

**Telluride School District
High School
Mathematics**

**Course : Algebra I & II
Text and Chapter(s):**

New Concepts:

Number Sense, Properties, and Operations

1. The complex number system includes real numbers and imaginary numbers
2. Formulate, represent, and use algorithms with real numbers flexibly, accurately, and efficiently
3. Systematic counting techniques are used to describe and solve problems

Process Skills

Critical Thinking and Reasoning: Students will: argue a point; justify reasoning; evaluate for purpose; infer to predict and draw conclusions; problem solve; understand and use logic	Self-direction: Students will: understand, control, and manipulate their cognitive process	Information Literacy: Students will: Evaluate information critically and competently; accessing appropriate tools to synthesize information distinguish fact/fiction/opinion/ point of view	Invention: Students will synthesize information form multiple sources and apply new ways to solve problems their cognitive process.	Collaboration: Students will: participate in peer review; respectfully discourse; mediate opposing perspectives; understand and apply knowledge of culture; seek other's ideas	
Standard	Mathematical competency	Product of Learning	How and which process Skill(s) will emphasized within the standard	Resources	Assessment
	Understand the structure and properties of our number system. At their most basic level numbers are abstract symbols that	Show that between any two rational numbers there are an infinite number of rational numbers, and that between any two irrational numbers there are also an infinite number of irrational numbers	Self-direction: Critical Thinking and Reasoning:	Algebra 1 Number sense unit.	Number Sense test

Number Sense, Properties, and Operations	represent real-world quantities.	Express the square root of a negative number using imaginary numbers	Critical Thinking and Reasoning:	Algebra 2 Chapter 7	Algebra 2 Chapter 7 test
	Are fluent with basic numerical and symbolic facts and algorithms, are able to select and use appropriate (mental math, paper and pencil, and technology) methods based on an understanding of their efficiency, precision, and transparency	Use appropriate computation methods that encompass estimation and calculation	Collaboration:	Algebra 1 Chapter 1	
		Use technology to perform operations (addition, subtraction, multiplication, and division) on numbers written in scientific notation	Investigation	Algebra 1 Chapter 7	
		Describe factors affecting take-home pay and calculate the impact (PFL)	Investigation	Algebra 2 Chapter 1	
		Design and use a budget, including income (net take-home pay) and expenses (mortgage, car loans, and living expenses) to demonstrate how living within your means is essential for a secure financial future (PFL)	Investigation	Algebra 2 Chapter 1	
	Recognize and make sense of the many ways variability, chance, and randomness appear in a variety of contexts.	Use combinatorics (Fundamental Counting Principle, permutations, and combinations) to solve problems in real-world contexts.	Investigation	Algebra 2 Chapter 12	

**Telluride School District
High School
Mathematics**

Course : Algebra I & II
Text and Chapter(s):

New Concepts: Patterns, Functions, and Algebraic Structures

1. Functions model situations where one quantity determines another and can be represented algebraically, graphically, and using tables
2. Graphs and tables are used to describe the qualitative behavior of common types of functions
3. Parameters influence the shape of the graphs of functions
4. Expressions , equations, and inequalities can be expressed in multiple, equivalent forms
5. Solutions to equations, inequalities and systems of equations are found using a variety of tools
6. Quantitative relationships in the real world can be modeled and solved using functions

Process Skills

Critical Thinking and Reasoning: Students will: argue a point; justify reasoning; evaluate for purpose; infer to predict and draw conclusions; problem solve; understand and use logic	Self-direction: Students will: understand, control, and manipulate their cognitive process	Information Literacy: Students will: Evaluate information critically and competently; accessing appropriate tools to synthesize information distinguish fact/fiction/opinion/ point of view	Invention: Students will synthesize information form multiple sources and apply new ways to solve problems their cognitive process.	Collaboration: Students will: participate in peer review; respectfully discourse; mediate opposing perspectives; understand and apply knowledge of culture; seek other's ideas
--	--	--	---	---

