



# TAMALPAIS UNION HIGH SCHOOL DISTRICT

## Integrated Math I

### Overview Information

Title of Course: Integrated Mah I	
Course Author(s): Julie Norwood	Schools where the course will be taught: Redwood High School
Length of Course: 1 year	Subject Area and Discipline: Mathematics. Completion of Integrated Math I and Integrated Math II fulfills the TUHSD Algebra 1-2 and Geometry requirement.
Grade Levels: 9-10	Is this course an integrated course? Yes
Is this course being submitted for possible UC honors designation? No	Are you seeking UC approval? If so, in what area (A-G)? C
Prerequisites (required or recommended): none	Co-requisites (required or recommended): none
Check all that apply: <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> UC A-G course</li> <li><input checked="" type="checkbox"/> Graduation Requirement</li> <li><input type="checkbox"/> Elective</li> <li><input type="checkbox"/> Honors/AP</li> <li><input type="checkbox"/> ROP</li> <li><input type="checkbox"/> CTE</li> </ul>	

### Introduction to the Course

#### Course Overview:

Integrated Math I and the second course in the sequence, Integrated Math II, will be an alternative path to traditional Algebra and Geometry. This two-year sequence will fulfill the first two years of the three years of college-preparatory mathematics required by UC/CSU. Integrated Math I and Integrated Math II will fulfill the California state graduation requirement. Upon completion, students will be prepared to take a second-year Algebra course. Geometry and Algebra topics will be intertwined and connected in a meaningful way. Algebra will be spiraled throughout both years to reinforce essential skills and provide a strong foundation for success in 2nd year Algebra. The teaching methods used and the pace of instruction will be tailored to meet the student's needs.

Foundational and pre-requisite skills will be embedded in each new concept taught. The course aims to engage students in the eight mathematical practices outlined in the common core standards throughout the learning experiences. The course will focus on building the student's capacity for persistence, patience, growth mindset, and motivation through a culturally responsive curriculum using real-world problems within each unit. The course will use collaborative learning communities to provide students the opportunity to engage in mathematical tasks that involve problem-solving, communicating their reasoning, and making connections of personally relevant social contexts of mathematics.

## **The Standards for Mathematical Practice - California Common Core**

### **Mathematical Practices for all students to develop throughout this course.**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

### **Technology Course Outcomes:**

**Calculator:** Students will be able to use a calculator as needed in order to solve problems where a calculator is required. Calculator fluency will be built into units where this skill lends itself.

**Technology:** Students will use Delta math, Geometry software, Desmos and/or a graphing calculator when that technology enhances learning.

## **Integrated Math I Unit 1: Equations (including number and Quality)**

### **Unit 1 Summary:**

Order of operations and practice with the operations using integers, fractions, and decimals will be presented as a way to see structure in expressions. Students will interpret expressions that represent a quantity in terms of its context. Interpreting parts of an expression, such as terms, factors, and coefficients, will be formalized. Students will explore the ways that expressions can be written in different, comparable structures. The distributive property will be explored as scalar multiplication of a polynomial expression. Students will use these skills to solve multi-step equations focusing on the structure of an equation and the correct order of steps to accurately solve an equation. Students will choose and interpret units consistently in formulas and choose and interpret the scale and origin in graphs and data displays.

## Unit 1 Common Core Standards

- Seeing Structure in Expressions A-SSE
- Arithmetic with Polynomials and Rational Expressions A-APR
- Creating Equations A-CED
- Reasoning with Equations A-REI
- Quantities N-Q

## Unit 1 Outcomes: Students will be able to do the following

Simplify expressions, including expressions with fractions and decimals

- Identify and use order of operations
- Correctly combine “like terms” when simplifying expressions with a variety of variable and constant terms, including variables with different exponents
- Identify and use the distributive property
- Complete operations with zero, and understand that dividing by zero is not possible

Reason quantitatively and use units to solve problems.

- Understand how to scale a graph to find varying units
- Define appropriate quantities for the purpose of modeling
- Understand rounding and appropriate accuracy with reporting answers

Solve a Multi-Step Linear Equation

- Solve a two-step equation using inverse operations.
- Combine like terms to solve an equation.
- Use structure (such as distributive property) to solve a multi-step linear equation.
- Solve an equation with variables on both sides.
- Write an equation from a written statement to find a number (key words to include: sum, difference, plus, times, quotient, twice), then solve.
- Write and solve an equation to represent a real-life scenario or diagram.
- Solve absolute value equations

Solve Literal Equation

- Solve a linear equation for  $y$
- Solve formula for identified variable.

