New York Mills High School

Curriculum Document

Curriculum Area: Math

Course Name: Introduction to Statistics

Common Course Catalog Number: 246

Length of Course: 1 Semester

Pre-Requisite: Algebra II

Grade Level: 10

Course Description: This course is designed to enable students to grasp important concepts in statistics. Daily work will consist or measures of central tendencies, variations, histograms, frequency distributions, normal distributions, and standard deviation. This course will bring in examples from common everyday life. Nearly all types of careers outside of High School and College will be represented.

Essential Learner Outcomes (5 to 7)

* Student will know how to use functions technology to organize and calculate very complex formulas.
* Students will know how to make predictions from what seems to be obscure data.
* Students will know how to read and interpret many forms of graphs, charts, and tables.
* Students will know how to use elementary probability to solve real-life problems.
* Students will know how to use statistics and probability to make good everyday life decisions.

Units of Study:

Unit 1- Students will explain the impact of: sampling methods, bias questions, phrasing of questions asked during data collection. Students will use random numbers generated by a

calculator or a spreadsheet, or taken from a table, to perform probability simulations and use them to introduce fairness into decision making.

Unit 2- Students will evaluate reports based on data published in the media by: Identifying the source of the data, design of the study, the way the data are analyzed and the way the data are displayed. Students will show how graphs can be distorted to support different points of view and can be distorted to support different points of view. Students will know how to use spreadsheet, tables, graphs or graphing technology to recognize and analyze distortions in data displays. Students will identify and explain misleading uses of data. Students will recognize when arguments based on data confuse correlation and causation.

Unit 3-Students will describe and compare data sets using location and spread-inter-quartile range (IQR). Students will know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics. Students will analyze the effects on mean, median, quartiles, percentiles when there are changes in the data sets. Students will describe a data set using a box-and-whisker plot. Students will describe and compare data sets using summary statistics- mean, median, quartiles, percentiles, standard deviations, and range.

Unit 4- Students will use scatterplots to analyze and describe patterns between two variables. Students will use technology to calculate the line of regression also known as the line of best fit and use technology to calculate the correlation coefficients. Students will use the line of regression to make predictions and use the correlation coefficients to assess the reliability of these predictions.

Unit 5- Students will select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities. Students will understand that the Law of Large Numbers expresses a relationship between the probabilities in a probability model and the experimental probabilities found by performing simulations or experiments involving the model. Use random numbers generated by a calculator or a spreadsheet, or taken from a table, to perform probability simulations and to introduce fairness into decision making. Students will apply probability concepts such as intersections, unions and complements of events, and conditional probability and independence, to calculate probabilities and solve problems. Students will describe the concepts of intersections, unions and complements using Venn diagrams. Understand the relationships between these concepts and the words AND, OR, NOT, as used in computerized searches and spreadsheets. Understand and use simple probability formulas involving intersections, unions and complements of events. Students will apply probability concepts to real-world situations to make informed decisions.

Unit 6- Student will use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve) and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets and tables to estimate areas under the normal curve.