

Unit 1: Introduction to Statistics

Content Area:	Math
Course(s):	Generic Course, PROB & STAT
Time Period:	Marking Period 1
Length:	3 weeks
Status:	Published

Standards

Math Standards

MA.S-IC.A.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
MA.S-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
MA.S-IC.B.6	Evaluate reports based on data.

Life Literacies and Key Skills

TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

Transfer Goals

Transfer Goals

- Statistics is a science of collecting, organizing, analyzing, and interpreting data in order to make decisions.

Concepts

Essential Questions

- What is Statistics?
- How do descriptive statistics and inferential statistics differ?

Understandings

- The study of statistics has two major branches: descriptive statistics and inferential statistics.
- Descriptive statistics is the branch of statistics that involves the organization, summarization, and display of data.
- Inferential statistics is the branch of statistics that involves using a sample to draw conclusions about a population.

Critical Knowledge and Skills

Knowledge

Students will know:

- Statistics
- Descriptive Statistics
- Inferential Statistics
- Population
- Sample
- Parameter
- Statistic
- Simple Random Sample
- Stratified Sample
- Cluster Sample
- Systematic Sample
- Census
- Sampling
- Biased Sample
- Sampling Error
- Observational Study
- Experiment
- Simulation
- Survey
- Confounding Variable

Skills

Students will be able to:

- Distinguish between a population and a sample.
- Distinguish between a parameter and statistic.
- Distinguish between descriptive statistics and inferential statistics.
- Design a statistical study.
- Collect data by doing an observational study, performing an experiment, using a simulation, or a survey.
- Create a sample using random sampling, simple random sampling, stratified sampling, cluster sampling, and systematic sampling.
- Identify a biased sample.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Small Group Work
- Whole Class Discussions
- Application Questions
- Reflections
- Homework
- Quizzes

School Summative Assessment Plan

Introduction to Statistics Unit Test: Students will be assessed on their ability to identify and use statistical vocabulary. This assessment will be composed of low-level demand tasks which consist of questions pertaining to vocabulary and high-level demand tasks which consist of analyzing statistical studies.

Primary Resources

Elementary Statistics: Picturing the World (4th Edition) by Ron Larson and Betsy Farber

Supplementary Resources

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- Stat Medic (<https://www.statsmedic.com>)
- IXL (<https://www.ixl.com>)
- Desmos Classroom (<https://teacher.desmos.com>)

Technology Integration and Differentiated Instruction

Technology Integration

- **Google Products**
 - Google Classroom - Used for daily interactions with the students covering a vast majority of different educational resources (Daily Notes, Exit Tickets, Classroom Polls, Quick Checks, Additional Resources/ Support, Homework, etc.)
 - GAFE (Google Apps For Education) - Using various programs connected with Google to collaborate within the district, co-teachers, grade level partner teacher, and with students to stay connected with the content that is covered within the topic. Used to collect data in real time and see results upon completion of the assignments to allow for 21st century learning.
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- **One to One Student's laptop**
 - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the Gifted Students are to be given the Extending Concepts Questions.
- These questions are to push the knowledge of each portion of the lesson. Extending Concepts Questions are located in the textbook at the end of each section's exercises.

English Language Learners (N.J.A.C.6A:15)

- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Encourage student to seek extra help.
- Work with Guidance Counselor and I&RS Team to create an intervention plan.

Special Education Students (N.J.A.C.6A:8-3.1)

- Allow for extra time (if needed)
- Hard copy of notes
- Chunking of problems
- Preferential seating
- Work with contact teacher to assist with additional accommodations noted in IEP/504 plans.

Interdisciplinary Connections

MATH -

ELA - Students justify reasoning through oral and written communication.

SCIENCE - Students analyze a study pertaining to oral vs visual memorization.

SOCIAL STUDIES - Students analyze the ages of U.S. Presidents at inauguration. Students analyze a study determining children's reactions to be given a cookie and their ability to wait for an additional cookie. Students analyze a study determining people's reactions when an elevator shames people for taking the elevator rather than the stairs.

WORLD LANGUAGES -

VISUAL/PERFORMING ARTS -

APPLIED TECHNOLOGY/BUSINESS - Students create random samples using online random generators.

GLOBAL AWARENESS - Students analyze a study pertaining to what a group of college students learned from an experiment on privilege.

Learning Plan / Pacing Guide

Week 1

- Statistical Study - Does Beyonce Write Her Own Lyrics: Students use the data analysis process to determine if there is good evidence that Beyonce did not write the lyrics for "Crazy in Love." This study introduces students to the science of Statistics. Students are introduced to the vocabulary Statistics, Descriptive Statistics, and Inferential Statistics using this study.
- Population vs Sample Card Sort: Students are introduced to the vocabulary population and sample and then

work with a partner to sort pictures into two categories: population and sample. After sorting the cards correctly, students explain their strategy for determining if a picture represents a population or sample.

