SAN LEANDRO UNIFIED SCHOOL DISTRICT
COURSE PROPOSAL: Course of Study
SECTION A. COVER PAGE

1. **Course Title: Accelerated Math 7/8A**	7. **Action** ☑ New Course ▢ Course Revision ▢ Title Change Only
2. Date Submitted: May 15, 2020	8. **Grade Level**(s) ▢ 6 ▢9 ▢11 ☑ 7 ▢10 ▢12 ▢ 8
3. Transcript Title/Abbreviation(s) **Math 7/8A**	**9. Prerequisites** (Please list.) ▢ Required ☑ Recommended - Qualify for math acceleration via district criteria
4. Transcript Course Code/Course Number :	**10. Seeking Program Distinction?** ▢ YES (Check one below.) XNO ▢Honors ▢ AP ▢Other
5. Subject Area Mathematics	11. **Is this a CTE course?** ▢ YES ☑ NO **If YES, complete Section C**
6. **Department** Mathematics	12. **Previously approved by UC?** ▢ YES ▢ NO X NA for 6th-8th Year approved Year removed
13. UC ELIGIBILITY **Already eligible?** ☑ NA for 6th-8th ▢**YES** ▢**NO** **a**▢ **b**▢ **c**▢ **d**▢ **e**▢ **f**▢ **g**▢ **Proposing eligibility?**☑ NA for 6th-8th ▢**YES** ▢**NO** **a**▢ **b**▢ **c**▢ **d**▢ **e**▢ **f**▢ **g**▢ Please mark one for approved eligibility or proposed eligibility.	14. **Unit Value/Course Credit/Length of Course** ▢ 0.5 (semester or half-year X 1.0 (one year equivalent) ▢ 2.0 (two-year equivalent) ▢ Other
15. School Contact and Course Developer Name: Celine Liu Phone: 510-667-6215 Email: cliu@slusd.us Position: Coordinator	
16. Approval Signatures: **Approval Date: 5/15/20** Department Chair *Marina Martinez, Peter Fierro, Sonya Castillo*	**DISTRICT OFFICE USE ONLY**

Principal: *Vernon Walton and Valentin del Rio*	**Date approved by Board Curriculum Committee 5/19/20** **Date approved by Board**

SECTION B. COURSE CONTENT

17. Course Description

Accelerated Math 7/8A is a 7th grade course designed to address CA Common Core State Mathematics Standards of grades 7 and the first half of 8. Accelerated Math 7/8A will be taught in units designed to address, with equal intensity, conceptual understanding, procedural fluency, and application. Course topics include Ratios and Proportional Relationships; Rational Numbers; Expressions and Equations; Percent and Proportional Relationships; Statistics and Probability; Geometry; Integer Exponents and Scientific Notation; Concept of Congruence; Similarity; Linear Equations. Upon successful completion of Accelerated Math 7/8A, students will be prepared to enroll in Accelerated Math 8B/Algebra 1.

18. Course Goals and/or Major Student Outcomes

As a result of this course, students should develop proficiency in the following critical areas of Math 7 and Math 8:

- Developing understanding of and applying proportional relationships;
- Developing understanding of operations with rational numbers and working with expressions and linear equations;
- Solving problems that involve scale drawings and informal geometric constructions and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume;
- Drawing inferences about populations based on samples;
- Work toward developing fluency in solving equations of the form $px + q = r$ and $p(x + q) = r$;
- Formulating and reasoning about expressions and equations;
- Analyzing 2- and 3-dimensional space and figures using distance, angle, similarity, and congruence.