Standard	Mathematical competency	Product of Learning	How and which process Skill(s) will emphasized within the standard	Resources	Assessment
Patterns, Functions, and Algebraic Structures	Make sound predictions and generalizations based on patterns and relationships that arise from numbers, shapes, symbols, and data.	a. Determine* when a relation is a function using a table, a graph, or an equation	Self Direction Collaboration	Algebra 1 Chapter 8	
		b. Demonstrate the relationship between all representations of linear functions using point-slope, slope-intercept, and standard form of a line	Investigation Collaboration	Algebra 1 Chapter 5	

		c. Represent* linear, quadratic, absolute value, power, exponential, logarithmic, rational, trigonometric (sine and cosine), and step functions in a table, graph, and equation and convert from one representation to another	Investigation Collaboration	Algebra 2 Chapter 7 Pre-calc Chapter 3	
		d. Determine the inverse (expressed graphically or in tabular form) of a function from a graph or table	Investigation Self Direction	Algebra 2 Chapter 5	
		e. Categorize sequences as arithmetic, geometric, or neither and develop formulas for the general terms related to arithmetic and geometric sequences	Self Direction	Algebra 2 Chapter 1	
		a. Evaluate* a function at a given point in its domain given an equation (including function notation), a table, and a graph	Self Direction Critical Thinking	Algebra 2 Chapter 8	
		b. Identify* the domain and range of a function given an equation (including function notation), a table, and a graph	Self Direction Critical Thinking	Algebra 1 Chapter 8	
		c. Identify* intercepts, zeros (or roots), maxima, minima, and intervals of increase and decrease, and asymptotes of a function given an equation (including function notation), a table, and a graph			

		d. Make qualitative statements about the rate of change of a function, based on its graph or table			
		a. Apply* transformations (translation, reflection, dilation) to a parent function, $f(x)$			
		b. Interpret the results of these transformations verbally, graphically, and symbolically			
	Understand that equivalence is a foundation of mathematics represented in numbers, shapes, measures, expressions, and equations.	Perform and justify steps in generating equivalent expressions by identifying properties used including the commutative, associative, inverse, identity, and distributive properties			
		Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions including those involving n th roots			
		Solve equations for one variable in terms of the others			

		Analyze various lending sources, services, and financial institutions (PFL)			
	Are fluent with basic numerical and symbolic facts and algorithms, are able to select and use appropriate (mental math, paper and pencil, and technology) methods based on an understanding of their efficiency, precision, and transparency	Find* solutions to quadratic and cubic equations and inequalities by using appropriate algebraic methods such as factoring, completing the square, graphing or using the quadratic formula			
		Find* solutions to equations involving power, exponential, rational and radical functions			
		Solve* systems of linear equations and inequalities with two variables			
	Use critical thinking to recognize problematic aspects of situations, create mathematical models, and present and defend solutions	Represent, solve*, and interpret problems in various contexts using linear, quadratic, and exponential functions			
		Represent, solve*, and interpret problems involving direct and inverse variations and a combination of direct and inverse variation			
		Analyze* the impact of interest rates on a personal financial plan (PFL)			
		Evaluate* the costs and benefits of credit (PFL)			

**Telluride School District
High School
Mathematics**

Course : AP Statistics/High School Statistics(Applied Mathematics) Text and Chapter(s): AP- The Practice of Statistics All tests, quizzes and special problems come from The Golden Resource Binder		Month: AP=Year Long, Applied Math ¼ year				
Applied Mathematics - Statistics in Action: Understanding a World of Data						
New Concepts: Data Analysis, Statistics, and Probability 1. Statistical methods take variability into account, supporting informed decision-making through quantitative studies designed to answer specific question. 2. The design of an experiment or sample survey is of critical importance to analyzing the data and drawing conclusions 3. Visual displays and summary statistics condense the information in data sets into usable knowledge 4. Randomness is the foundation for using statistics to draw conclusions when testing a claim or estimating plausible values for a population characteristic 5. Probability models outcomes for situations in which there is inherent randomness, quantifying the degree of certainty in terms of relative frequency of occurrence						
Process Skills						
Critical Thinking and Reasoning: Students will: argue a point; justify reasoning; evaluate for purpose; infer to predict and draw conclusions; problem solve; understand and use logic		Self-direction: Students will: understand, control, and manipulate their cognitive process		Information Literacy: Students will: Evaluate information critically and competently; accessing appropriate tools to synthesize information distinguish fact/fiction/opinion/ point of view	Invention: Students will synthesize information form multiple sources and apply new ways to solve problems their cognitive process.	Collaboration: Students will: participate in peer review; respectfully discourse; mediate opposing perspectives; understand and apply knowledge of culture; seek other's ideas
Standard	Mathematical competency	Product of Learning	How and which process Skill(s) will emphasized within the standard	Resources	Assessment	
Data Analysis, Statistics, and Probability	Solve problems and make decisions that depend on understanding, explaining, and quantifying the variability in data	Formulate appropriate research questions that can be answered with statistical analysis	Critical Thinking and Reasoning Information Literacy Invention	Applied Mathematics Chapter 8-12 Statistics in Action Part IV Practice of Statistics Chapters 10-14 Conclusions with Confidence	Activities 8.1, 9.1, 10.1, 11.1 Quiz after each activity Accumulative Test 8-11 Individual Chapter 10-14 Test and quizzes Chapter 10-14 accumulative test	

