

**MASCONOMET REGIONAL SCHOOL DISTRICT  
CURRICULUM GUIDE**

<b>COURSE NAME:</b>	<u>Data Analysis Lab</u>	<b>DEPARTMENT:</b>	<u>Mathematics</u>
<b>COURSE NUMBER:</b>	<u>1084</u>	<b>GRADE LEVEL(S):</b>	<u>8</u>
<b>PHASE:</b>	<u>N / A</u>	<b>YEAR:</b>	<u>TRIMESTER X (half)</u>

**I. Course Description:**

This course will provide students with an opportunity to investigate the concepts and skills related to Data Analysis, Statistics and Probability as delineated in the Massachusetts Curriculum Frameworks in Mathematics (c. 2011).

Students will learn how to select, create, interpret and utilize various tabular and graphical representations for data including: circle graphs, Venn diagrams, scatter plots, stem and leaf plots, box plots, histograms, tables and charts. They will be able to distinguish between continuous and discrete data and the ways to represent each.

Students will be able to find, describe and interpret measures of central tendency and the range for a given set of data. Students will be able to create and use tree diagrams, tables, organized lists and area models to compute probabilities for simple compound events.

**II. Purpose:**

Students are responsible for this content on the grade 8 MCAS test. Because the core program in mathematics in the middle school is algebra, there is not enough time in that program to cover this content in sufficient detail.

Students should use this as they prepare for the MCAS mathematics test in grade 8.

Students are also expected to keep this as a review tool for work in Data Analysis that will be part of their high school mathematics program.

**III. Curriculum Frameworks Standards for Mathematical Practice:**

The primary goal of school mathematics programs is to assist students in becoming mathematically proficient. Mathematically proficient students are able to:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.

## Grade 8 Data Analysis Lab

- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

### IV. Curriculum Frameworks Standards for Mathematical Content:

Statistics and Probability:

Students will:

- Understand that statistics can be used to gain information about a population by examining a sample of the population.
- Understand that generalizations about a population from a sample are valid only if the sample is representation of that population.
- Understand that random sampling tends to produce representative samples and support valid inferences.
- Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.
- Generate multiple samples of the same size to gauge the variation in estimates or predictions.
- Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
- Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
- Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring and the larger the number the greater the likelihood.
- Approximate the probability of a chance event by collecting data on the chance process that produces it and observing long run relative frequency.
- Predict the approximate relative frequency given the probability.
- Develop a probability model and use it to find the probabilities of events.
- Compare probabilities from a model to observed frequencies.
- Explain possible sources of the discrepancy if the model and observed frequencies do not agree.
- Find probabilities of compound events using organized lists, tables, tree diagrams and simulation.
- Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities.
- Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.
- Know that straight lines are widely used to model relationships between two quantitative variables.
- Informally fit a straight line to scatter plots that suggest a linear association.

## Grade 8 Data Analysis Lab

- Informally assess the model fit by judging the closeness of the data points to the line.
- Use the equation of a linear model to solve problems.
- Interpret the slope and intercept of a linear model in the context of bivariate measurement.
- Construct and interpret a two way table summarizing data on two categorical variables collected from the same subjects.
- Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

### V. **Scope and Sequence:**

Unit A:

Sampling

Students will be able to:

- Define population and sample
- Differentiate between population and sample
- Classify samples as random, convenience or biased
- Distinguish between sample size and population size
- Determine effective ways to collect data
- Develop survey instruments

Unit B:

Measures of Central Tendency

Students will be able to:

- Calculate the mean, median and mode for a data set
- Interpret the mean, median and mode for a data set
- Determine the impact of changes in the data considered to the mean, median and mode of a data set

Unit C:

Understanding Data

Students will be able to:

- Distinguish between continuous and discrete data
- Determine appropriate ways to represent continuous and discrete data
- Define the range for a data set
- Determine the range for a data set
- Interpret the range for a data set

Unit D:

Representing Data

Students will be able to:

- Determine the most effective way to display a data set
- Create circles graphs to represent data sets

## Grade 8 Data Analysis Lab

- Interpret circle graphs with respect to the data set they represent
- Create tables and charts to represent data sets
- Interpret tables and charts with respect to the data set they represent
- Create Venn diagrams to represent data sets
- Interpret Venn diagrams with respect to the data set they represent
- Create scatter plots to represent data sets
- Interpret scatter plots with respect to the data set they represent
- Create stem and leaf plots to represent data sets
- Interpret stem and leaf plots with respect to the data set they represent
- Create histograms to represent data sets
- Interpret histograms with respect to the data set they represent

### Unit E:

#### Probability

Students will be able to:

- Define event, outcome, probability of an event, certain event, impossible event
- Calculate probabilities for simple events
- Represent probabilities as fractions, decimals and percents
- Calculate geometric probabilities
- Represent compound probabilities via tree diagrams or tables
- Distinguish compound probabilities that represent intersections of two or more events from those representing unions of two or more events from those representing independent events
- Determine when two or more events are mutually exclusive
- Determine probabilities for the intersection of two or more events, the union of two or more events, compound events with replacement and compound events without replacement
- Apply the fundamental counting principle to determine the number of possible outcomes
- Apply permutations to determine the number of possible outcomes

Revised 08/11