**Sample Assignment:** Students will review for their unit assessment by engaging in an activity that relies on solving problems in a scavenger hunt style activity. Each poster around the room will have a math problem to work out and solve in order to be sent to the next poster. Based on correct solutions. In the end, the students will have practiced and reviewed a sample problem aligned to the standards and skills taught in the unit that will be on the unit assessment.

**Sample Assessment:** Students will be given the opportunity to show their knowledge by solving equations of varying difficulty levels with scores based mostly on process, not on small errors. Difficulty will be scaffolded to give each student access to the content. At least one problem will include “real-life” examples where scaling and labeling answers is required.

[Sample Unit 1 Assignment](#)

[Sample Unit 1 Assessment](#)

## **Integrated Math I Unit 2: Analyze functions (Linear, quadratic, exponential)**

### **Unit 2 Summary:**

The goal of this unit is to understand how functions model relationships between two quantities and how that information can be represented in the form of an equation, a description of a relationship, or two input-output pairs (including reading these from a table). Emphasis in year 1 will be on linear equations. Other functions, such as quadratic and exponential functions will be introduced and explored fully in year 2. Students will engage in translating different representations of the same information through these various formats. For example, they may be presented with a scenario and build a linear equation to model it, or they may be presented with a table of values and create a contextual real-world situation modeled by the data. They will express the slope of a linear function as equal differences over equal intervals, and will explore scenarios that must not be linear as they do not have such relationships. They will understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.

### **Unit 2 Common Core Standards**

- Creating Equations A-CED
- Interpreting Functions F-IF
- Linear, Quadratic, and Exponential Models F-LE
- Interpreting Categorical and Quantitative Data S-ID

### **Unit 2 Outcomes: Students will be able to do the following**

#### Slope of a Line

- Find the slope of the line using the legs of a right triangle to model rise over run.
- Find the slope of the line using two points and the slope formula.
- Find the slope of the line given the linear equation in any form.
- Write a sentence describing the meaning of slope within the context of the scenario modeled by the line.
- Identify the rate of change within context when given a real-life scenario, and express the rate of change as the slope. Use appropriate units when describing the meaning the slope, x and y intercept.

#### Graphing a Linear Equation

- Use a table of values to graph a given linear equation.
- Use the x-intercept and the y-intercept to graph a given linear equation.
- Use the slope-intercept to graph a given linear equation.
- The understanding that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane will be emphasized.

#### Writing Equations of a Line in Point-Slope Form

- Use the given point and slope to write the equation of the line in point slope form.
- Write the equation of the line that passes through the given points.
- Write the equation of the line that passes through the given point and is either parallel, perpendicular, horizontal or vertical to the given line.

#### Linear, Quadratic and Exponential Models

- Distinguish between situations that can be modeled by linear, quadratic or exponential models

by understanding rate of change.

- Construct linear and exponential models (including arithmetic and geometric sequences) given a graph, situation, or table.

**Sample assignment:** Students will be given tables that have linear growth, quadratic growth and exponential growth. Students will look for the different patterns that create these types of functions. Students will be able to write the equations for linear growth and solve linear “real life” problems by writing equations, using tables and graphs.

**Sample assessment:** Assessment will be focused on linear equations. Students will be expected to graph linear equations, write equations of lines from tables and graphs, and write an equation from a situation such as: A gym membership has an initial fee of \$100 and costs an additional \$40 per month. Students will know all three forms of a line (standard, slope-intercept, and point -slope).

[Sample Unit 2 Assignment](#)

[Sample Unit 2 Assessment](#)

## **Integrated Math I Unit 3: Know and use properties of geometric figures to solve problems.**

**Unit 3 Summary:** In this unit students will get familiar with the terminology and language of geometry. They will use key skills learned in unit 1 to solve equations embedded in the context of angle relationships. This unit will also build spatial awareness through symmetry, transformations, rotations, constructions and patterns. Students will also use tools to make geometry constructions.