		Determine appropriate data collection methods to answer a research question	Self Direction Information Literacy Invention	Applied Mathematics Chapter 4 Statistics in Action Sample Surveys and Experiments Part II, Chapter 5 Practice of Statistics Producing Data	Special Problem 5B Special Problem 5B Designing Data Chapter 5 Tests, Quizzes
		Explain how data might be analyzed to provide answers to a research question	Critical Thinking and Reasoning Information Literacy	Applied Mathematics Chapter 3 Statistics in Action Relationships Between 2 Quantitative variables Part I Chapter 4 Practice of Statistics Relations in Categorical Data and Part IV, Chapter 10 Practice of Statistics Statistical Significance	Activity 3.2 Quiz Chapter 3 Activity 10.3 Inference Toolbox/Technology Chapter 10 quizzes, test Chapter 10-14 accumulative test Special problem 4a
	Communicate effective logical arguments using mathematical justification and proof. Mathematical argumentation involves making and testing conjectures, drawing valid conclusions, and justifying thinking	Identify the characteristics of a well-designed and well-conducted survey	Self Direction Information Literacy	Applied Mathematics Chapter 4.1 Statistics in Action Sample Surveys and Experiments Part II, Chapter 5.2 Practice of Statistics Designing Samples	Activity 4.1, 4.2 Quiz 4.1-4.2 Activity 5.2 Designing A Sample Chapter 5 quizzes, test
		Identify the characteristics of a well-designed and well-conducted experiment	Self Direction Information Literacy	Applied Mathematics Chapter 4.3/4 Statistics in Action Sample Surveys and Experiments Part II, Chapter 5.3 Practice of Statistics Designing an Experiment	Activity 4.3, 4.4 Test Chapter 4 Activity 5.3 Designing an Experiment Chapter 5 quizzes, test

		Differentiate between the inferences that can be drawn in experiments versus observational studies	Critical Thinking and Reasoning Self Direction Information Literacy	Applied Mathematics Chapter 4 Statistics in Action Sample Surveys and Experiments Chapter 5 Practice of Statistics, Producing Data Part IV Practice of Statistics Inference :Conclusions with Confidence	Chapter 4 Activities, Unit Test Chapter 5 investigations, Special problem 5A, chapter 5 tests and quizzes Chapter 10-14 accumulative assessment as well as individual chapter tests, quizzes
Solve problems and make decisions that depend on understanding, explaining, and quantifying the variability in data		Identify and choose appropriate ways to summarize numerical or categorical data using tables, graphical displays, and numerical summary statistics (describing shape, center and spread) and accounting for outliers when appropriate	Self Direction Information Literacy Invention	Applied Mathematics Chapters 2 Exploring Distributions Part 1 Practice of Statistics Looking for Patterns Chapter 1-4	Activity 2.1a, 2.1b, 2.2 Investigation 1.1, 1.2, 2.1, 2.2 Practice of Statistics Special Problems 1A, 2A, 3A, 4A Individual and accumulative test, quizzes for Chapter 1-4
		Define and explain how sampling distributions (developed through simulation) are used to describe the sample-to-sample variability of sample statistics	Critical Thinking and Reasoning Information Literacy	Applied Mathematics Chapters 6, 7 Statistics in Action Probability and Sampling Distributions Part III, Chapter 9 The Practice of Statistics Sampling Distributions	Investigation 7.1,7.2, 7.3 Activity 9.1, 9.2, 9.3 Special Problem 9A Chapter 9 quizzes, test
		Describe the relationship between two categorical variables using percents	Information Literacy Invention	Applied Mathematics Chapter 8 Statistics in Action Inference for Proportions Part III, Chapter 9 The Practice of Statistics Sampling Distributions	Investigation 8.1, 8.2, 8.3, 8.4 Activity 9.1, 9.2, 9.3 Special Problem 9A Chapter 9 quizzes, test

