

Quantitative Literacy

Course Description and Standards

A required course for high school graduation

Course Description

Quantitative Literacy will prepare students to enter the work force or to attend college with an understanding of the mathematics in the real world.

The course will help students develop quantitative literacy as a habit of mind and an approach to problems that employs and enhances both statistics and mathematics.

The main goal of the course is for students to see that mathematics is a powerful tool for living, as they develop:

- *Confidence with Mathematics.* Students will become comfortable with quantitative ideas and proficient in applying them. Students will routinely quantify, interpret, and check information.
- *Cultural Appreciation.* Students will be able to understand the nature of mathematics and its importance for comprehending issues in the public realm.
- *Logical Thinking.* Students will develop habits of inquiry, looking for appropriate information, analyzing and reasoning real world issues.
- *Making Decisions.* Students will develop the habit of using mathematics to make decisions in everyday life. Students will see that mathematics is a powerful tool for living.

Standards

Ratios and Proportions	
Students will be able to:	
RP 1	Understand and find a percent of a number
RP 2	Determine what percent one number is of another
RP 3	Use percent to represent change
RP 4	Find the unit price of an item
RP 5	Compare unit prices of two or more items
RP 6	Determine the annual cost of an item
RP 7	Determine the markup of an item
RP 8	Determine the discount of an item
RP 9	Determine the price of an item after multiple discounts
RP 10	Determine the sales tax on an item
RP 11	Determine the excise tax on an item
RP 12	Determine the value-added tax on an item

Set Notation	
Students will be able to:	
SN 1	Use Venn diagrams to visualize the union and intersection of sets
SN 2	Use the union of two sets to represent <i>or</i>
SN 3	Use an intersection of two sets to represent <i>and</i>
SN 4	Use the complement of a set to represent <i>not</i>

Logic	
Students will be able to:	
LG 1	Use deductive reasoning
LG 2	Use inductive reasoning
LG 3	Recognize deductive fallacies in tables and advertisements

Algebra	
Students will be able to:	
AL 1	Use scientific notation to write large and small numbers
AG 2	Use unit analysis to “balance” both sides of a formula
AG 3	Find and illustrate exponential growth using graphs, tables and exponential growth rates.
AG 4	Find and illustrate exponential decay using graphs, tables and an exponential decay rate.
AG 5	Calculate and use half-life
AG 6	Recognize and describe different patterns, including: linear, exponential quadratic and Fibonacci patterns.
AG 7	Use and compare different patterns to predict a future event, including linear, exponential and quadratic patterns.
AG 8	Recognize a proportional pattern

AG 9	Compare exponential and logistic growth
AG 10	Compare linear, quadratic, and exponential growth

Geometry	
Students will be able to:	
GM 1	Find the area of geometric figures using formulas
GM 2	Convert measures within a given number system
GM 3	Convert measures between different systems of measure

Statistics and Probability	
Students will be able to:	
SP 1	Use probability to describe the likelihood of an event
SP 2	Analyze the likelihood of a risk
SP 3	Use likelihood to describe actuarial data
SP 4	Find and compare theoretical and experimental probability
SP 5	Estimate a probability using historical events
SP 6	Find an expected value involving two or more events
SP 7	Use expected value to make investment decisions
SP 8	Find the probability of independent events
SP 9	Find the probability that an event does not occur
SP 10	Find counterintuitive probabilities
SP 11	Use different types of graphs to represent data including: stacked area graphs, radar graphs, scatter plots, stream graphs, and candlestick charts
SP 12	Use measures of central tendency to describe and analyze data, including mean, median and mode; box-and-whisker plots; standard deviation
SP 13	Compare different types of distributions
SP 14	Use sample populations to predict outcomes

Applications	
Students will be able to:	
APP 1	Create and balance a monthly budget
APP 2	Write checks and balance a checkbook
APP 3	Analyze a budget
APP 4	Analyze and calculate the cost of loans and credit, including: being able to read and understand a promissory note, determine the annual percentage rate for a loan, create an amortization table, analyze the cost of buying on credit, and analyze credit in the United States
APP 5	Compare the costs of buying a home versus renting, including: comparing rates and terms for a mortgage and the effect of principal payments

APP 6	Analyze different types of savings accounts to determine what is best for you, including a savings account, an increasing annuity and a decreasing annuity
APP 7	Use the consumer price index to describe the change in prices for consumer goods over time
APP 8	Interpret a consumer price index using a graph
APP 9	Compare inflation to the value of the dollar
APP 10	Use straight-line depreciation
APP 11	Use double declining-balance depreciation
APP 12	Use sum of years-digits depreciation
APP 13	Calculate, identify and analyze different types of taxes, including: flat income tax, indirect tax, graduated income tax, property tax, Social Security tax, and Medicare taxes
APP 14	Evaluate the benefit and viability of Social Security
APP 15	Use data to analyze a person/s weight, height, heart rate and cardiovascular health
APP 16	Use data collection to analyze sports outcomes such as Winter and Summer Olympic events, baseball and football
APP 17	Analyze personal sporting events to determine energy usage