Major student outcomes are focused in 5 critical areas of Math 7 and Math 8:

(1) developing understanding of and applying proportional relationship (7th grade), extended with concept of modeling relationships with linear equations (8th), understand the connection between proportional relationships, lines, and linear equations (8th);

(2) developing a unified understanding of number and properties of operations, extend operations to rational numbers and algebraic expressions (7th), introduce concept of irrational number and approximation (8th);
(3) working with expressions and linear equations to model and solve real-life and mathematical problems (7th), choose and efficiently implement procedures to solve linear equa ons in one variable, understanding properties of equality and logical equivalence (8th), embed in problem solving, informal analysis and graphing of linear equations in two variables and make meaning of slope and intercepts in context of problems, translate between various representations of linear relationships (8th);

(4) developing understanding of statistics and probability with a focus on using random sampling to draw inferences, comparing two distributions, and probability (7th), and investigating patterns of association in bivariate data, through scatter plots, linear modeling and two-way tables (8th);

(5) working with two- and three-dimensional space and figures using distance, angle, transformations, congruence and similarity, to solve problems involving area, surface area, and volume, solving problems involving scale drawings (proportional relationships), producing informal geometric constructions, and understanding and applying the Pythagorean Theorem (7th and 8th).

8th grade standards deferred to 8th grade Algebra
● Systems of equations
● Radicals and integer exponents
● Formal functions (should embed concept in problem solving but leave formal introduction to Algebra 1)

Course Objectives (standards)
Ratios and Proportional Relationships
- Analyze proportional rela onships and use them to solve real-world and mathematiocal problems (7th)

The Number System
- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers (7th)
- Know that there are numbers that are not rational, and approximate them by rational numbers (8th)

Expressions and Equations
- Use properties of operations to generate equivalent expressions (7th)
- Understand the connection between proportional relationships, lines, and linear equations (8th)
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations (7th) to model relationships between quantities (8th)

Geometry
- Draw, construct and describe geometric figures and describe the relationships between them (7th)
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume of cubes, right prisms, cylinders, cones, and spheres. (7th)

- Understand congruence and similarity through transformations using physical models, transparencies, or geometry so□ware (8th)
- Understand and apply the Pythagorean Theorem and connect to the coordinate plane (8th)

Statistics and Probability

- Use random sampling to draw inferences about a population (7th)
- Draw informal comparative inferences about two populations (7th)
- Investigate change processes and develop, use, and evaluate probability models (7th)
- Investigate patterns of association in bivariate data (8th)

20. Course Outline

Unit 1: Integer Operations
Module 7.2: Rational Numbers
Students build on their understanding of rational numbers from grade 6 to add, subtract, multiply, and divide signed numbers. Previous work in computing the sums, differences, products, and quotients of fractions and decimals serves as a significant foundation as well.

Unit 2: Expressions, Equations, and Inequalities
Module 7.3, 8.4
Module 7.3 consolidates and expands upon students' understanding of equivalent expressions as they apply the properties of operations (associative, commutative, and distributive) to write expressions in both standard form (by expanding products into sums) and in factored form (by expanding sums into products). They use linear equations to solve unknown angle problems and other problems presented within context to understand that solving algebraic equations is all about the numbers. It is assumed that a number already exists to satisfy the equation and context; we just need to discover it. A number sentence is an equation that is said to be true if both numerical expressions evaluate to the same number; it is said to be false otherwise. Students use the number line to understand the properties of inequality and recognize when to *preserve the inequality* and when to *reverse the inequality* when solving problems leading to inequalities. They interpret solutions within the context of problems.

To begin this module, students will generate equivalent expressions using the fact that addition and multiplication can be done in any order with any grouping and will extend this understanding to subtraction (adding the inverse) and division (multiplying by the multiplicative inverse, also known as the reciprocal) (**7.EE.A.1**). They extend the properties of operations with numbers (learned in earlier grades) and recognize how the same properties hold true for letters that represent numbers. Knowledge of rational number operations from Module 2 is demonstrated as students collect like terms containing both positive and negative integers.

An area model is used as a tool for students to rewrite products as sums and sums as products and to provide a visual representation leading students to recognize the repeated use of the distributive property in factoring and expanding linear expressions

(**7.EE.A.1**). Students examine situations where more than one form of an expression may be used to represent the same context, and they see how looking at each form can bring a new perspective (and thus deeper understanding) to the problem. Students recognize and use the identity properties and the existence of additive inverses to efficiently write equivalent expressions in standard form. By the end of the topic, students have the opportunity to practice knowledge of operations with rational numbers gained in Module 2 (**7.NS.A.1**, **7.NS.A.2**) as they collect like terms with rational number coefficients (**7.EE.A.1**).