### **Unit 3 Common Core Standards**

- Congruence G-CO
- Expressing Geometry Properties with Equations G-GPE

### **Unit 3 Outcomes: Students will be able to do the following:**

- Learn geometry language and notation needed for fluency in geometry
- Solve equations to find missing values of angles
- Apply transformations to geometric shapes and compare transformations that change the shape vs those that don't (translations vs stretches). Transfer this knowledge into similarity and congruence.
- Identify and apply principles of symmetry and rotation to a variety of geometric figures.
- Perform basic constructions with straightedge and compass including angle bisectors, perpendicular bisectors, line parallel to a given line to a point not on a line, and shapes inscribed in a circle
- Numeric and geometric problems using patterning
- Use coordinates to prove simple geometric theorems algebraically and to compute perimeters and areas using the distance formula.

**Sample assignment:** Students will be given a variety of visual representations and asked to name angles, lines, see relationships, and look for symmetry. Algebra equations will be added to integrate unit 1 with geometry.

**Sample assessment:** Assessment will focus on the fundamentals of geometry, including proper notation and vocabulary. Students will also be assessed on symmetry, patterning and the beginnings of coordinate geometry, such as proving a quadrilateral is a rectangle by finding angles and side lengths. Students will be required to integrate their algebra knowledge with geometry by solving for unknown angles and sides using equations.

[Sample Unit 3 Assignment](#)  
[Sample Unit 3 Assessment](#)

## **Integrated Math I Unit 4: Characteristics of Functions and building functions**

**Unit 4 Summary:** Explore a variety of types of functions, including discrete and continuous. Understand that a function from one set (domain) to another set (range) assigns to each element of the domain exactly one element of the range. Understand function notation and be able to build functions in equations as well as write explicit and recursive formulas. Students will be able to identify key features from a graph and build models based on a graph, table, or situation.

### **Unit 4 Common Core Standards**

- Building Functions F-BF
- Interpreting functions F-IF
- Quantities N-Q
- Creating Equations A-CED
- Reasoning with Equations A-REI

### **Unit 4 Outcomes: Students will be able to do the following**

#### Definition of Function

- Use the given set of points to determine if the relationship represents a function by understanding that a function from one set (domain) to another set (range) assigns to each element of the domain exactly one element of the range.
- Be able to find domain and range and understand appropriate domain and range (for example discrete vs continuous) for a given graph, situation, or equation.
- Use the given graph to determine if the relationship represents a function.
- Use the table of values to determine if the relationship represents a function.
- Use the given function, to evaluate  $f(x)$  at the given values of  $x$ , using function notation.
- Interpret the function notation using a sentence when given a graph of a function with context and units.
- Understand that sequences are functions, sometimes defined recursively.
- For functions that model the relationship between two variables, interpret key features such as intercepts, minimums, maximums and where the graph is increasing and decreasing. Also discuss how end behavior is determined by the degree and leading coefficient.
- Build new functions just as  $f(x) + g(x)$  and begin recognizing even and odd functions

**Sample assignment:** The unit will begin with the definition of a function and function notation. One assignment can focus on finding  $f(x)$  and operations such as  $f(x)+g(x)$  from graphs that model real data, such as money saved in a bank, so that students understand the purpose of performing operations.

**Sample assessment:** Students will be asked to evaluate  $f(x)$  for a given value of  $x$  from an equation or from a graph. Students will be asked to define a function and will be asked to determine if a graph represents a function. Students will be assessed on finding domain and range from a graph and will be

asked to perform operations of functions on mostly linear functions, with some higher degree functions. Students will be asked to write linear relations as recursive and arithmetic sequences, understanding that sequences are discrete.

[Sample Unit 4 assignment](#)

[Sample Unit 4 assessment](#)

## Integrated Math I Unit 5: Graphing and Solving Inequalities

### Unit 5 Summary:

The goals focus on graphing linear inequalities. This unit will build on Unit 1, extending the study of linear equations and connecting ideas of “structure” to equations in different forms. Students may be presented with equations in standard form and use intercepts to create the graph. That same equation can be rearranged to slope-intercept form and graphed with that information. Students will graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality).

The unit will conclude with students solving systems linear inequalities. Contextual situations will be presented to students who will model the relationships with linear equations or inequalities and find the solution or solutions graphically. For the most complex situations, technology, such as using Desmos or a graphing calculator will be used for graphing.

### Unit 5 Common Core Standards

- Seeing Structure in Expressions A-SSE
- Reasoning with Equations and Inequalities A-REI
- Linear, Quadratic, and Exponential Models F-LE

### Unit 5 Outcomes: Students will be able to do the following

#### Graphing a Linear Inequality

- Use a table of values to graph a linear inequality.
- Use the x-intercept and the y-intercept to graph a linear inequality.
- Use the slope-intercept to graph a linear inequality.
- Use any given form of a line to graph a linear inequality (to include horizontal, vertical, and lines and non-standard forms).
- Determine if a given point is a solution to the linear inequality.
- Extend this knowledge to solving absolute value inequalities.