		When the relationship between two numerical variables is reasonably linear, apply* the least-squares criterion for line fitting, use Pearson's correlation coefficient as a measure of strength, and interpret the slope and y-intercept in the context of the problem	Critical thinking and Reasoning Self Direction Information Literacy Invention Collaboration	Applied Mathematics Chapter 3 Statistics in Action Relationships Between Two Quantitative Variables Chapters 3, 4 Practice of Statistics Examining Relationships and More on Two Variable data	Investigation 3.2 Chapters 3, 4 quizzes, test Chapter 1-4 accumulative test
Recognize and make sense of the many ways that variability, chance, and randomness appear in a variety of contexts		Define and explain the meaning of significance (both practical and statistical)	Critical Thinking and Reasoning Information Literacy Invention	Chapters 10.2, 10.3 Practice of Statistics	Activity 10.2 Quiz 10.2, 10.3 Chapter 10 -14 tests
		Explain the role of p-values in determining statistical significance	Critical Thinking and Reasoning Information Literacy Invention	Candy and Cards Demo Chapters 10-14 Practice of Statistics Conclusions with Confidence	Chapter 10-14 quizzes, tests Special Problems 10A, 11A, 12B, 13A
		Determine the margin of error associated with an estimate of a population characteristic	Critical Thinking and Reasoning Information Literacy Invention	Chapter 10.1, 10.2 Practice of Statistics Estimating with Confidence	Investigation 10.1 Estimating with Confidence Quiz 10.1, Chapter 10-14 quizzes, tests
Recognize and make sense of the many ways that variability, chance, and randomness appear in a variety of contexts		Develop* simulations that demonstrate probability as a long-run relative frequency	Information Literacy Invention	Chapter 5 Statistics in Action Probability Models Chapter 6 Practice of Statistics Probability: The study of randomness	Activity 5.1, 5.3 Long run activity Chapter 6 Practice of Statistics Special Problem 6C Chapter 6 Quizzes, Test
		Apply and solve problems using the concepts of independence and conditional probability	Critical Thinking and Reasoning Invention	Chapter 5.4 Statistics in Action Conditional Probability Chapter 6.2, 6.3 Statistics in Action Probability Models and Rules	Conditional Probability and Venn Diagrams Investigation Practice of Statistics Special Problem 6C

					Chapter 6 Quizzes, Test
		Apply and solve problems using the concept of mutually exclusive properties when combining probabilities	Critical Thinking and Reasoning Invention	Chapter 5.3 Statistics in Action The Addition rule and Disjoint events Chapter 6.2 Practice of Statistics	Investigation 5.3 Practice of Statistics Special Problem 6C Chapter 6 Quizzes, Test
		Evaluate* and interpret probabilities using a normal distribution	Critical Thinking and Reasoning Invention	Chapters 2, 6, 7, 8 Practice of Statistics	Normal Distribution Graphs Special Problem 2A Practice of Statistics Special Problem 6C Chapters 6-9 Quizzes, Test
		Find* and interpret the expected value and standard deviation of a discrete random variable X	Critical Thinking and Reasoning Invention	Chapter 7 Practice of Statistics Random Variables	Chapter 7 Quiz, Test
		Analyze* the cost of insurance as a method to offset the risk of a situation (PFL)	Critical Thinking and Reasoning Invention	Working on this one	Working on this one