> <p><u>8.1 Piecewise Functions</u></p> <p><u>CCSS.MATH.CONTENT.HSF.IF.B.4</u></p> <p>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.</p> <p><u>CCSS.MATH.CONTENT.HSF.IF.C.7.B</u></p> <p>Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.</p> |
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| | | | | <p><u>CCSS.MATH.CONTENT.HSF.BF.B.3</u></p> <p>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.</p> <p><u>8.2 Absolute Value Equations and Functions</u></p> <p><u>CCSS.MATH.CONTENT.HSA.CED.A.1</u></p> <p>Create equations and inequalities in one variable and use them to solve problems.</p> <p><u>CCSS.MATH.CONTENT.HSA.SSE.A.1.B</u></p> <p>Interpret complicated expressions by viewing one or more of their parts as a single entity.</p> <p><u>8.3 Inverses</u></p> <p><u>CCSS.MATH.CONTENT.HSF.BF.B.4</u></p> <p>Find inverse functions.</p> <p><u>CCSS.MATH.CONTENT.HSF.BF.B.4.A</u></p> <p>Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for</p> |
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| | | | | <p>the inverse. For example, $f(x) = 2x^3$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$.</p> <p><u>CCSS.MATH.CONTENT.HSF.BF.B.4.B</u></p> <p>Verify by composition that one function is the inverse of another.</p> <p><u>CCSS.MATH.CONTENT.HSF.BF.B.4.C</u></p> <p>Read values of an inverse function from a graph or a table, given that the function has an inverse.</p> |
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