Math 3

Year 1 of Implementation

East High School

72 Minute Blocks

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| --- | --- | --- | --- | --- | --- | --- |
| Unit | CCSSM Content Standards | CCSSM Practice Standards | Investigations/Additional Work | Big Ideas of the Unit | Essential Questions | Time Frame |
| Unit 1: Probability Distributions | S.CP.1  S.CP.7  S.MD.1  S.MD.3  G.MG.2  S.ID.1  S.MD.4  Connected to:  A.CED.2  S.ID.2  S.ID.5  S.MD.2 | Opportunities to engage in the standards for mathematics practice | CORE1: Unit 8 Probability  Lesson 1: Calculating Probabilities  Lesson 2: Modeling Chance situations, Investigations 1 & 2 only | Construct sample spaces for chance situations  Construct probability distribution A(and)B | What is a sample space and how can it be useful in finding probability?  What is a probability distribution and how is it used?  How can an area model be used to find probability?  How does the relationship between two events affect  What is expected value and how is it used? | About 10 days |
| Unit 2: Patterns of Change, Linear Functions | Part A:  A.SSE.1  A.REI.10  F.IF.4  F.IF.5  F.LE.5  S.ID.6  S.ID.7  Connected to: N.Q.2  N.Q.3  A.CED.2  F.IF.1  F.IF.2  F.BF.1  Part B:  N.RN.1  N.RN.2  A.SSE.1  A.SSE.3  A.CED.1  A.CED.2  A.REI.10  F.IF.3  F.IF.4  F.IF.5  F.IF.6  F.IF.7  F.BF.1  F.BF.2  F.LEI.1  F.LE.2  F.LE.5  S.ID.6  S.ID.7  Connected to N.Q.1  A.REI.1  F.IF.3  F.IF.4  F.IF.9  F.LE.1  F.BF.3 | Opportunities to engage in the standards for mathematics practice | The purpose of this unit is to review familiar functions but from a multiple representation perspective.  Part A: CORE 1: Unit 1-- Patterns of Change  Lesson 1:Cause and Effect  Investigation 1: Physics and Business at Five Star Amusement Park  Investigation 3 Trying to get rich  OYO for additional practice  Lesson 2: Change over Time  Investigation 1: Predicting Population Change  (If time and technology available can do investigation 2 with spreadsheets)  OYO for additional practice  Lesson 3: Tools for Studying Patterns of Change  Investigation 2: Quick tables, graphs and solutions  Investigation 3: Shapes of Algebra  OYO for additional practice  Looking Back—additional practice  Part B:  CORE 1:  Unit 3:  Lesson 1:  Modeling Linear Functions  Lesson 2: Investigation 1 only | Part A: How variables are related  Multiple Representation  Patterns of Change  Recursive relationships  Part B:  Determine relationships among graph, symbolic rule, table of values and related situation for a linear function  Interpret the slope and y-intercept in the context  Write rules for linear functions  Estimate the graph and function rule for a line of best fit by hand and using technology  Use a linear function to answer questions about situations  Writing rules for linear functions | Part A: How are variables related?  How can multiple representation be used to make sense of functions?  How can we describe the patterns of change of a relationship?  What does it mean to represent a relationship recursively?  How can technology be used as a tool to deepen our understanding?  Part B: How can multiple representation be used to make sense of linear or exponential  functions?  How can data be modeled and the model used to answer questions about situations? | About 13 Class Days |
| Unit 3: Reasoning about Statistics: Standard Deviation and the Normal Distribution | S.ID.1  S.ID.2  S.ID.3  Connected to:  N.Q.1  G.CO.2  G.CO.6  S.ID.6 | Opportunities to engage in the standards for mathematics practice | Statistical Reasoning:  CORE 1  Unit 2: Lesson 2: Investigation 4  Core 3: Unit 4:  Lesson 1 | Variation  Standard Deviation  The effect of outliers  Normal distributions | What does the standard deviation tell you about a distribution?  What is a normal distribution and how is it used to describe data? | About 8 Class Days |
| Unit 4: Exponential Functions | N.RN.1  N.RN.2  A.SSE.1  A.SSE.3  A.CED.1  A.CED.2  A.REI.10  F.IF.3  F.IF.4  F.IF.5  F.IF.6  F.IF.7  F.BF.1  F.BF.2  F.LEI.1  F.LE.2  F.LE.5  S.ID.6  S.ID.7  Connected to N.Q.1  A.REI.1  F.IF.3  F.IF.4  F.IF.9  F.LE.1  F.BF.3 | Opportunities to engage in the standards for mathematics practice | CORE 1:  Unit 5:  Lesson 1: Exponential Growth  Investigation 1: Counting on Tree Graphs  Investigation 2: Getting Started  Investigation 3: Compound Interest  Investigation 4: Regression  Lesson 2: Exponentials Decay  Investigation 1: More Bounce to the Ounce  Investigation 2: Medicine and Mathematics  OYO for additional practice | Recognize and represent exponential growth and decay patterns  Use multiple representation to make sense of exponential models  Use reasoning, estimation and curve fitting to model data patterns exhibiting exponential patterns  Write rules describing exponential patterns  Use exponential rules to answer questions about situations  Compare linear & exponential functions | How can multiple representation be used to make sense of linear or exponential  functions?  How can data be modeled and the model used to answer questions about situations? | About 6 class days |
