

# Syllabus

## Integrated Math 1B

### Course Overview

Integrated Math is a comprehensive collection of mathematical concepts designed to give you a deeper understanding of the world around you. It includes ideas from algebra, geometry, probability and statistics, and trigonometry, and teaches them as interrelated disciplines. It's likely that you've been studying some form of integrated math since elementary school.

In Integrated Math 1B, you will explore the connections between algebra and geometry. You will learn about functions and use them to solve real-world math problems. You will study data collection methods and use different types of data plots to represent and analyze statistical data. You will learn geometric theorems and rules and write proofs to support them. You will also explore congruency and similarity of triangles.

### Course Goals

This course will help you meet the following goals:

- Find the domain and range of a function.
- Relate functions with equations, tables, and graphs.
- Write exponential functions and solve problems using exponential functions.
- Write normal and recursive functions and combine different functions.
- Write rules for arithmetic and geometric series, and find sums of series.
- Transform and translate graphs of functions, and find computed functions for transformed graphs.
- Interpret the slope and intercept of a linear fit of a data set.
- Represent quantitative data using a scatter plot and fit a function to the data.
- Interpret the correlation coefficient of a data set.
- Distinguish between correlation and causation.
- Use different types of data plots to represent data.
- Understand and compare shape, center, and spread of data sets.
- Understand congruence in terms of rigid motions.
- Prove geometric theorems.
- Make geometric constructions.
- Apply geometric concepts in modeling situations.

## General Skills

To participate in this course, you should be able to do the following:

- Complete basic operations with word-processing software, such as Microsoft Word or Google Docs.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

*For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Plato Student Orientation document, found at the beginning of this course.*

## Credit Value

Integrated Math 1B is a 0.5-credit course.

## Course Materials

- Notebook
- Computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent

## Course Pacing Guide

This course description and pacing guide is intended to help you stay on schedule with your work. Note that your course instructor may modify the schedule to meet the specific needs of your class.

## Unit I: Functions

### Summary

In this unit, you will focus on writing and solving functions. You will learn about patterns and sequences and how to predict future events in a series. You will study function notation and learn how to find the domain and range of a function. You will also learn how to use exponential functions to represent and solve word problems.

Day	Activity/Objective	Type
1 day 1	<b>Syllabus and Plato Student Orientation</b> <i>Review the Plato Student Orientation and Course Syllabus at the beginning of this course.</i>	Course Orientation

2 days 2-3	<b>Patterns and Sequences</b> <i>Study different types of patterns and predict future items in these patterns.</i>	Lesson
1 day 4	<b>Function Notation</b> <i>Study and use function notation.</i>	Lesson
2 days 5-6	<b>Finding the Domain and Range of a Function</b> <i>Find the domain and range of a function.</i>	Lesson
2 days 7-8	<b>Describing Functions with Equations, Tables, and Graphs</b> <i>Study how equations, tables, and graphs can represent the same function.</i>	Lesson
2 days 9-10	<b>Exponential Growth</b> <i>Solve problems that involve exponential growth.</i>	Lesson
1 day 11	<b>Exponential Decay</b> <i>Solve problems that involve exponential decay.</i>	Lesson
3 days 12-14	<b>Unit Activity/Threaded Discussion—Unit 1</b>	Unit Activity
1 day 15	<b>Posttest—Unit 1</b>	Assessment

## Unit 2: Advanced Functions

### Summary

In this unit, you will work with more advanced functions. You will learn how to combine functions and use such combinations to represent translations and transformations of functions. You will also learn about arithmetic and geometric sequences. In the concluding part of the unit, you will learn how to write composite functions and evaluate the domain of a composite function.

Day	Activity/Objective	Type
2 days 16-17	<b>Writing and Combining Functions</b> <i>Write normal functions and recursive functions, and also combine functions, to represent situations.</i>	Lesson
1 day 18	<b>Arithmetic Sequences and Series</b> <i>Use and write sequences, arithmetic sequences, and geometric sequences.</i>	Lesson
1 day 19	<b>Geometric Sequences and Series</b> <i>Write rules for geometric sequences and find sums of geometric series.</i>	Lesson
3 days 20-22	<b>Translations and Transformations</b> <i>Alter a function by translating and transforming the graph.</i>	Lesson
2 days 23-24	<b>Functional Values</b> <i>Compute functional values by translating and transforming a function.</i>	Lesson
2 days 25-26	<b>Composite Functions</b> <i>Find composite functions, their values, and the simpler functions that make up composite functions.</i>	Lesson

2 days 27-28	<b>Domain Values of Composite Functions</b> <i>Define the restrictions on the domain of a composite function, and determine whether a value is in the domain of a composite function.</i>	Lesson
3 days 29-31	<b>Unit Activity/Threaded Discussion —Unit 2</b>	Unit Activity
1 day 32	<b>Posttest—Unit 2</b>	Assessment

## Unit 3: Inferences and Conclusions from Data

### Summary

In this unit, you will learn how to create and analyze data plots. You will analyze and represent categorical and quantitative data using different types of data plots. You will also learn how to interpret various features of data plots, including center, spread, slope, intercept, and correlation coefficient.