#### Solve the System Linear Inequalities .

- Use the method of graphing to solve a system of linear inequalities.
- Determine if a given point is a solution to the system of linear inequalities.

**Sample assignment:** Pose a situation such as: You need to earn at least \$210 per week babysitting and helping coach little kids’ soccer. You earn \$15 per hour babysitting and \$10 per hour coaching. Your parents will not let you work more than 16 hours per week. Have students set up an axis, graph the inequalities, and think about the solution set.

**Sample assessment:** Students will be asked to do a problem similar to the sample assignment. In

addition, they will be assessed on skill problems like graphing a linear inequality, solving inequalities in one variable, solving absolute value inequalities. Students will also be assessed on solving a system of linear inequalities

[Sample Unit 5 Assignment](#)

[Sample Unit 5 Assessment:](#)

## Integrated Math I Unit 6: Solving Systems Equations

### Unit 6 Summary:

Students will solve a system of linear equations graphically and algebraically. They will also show an understanding of the relevance of the point of intersection of two lines through contextual application problems. The students will have the opportunity to reason, interpret, and communicate throughout this unit with a variety of problems using real life contexts.

### Unit 6 Common Core Standards

- Creating Equations A-CED
- Reasoning with Equations and Inequalities A-REI
- Interpreting Functions F-IF
- Linear, Quadratic, and Exponential Models F-LE
- Interpreting Categorical and Quantitative Data S-ID

### Unit 6 Outcomes: Students will be able to do the following

Solve the System Equations

- Use the method of graphing to solve the system of linear equations
- Use the method of substitution to solve the system of linear equations
- Use the method of elimination to solve the system of linear equations, showing that replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions
- Use technology to graph nonlinear functions showing the the point of intersection of the graph is the solution

**Sample assignment:** Students will begin the unit with a real life situation to help them understand the idea of a system, such as one tank gaining water and one tank losing water. Students can graph both equations on the same graph and see the point of intersection. Students can discuss the meaning of the slope, x and y intercepts and point of intersection.

**Sample assessment:** Students will be tested on solving systems using graphing, substitution and elimination. Students will have at least one word problem where they have to set up equations, find the point of intersection and interrupt the solution.

[Sample Unit 6 Assignments](#)

[Sample Unit 6 Assessment:](#)

## Integrated Math I Unit 7: Ratios, Proportional Relationships, and Statistics

### Unit 7 Outcomes: Students will be able to do the following

- Convert between percent, decimal, fractions as needed within the context of a problem.

- Model a proportional reasoning problem with a proportion and solve.
- Solve a proportion.
- Collect a set of data (simulation, observation, histogram, dot-plot, other)
- Calculate the mean for a set of data.
- Find the median, median, range, and mode for a data set.
- Use socially relevant data to find measures of center (mean, median, mode) and spread (range) and write sentences in context.
- Summarize categorical data in a two - way frequency table
- Represent data on a scatter plot and find an equation of best fit
- Understand the slope of the line of best fit in context
- Use technology to find the equation of best find and interpret the meaning of the correlation

## Unit 7 Common Core Standards

- Interpreting Categorical and Quantitative Data S-ID

**Sample assignment:** 1. Students will be given data for real world data. Some should be for odd numbers of items and some for even numbers of items. Topics for data could include 9 recent exam scores or 8 lengths of sea shells. Students will find the five-number summaries and then answer the following questions.

- What is the lower extreme of the data set?
- What is the upper extreme?
- What is the median?
- What is the lower quartile?
- What is the upper quartile?

### Sample Assessment: Statistical Survey Project

This Statistical Survey Project offers students the opportunity to demonstrate their learning through the lens of a personalized statistical survey and the creation/study of a Box-And-Whisker Plot poster or digital presentation. They will propose their survey topic and box plot analysis questions before collecting their data.

Students insert themselves into their learning by selecting their own personalized survey question. This could be a topic of their choice, for example, how many hours a day students sleep.

Students will present their findings in a presentation to the class or larger audience. The project could be done individually or in small groups.

[Sample Unit 7 Assignment](#)

[Sample Unit 7 Assessment](#)

**Board Approval Date: 5.20.25**

**Updated:**

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