In the 8th grade module, students extend what they already know about unit rates and proportional relationships to linear equations and their graphs. Students understand the connections between proportional relationships, lines, and linear equations in this module (**8.EE.B.5**, **8.EE.B.6**). Also, students learn to apply the skills they acquired in Grades 6 and 7 with respect to symbolic notation and properties of equality (**6.EE.A.2**, **7.EE.A.1**, **7.EE.B.4**) to transcribe and solve equations in one variable and then in two variables.

Unit 3: Ratios, proportions, and percents
Module 7.1, 7.4

In Module 7.1, students build upon their Grade 6 reasoning about ratios, rates, and unit rates (6.RP.A.1, 6.RP.A.2, 6.RP.A.3) to formally define proportional relationships and the constant of proportionality (7.RP.A.2). In Topic A, students examine situations carefully to determine if they are describing a proportional relationship. Their analysis is applied to relationships given in tables, graphs, and verbal descriptions (7.RP.A.2a).

In Module 7.4, students deepen their understanding of ratios and proportional relationships from Module 1 (**7.RP.A.1**, **7.RP.A.2**, **7.RP.A.3**, **7.EE.B.4**, **7.G.A.1**) by solving a variety of percent problems. They convert between fractions, decimals, and percents to further develop a conceptual understanding of percent (introduced in Grade 6 Module 1) and use algebraic expressions and equations to represent and solve multi-step percent scenarios (**7.EE.B.3**). An initial focus on relating 100*%* to *the whole* serves as a foundation for students. Students begin the module by solving problems without the use of a calculator to develop a greater fluency and deeper reasoning behind calculations with percent. Material in early lessons is designed to reinforce students' understanding by having them use mental math and basic computational skills. To develop a conceptual understanding, students use visual models and equations, building on earlier work with these strategies.

Unit 4: Proportional relationships, lines, and linear equations
Module 8.4
(Systems as extension)
In this Unit, students extend what they already know about unit rates and proportional relationships (6.RP.A.2, 7.RP.A.2) to linear equations and their graphs. Students understand the connections between proportional relationships, lines, and linear equations in this module (8.EE.B.5, 8.EE.B.6). Also, students learn to apply the skills they acquired in Grades 6 and 7 with respect to symbolic notation and properties of equality

(6.EE.A.2, 7.EE.A.1, 7.EE.B.4) to transcribe and solve equations in one variable and then in two variables.

Unit 5: Probability and Statistics
Module 7.5

In this unit, students begin their study of probability, learning how to interpret probabilities and how to compute probabilities in simple settings. They also learn how to estimate probabilities empirically. The concept of probability provides a foundation for the thinking required to make inferential reasoning that is developed in the second half of this module. Additionally, students build on their knowledge of data distributions that they studied in Grade 6, compare data distributions of two or more populations, and are introduced to the idea of drawing informal inferences based on data collected from random samples.

Unit 6: Geometry: Shapes, Angles, and Triangles
Module 7.3,7.4

Students extend their sixth-grade study of geometric figures and the relationships between them as they apply their work with expressions and equations to solve problems involving area of a circle and composite area in the plane, as well as volume and surface area of right prisms. In this module, students discover the most famous ratio of all, π, and begin to appreciate why it has been chosen as the symbol to represent the Grades 6–8 mathematics curriculum, *A Story of Ratios*.

Students revisit scale drawings in this unit to solve problems in which the scale factor is represented by a percent (**7.RP.A.2b**, **7.G.A.1**). They understand from their work in Module 7.1, for example, that if they have two drawings, and if Drawing 2 is a scale model of Drawing 1 under a scale factor of 80%, then Drawing 1 is also a scale model of Drawing 2, and that scale factor is determined using inverse operations. Students construct scale drawings, finding scale lengths and areas given the actual quantities and the scale factor (and vice versa); however, in this module, the scale factor is represented as a percent. Students are encouraged to develop multiple methods for making scale drawings. Students may find the multiplicative relationship between figures; they may also find a multiplicative relationship among lengths within the same figure.

