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.1S.CP.7S.MD.1S.MD.3G.MG.2S.ID.1S.MD.4Connected to:A.CED.2S.ID.2S.ID.5S.MD.2 | Opportunities to engage in the standards for mathematics practice | CORE1: Unit 8 ProbabilityLesson 1: Calculating ProbabilitiesLesson 2: Modeling Chance situations, Investigations 1 & 2 only | Construct sample spaces for chance situationsConstruct 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 affectWhat is expected value and how is it used? | About 10 days |
| Unit 2: Patterns of Change, Linear Functions | Part A:A.SSE.1A.REI.10F.IF.4F.IF.5F.LE.5S.ID.6S.ID.7Connected to: N.Q.2N.Q.3A.CED.2F.IF.1F.IF.2F.BF.1Part B:N.RN.1N.RN.2A.SSE.1A.SSE.3A.CED.1A.CED.2A.REI.10F.IF.3F.IF.4F.IF.5F.IF.6F.IF.7F.BF.1F.BF.2F.LEI.1F.LE.2F.LE.5S.ID.6S.ID.7Connected to N.Q.1A.REI.1F.IF.3F.IF.4F.IF.9F.LE.1F.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 ChangeLesson 1:Cause and EffectInvestigation 1: Physics and Business at Five Star Amusement ParkInvestigation 3 Trying to get richOYO for additional practiceLesson 2: Change over TimeInvestigation 1: Predicting Population Change(If time and technology available can do investigation 2 with spreadsheets)OYO for additional practiceLesson 3: Tools for Studying Patterns of ChangeInvestigation 2: Quick tables, graphs and solutionsInvestigation 3: Shapes of AlgebraOYO for additional practiceLooking Back—additional practicePart B:CORE 1:Unit 3:Lesson 1:Modeling Linear FunctionsLesson 2: Investigation 1 only | Part A: How variables are relatedMultiple RepresentationPatterns of ChangeRecursive relationshipsPart B: Determine relationships among graph, symbolic rule, table of values and related situation for a linear functionInterpret the slope and y-intercept in the context Write rules for linear functionsEstimate the graph and function rule for a line of best fit by hand and using technologyUse a linear function to answer questions about situationsWriting 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 exponentialfunctions?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.1S.ID.2S.ID.3Connected to:N.Q.1G.CO.2G.CO.6S.ID.6 | Opportunities to engage in the standards for mathematics practice | Statistical Reasoning:CORE 1Unit 2: Lesson 2: Investigation 4Core 3: Unit 4:Lesson 1 | VariationStandard DeviationThe effect of outliersNormal 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.1N.RN.2A.SSE.1A.SSE.3A.CED.1A.CED.2A.REI.10F.IF.3F.IF.4F.IF.5F.IF.6F.IF.7F.BF.1F.BF.2F.LEI.1F.LE.2F.LE.5S.ID.6S.ID.7Connected to N.Q.1A.REI.1F.IF.3F.IF.4F.IF.9F.LE.1F.BF.3 | Opportunities to engage in the standards for mathematics practice | CORE 1:Unit 5:Lesson 1: Exponential GrowthInvestigation 1: Counting on Tree GraphsInvestigation 2: Getting StartedInvestigation 3: Compound InterestInvestigation 4: RegressionLesson 2: Exponentials DecayInvestigation 1: More Bounce to the OunceInvestigation 2: Medicine and MathematicsOYO for additional practice | Recognize and represent exponential growth and decay patternsUse multiple representation to make sense of exponential modelsUse reasoning, estimation and curve fitting to model data patterns exhibiting exponential patternsWrite rules describing exponential patternsUse exponential rules to answer questions about situationsCompare linear & exponential functions | How can multiple representation be used to make sense of linear or exponentialfunctions?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.6N.VM.7N.VM.8G.MG.3ModelingConnected to A.CED.2A.CED.4 | Opportunities to engage in the standards for mathematics practice | CORE 1: Unit 4: Discrete Mathematical ModelingLesson 1: Euler CircuitsLesson 2: Vertex Coloring: Avoiding Conflict | Use vertex-edge graphs to model problemsUse Euler circuits to solve problemsUse matrices to represent and analyze graphsUse vertex coloring to solve a variety of problemsUse 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.1A.SSE.3A.CED.1A.CED.2A.REI.10F.IF.3F.IF.4F.IF.5F.IF.6F.IF.7F.BF.1F.BF.2F.LEI.1F.LE.2F.LE.5S.ID.6S.ID.7Connected to N.Q.1A.REI.1F.IF.3F.IF.4F.IF.9F.LE.1F.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.6N.VM.7N.VM.8N.VM.9N1.VM.10A.CED.2A.CED.3A.REI.1A.REI.6A.REI.8A.REI.9A.REI.11A.FB.1Connected to: A.SSE.1A.SSE.3A.CED.4A.REI.3A.REI.4F.BF.1F.IF.3F.LE.5 | Opportunities to engage in the standards for mathematics practice | CORE 2: Unit 1: Lesson 3: Systems of Linear EquationsUnit 2: Matrix MethodsLesson 1: Constructing, Interpreting and Operating on MatricesLesson 2: Multiplying MatricesUnit 2: Matrix MethodsLesson 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 solutionsUse graphing calculator as a tool as well as algebraic manipulationBegin to discuss when to use what strategy (efficiency)Part B—MatricesConstructing matrices to organize, display, interpret and analyze a situationUnderstand. carry out and interpret matrix operationsUse matrix operations to solve problemsExamine the properties of operations and matrices and compare those with real numbersUse 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.6G.SRT.7G.SRT.8G.SRT.9G.SRT.10G.SRT.11Connected to N.A.3A.SEE.1A.REI.11G.MG.1G.MG.3F.IF.7F.IF.8 | Opportunities to engage in the standards for mathematics practice | CORE 2: Unit 7: Trigonometric MethodsLesson 1: Trigonometric FunctionsLesson 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