Day	Activity/Objective	Type
2 days 33-34	<b>Data Plots</b> <i>Represent data with plots on the real number line using dot plots, histograms, and box plots.</i>	Lesson
2 days 35-36	<b>Showing Data Center and Spread</b> <i>Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets.</i>	Lesson
2 days 37-38	<b>Interpreting the Shape of Data Distributions</b> <i>Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</i>	Lesson

2 days 39-40	<b>Relating Categorical Data</b> <i>Summarize data for two categories in two-way frequency tables and interpret their relative frequencies in the context of the data.</i>	Lesson
2 days 41-42	<b>Interpreting Data as a Line</b> <i>Interpret the slope and the intercept of a linear model in the context of the data.</i>	Lesson
2 days 43-44	<b>Relating Quantitative Data</b> <i>Represent data of two quantitative variables using a scatter plot, describe and fit a function to the data, and solve problems in the context of the data.</i>	Lesson
2 days 45-46	<b>Making and Interpreting Correlations</b> <i>Using technology, compute and interpret the correlation coefficient of a linear fit.</i>	Lesson
2 days 47-48	<b>Correlation Versus Causation</b> <i>Distinguish between correlation and causation.</i>	Lesson
3 days 49-51	<b>Unit Activity/Threaded Discussion—Unit 3</b>	Unit Activity
1 day 52	<b>Posttest—Unit 3</b>	Assessment

## Unit 4: Geometric Transformations and Congruence

### Summary

In this unit, you will focus on basic geometric definitions and transformations in a plane. You will study different types of transformations and predict the results of each one. You will then extend your learning of rigid transformations to understand the definition of congruence.

Day	Activity/Objective	Type
2 days 53-54	<b>Basic Geometric Concepts</b> <i>Know precise definitions for the concepts of angle, circle, perpendicular line, parallel line, and line segment.</i>	Lesson
2 days 55-56	<b>Representing Transformations in a Plane</b> <i>Represent transformations in a plane and compare transformations that preserve distance and angle to those that do not.</i>	Lesson
2 days 57-58	<b>Returning a Polygon to Its Original Position</b> <i>Describe the rotations and reflections that carry a given rectangle, parallelogram, trapezoid, or regular polygon onto itself.</i>	Lesson
2 days 59-60	<b>Defining Rigid Transformations</b> <i>Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</i>	Lesson
2 days 61-62	<b>Predicting Results of Rigid Transformations</b> <i>Predict the result of a rigid transformation and specify a sequence of transformations to carry a given figure onto another.</i>	Lesson
2 days 63-64	<b>Transformations and Congruence</b> <i>Use geometric descriptions of rigid motions to transform figures, and use the definition of congruence in terms of rigid motions to decide if two figures are congruent.</i>	Lesson
3 days 65-67	<b>Sides and Angles of Congruent Triangles</b> <i>Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</i>	Course Activity

3 days 68-70	<b>ASA, SAS, and SSS Criteria for Congruent Triangles</b> <i>Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</i>	Lesson
3 days: 71-73	<b>Unit Activity and Discussion—Unit 4</b>	Unit Activity
1 day: 74	<b>Posttest—Unit 4</b>	Assessment

## Unit 5: Using Geometry and Trigonometry

### Summary

In this unit, you will learn different methods for making geometric constructions, and you will use these constructions to prove theorems and solve geometric problems.

Day	Activity/Objective	Type
2 days 75-76	<b>Geometric Constructions with Lines and Angles</b> <i>Make formal geometric constructions with a variety of tools and methods.</i>	Lesson
3 days 77-79	<b>Using Coordinates to Prove Geometric Theorems</b> <i>Use coordinates to prove simple geometric theorems algebraically, including proofs involving circles.</i>	Lesson
2 days 80-81	<b>Slope Criteria for Parallel and Perpendicular Lines</b> <i>Prove the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems.</i>	Lesson
3 days 82-84	<b>Using Coordinates to Compute Perimeters and Areas</b> <i>Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.</i>	Lesson



<p>3 days 85-87</p>	<p><b>Geometric Constructions with Lines and Angles</b> <i>Make formal geometric constructions with a variety of tools and methods.</i></p>	<p>Unit Activity</p>
<p>1 day 88</p>	<p><b>Posttest—Unit 5</b></p>	<p>Assessment</p>
<p>1 day 89</p>	<p><b>Semester Review</b></p>	
<p>1 day 90</p>	<p><b>End-of-Semester Test</b></p>	<p>Assessment</p>