Unit 7: Geometry: Measure
Module 7.6

In this unit, students delve further into several geometry topics they have been developing over the years. Grade 7 presents some of these topics (e.g., angles, area, surface area, and volume) in the most challenging form students have experienced yet. Module 6 assumes students understand the basics; the goal is to build fluency in these difficult problems. The remaining topics (i.e., working on constructing triangles and taking slices, or cross sections, of three-dimensional figures) are new to students.

Unit 8: Geometry: Transformations
Module 8.2

In this unit, students learn about translations, reflections, and rotations in the plane and, more importantly, how to use them to precisely define the concept of *congruence*. Up to this point, *congruence* has been taken to mean, intuitively, *same size and same shape*. Because this module begins with a serious study of geometry, this intuitive definition must be replaced by a precise definition. This module is a first step; its goal is to provide the needed intuitive background for the precise definitions that are introduced in this module for the first time.

Translations, reflections, and rotations are examples of *rigid motions*, which are, intuitively, rules of moving points in the plane in such a way that preserves distance. For the sake of brevity, these three rigid motions are referred to exclusively as the *basic rigid motions*. Initially, the exploration of these basic rigid motions is done via hands-on activities using an overhead projector transparency, but with the availability of geometry software, the use of technology in this learning environment is inevitable, and some general guidelines for this usage are laid out at the end of Lesson 2. What needs to be emphasized is that the importance of these basic rigid motions lies not in the fun activities they bring but in the *mathematical* purpose they serve in clarifying the meaning of congruence.

Unit 9: Exponents and Radicals
Module 8.1

In this final unit, students' knowledge of operations on numbers is expanded to include operations on numbers in integer exponents. Module 1 also builds on students' understanding from previous grades with regard to transforming expressions. Students were introduced to exponential notation in Grade 5 as they used whole number exponents to denote powers of ten (**5.NBT.A.2**). In Grade 6, students expanded the use of exponents to include bases other than ten as they wrote and evaluated exponential expressions limited to whole-number exponents (**6.EE.A.1**). Students made use of exponents again in Grade 7 as they learned formulas for the area of a circle (**7.G.B.4**) and volume (**7.G.B.6**).

21. Instructional Materials:
Eureka Math (Grade 7 and 8)

Supplementary materials
Desmos, MARS lessons, Silicon Valley Math Initiative and Illustrative Mathematics tasks

22. Instructional Methods and/or Strategies (Key Assignments)

Accelerated Math 7/8A is a fast-paced and demanding course which strives to cover significant content, develop deeper mathematical understanding, and build students' capacity for rigorous mathematical thinking. Instructional methods are built on common core -aligned best practices with a focus on student involvement in tasks that ask them to "do" math, participate in and contribute to meaning-making and reasoning.

Instructional methods will incorporate collaborative learning structures within a problem-solving framework in order to support the 3 components of rigor associated with the CA Common Core State Standards for Mathematics (conceptual understanding; procedural fluency; and application). Whole group direct instruction will be supplemented with small group instruction based on assessment data (such as STAR Math), along with incorporation of technology platforms (ex: Desmos, the graphing platform used on the Smarter Balanced Assessment) to provide individualized learning pathways for students based on their demonstrated understanding and needs.

23. Assessment Methods and/or Tools

Students will be assessed with classroom quizzes and tests, rich math tasks, and district benchmarks.

24. Grading Policy

Grading will follow the San Leandro Unified School District's policy.

Suggestions of grading are that math should be graded based on mastery of standards. In traditional grading, students are measured by the percentage of work successfully completed with the assumption that a higher completion rate reflects greater mastery. However, this does not reflect students' growth as students and in understanding over time. While we work within a traditional grading system, teachers are encouraged to incorporate precepts of a mastery based mindset into their grading policy.

Examples of ways to incorporate grading for mastery include:
- spiraling assessment
- providing a variety of methods to demonstrate understanding
- allowing students to choose between methods of demonstrating understanding
- having a later assessment, when student demonstrates understanding of more complex concepts to count more than an earlier grade
- weighing performance in the second quarter of a semester more than the work in the first quarter
- offering retakes of assessments, after a student has demonstrated work to address misunderstandings
- providing feedback on homework, classwork and participation and having these categories make a positive contribution