| Unit 5: Introduction to Graph Theory | N.VM.6  N.VM.7  N.VM.8  G.MG.3  Modeling  Connected to  A.CED.2  A.CED.4 | Opportunities to engage in the standards for mathematics practice | CORE 1:  Unit 4: Discrete Mathematical Modeling  Lesson 1: Euler Circuits  Lesson 2: Vertex Coloring: Avoiding Conflict | Use vertex-edge graphs to model problems  Use Euler circuits to solve problems  Use matrices to represent and analyze graphs  Use vertex coloring to solve a variety of problems  Use vertex edge graphs to solve problems involving optimization | How can vertex edge graphs be used to model and solve problems? | About 10 Class Days |
| Unit 6: Quadratic Functions | A.SSE.1  A.SSE.3  A.CED.1  A.CED.2  A.REI.10  F.IF.3  F.IF.4  F.IF.5  F.IF.6  F.IF.7  F.BF.1  F.BF.2  F.LEI.1  F.LE.2  F.LE.5  S.ID.6  S.ID.7  Connected to N.Q.1  A.REI.1  F.IF.3  F.IF.4  F.IF.9  F.LE.1  F.BF.3 | Opportunities to engage in the standards for mathematics practice | Core 1:  Unit 7 Quadratic Functions—Emphasize lessons 1: Quadratic Patterns and Lesson 3: Solving Quadratic Equations | Quadratic Relations and Equations:  Use context to make sense of quadratic relations; Solve quadratic equations using tables, graphs, and the quadratic formula | How can you recognize a quadratic relation? How can multiple representation be used to make sense of quadratic relations? | About 6 class days |
| Unit 7: Matrices and Systems | N.VM.6  N.VM.7  N.VM.8  N.VM.9  N1.VM.10  A.CED.2  A.CED.3  A.REI.1  A.REI.6  A.REI.8  A.REI.9  A.REI.11  A.FB.1  Connected to:  A.SSE.1  A.SSE.3  A.CED.4  A.REI.3  A.REI.4  F.BF.1  F.IF.3  F.LE.5 | Opportunities to engage in the standards for mathematics practice | CORE 2: Unit 1: Lesson 3: Systems of Linear Equations  Unit 2: Matrix Methods  Lesson 1: Constructing, Interpreting and Operating on Matrices  Lesson 2: Multiplying Matrices  Unit 2: Matrix Methods  Lesson 3: Systems of Linear Equations | Part A--Solving Linear Systems is a review unit from 8th and Algebra, but emphasize using context, writing equations, using different strategies, as well as analyzing systems for no, one, and infinite number of solutions  Use graphing calculator as a tool as well as algebraic manipulation  Begin to discuss when to use what strategy (efficiency)  Part B—Matrices  Constructing matrices to organize, display, interpret and analyze a situation  Understand. carry out and interpret matrix operations  Use matrix operations to solve problems  Examine the properties of operations and matrices and compare those with real numbers  Use matrices to solve systems of linear equations using technology | Part A: How can a system of equations be used to solve problems?  Which method is more efficient when?  How can you tell by examining a system how many solutions it has?  Part B—How can matrices be used to describe, interpret, and analyze problem situations?  How can matrix operations be used to solve problem situations?  How can matrices be used to solve systems of linear equations? | About 13 Days |
| Unit 8: Trigonometry: Solving Triangles | G.SRT.6  G.SRT.7  G.SRT.8  G.SRT.9  G.SRT.10  G.SRT.11  Connected to  N.A.3  A.SEE.1  A.REI.11  G.MG.1  G.MG.3  F.IF.7  F.IF.8 | Opportunities to engage in the standards for mathematics practice | CORE 2:  Unit 7: Trigonometric Methods  Lesson 1: Trigonometric Functions  Lesson 2: Using Trigonometry in Any Triangle,  Investigations 1 & 2 only | Explore properties of sine, cosine and tangent ratios of acute angles in right triangles and use those ratios to solve applied problems.  Use the Law of Sines and Law of Cosines to solve a variety of applied triangles that involve triangulation.  (Optional: SSA special cases) | How can trigonometry be used to solve problems in context?  How can the properties of sine, cosine and tangent ratios be used to solve applied problems? | About 14 Class Days |

Additional Ideas for future consideration:

1. CORE 2: Direct and Inverse Variation

2. CORE 2: Nonlinear Functions and Equations

3. CORE 3: Statistical Reasoning

4. CORE 3: Inequalities and Linear Programming