- Parameter vs Statistic Card Sort: Students work with a partner to determine whether statements are about a population or sample. After sorting the cards correctly, students explain their strategy for determining if a statement is about a population or sample. Students are introduced to the vocabulary parameter and statistic through this activity.
- Unit 1 Lesson 1 - 3 Review
- Unit 1 Lesson 1 - 3 Quiz

Week 2:

- Statistical Study - Average Age of Presidents at Inauguration: Students gather data using the various sampling methods to determine the average age of a president at their first inauguration. Through this activity, students review the data analysis process and are introduced to the vocabulary simple random sample, stratified sample, cluster sample, systematic sample, sampling, census, biased sample, and sampling error.
- Statistical Study - How Do You Remember?: Students will be given two lists of numbers to remember. For the first list, students will be given time to read the numbers before being asked to determine how many numbers they remember. For the second list, students will be read the numbers before being asked to determine how many numbers they remember. Using the data analysis process, students determine whether our class remembers better when they see or hear numbers.
- Other Types of Studies: Students will watch videos of other studies. Through this activity, students are introduced to the vocabulary experiment, observational study, simulation, and survey.

Week 3:

- Appropriate Conclusions Exploration: Students analyze an observational study that tests the effect of caffeine on a heart rate. First, they identify problems with the plan, then determine solutions to each problem, and finally redesign the observational study into an experiment. Through this exploration, the concept of appropriate conclusions and confounding variables are introduced.
- Unit 1 Review
- Unit 1 Test

Unit 2: Descriptive Statistics

Content Area:	Math
Course(s):	Generic Course, PROB & STAT
Time Period:	Marking Period 1
Length:	7 weeks
Status:	Published

Standards

Math Standards

MA.S-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
MA.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
MA.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
MA.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Life Literacies and Key Skills

TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.TL.2	Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data.
TECH.9.4.12.IML.3	Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8).

Transfer Goals

Transfer Goals

- Descriptive statistics consists of graphical and numeric methods to organize and summarize data.

Concepts

Essential Questions

- What is descriptive statistics and how is it useful when studying data?
- How does descriptive statistics affect inferential statistics?

Understandings

- Descriptive statistics is the branch of statistics that involves the organization, summarization, and display of data.
- Descriptive statistics is useful when making inferences about the population.

Critical Knowledge and Skills

Knowledge

Students will know:

- Variables
- Data
- Qualitative Variables
- Quantitative Variables
- Discrete Variable
- Continuous Variable
- Frequency Distribution for Qualitative Data
- Frequency
- Relative Frequency
- Relative Frequency Distribution
- Bar Chart
- Pie Chart
- Dot Plot
- Stem-and-Leaf Plot
- Split Stem-and-Leaf Plot
- Frequency Distribution for Quantitative Data
- Histogram
- Classes
- Lower Class Limit
- Upper Class Limit
- Class Width
- Frequency Polygon
- Midpoint

- Relative Frequency Polygon
- Ogive
- Cumulative Frequency
- Measures of Central Tendency (Mean, Median, Mode)
- Outlier
- Shapes of Distributions (Symmetric, Uniform, Skewed Left, Skewed Right)
- Measures of Variation (Range, Standard Deviation, Interquartile Range)
- Quartiles
- Five Number Summary
- Box-and-Whisker Plot

Skills

Students will be able to:

- Distinguish between qualitative data and quantitative data.
- Classify quantitative variable as discrete or continuous.
- Construct a frequency distribution for qualitative data including frequencies and relative frequencies.
- Graph qualitative data sets using pie charts and bar charts.
- Graph quantitative data sets using exploratory data analysis tools of stem-and-leaf plots and dot plots.
- Construct a frequency distribution for quantitative data including classes, frequencies, midpoints, relative frequencies, cumulative frequencies.
- Construct histograms, frequency polygons, relative frequency polygons, and ogives.
- Find the mean, median, and mode of a population and a sample.
- Describe the shape of a distribution as symmetric, uniform, or skewed and how to compare the mean and median for each.
- Find the range and of a data set.
- Find the standard deviation of a population and a sample.
- Find the quartiles and interquartile range of a data set.
- Construct a box plot.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Small Group Work
- Whole Class Discussions
- Application Questions
- Reflections
- Homework
- Quizzes

School Summative Assessment Plan

Descriptive Statistics Unit Test: Students will be assessed on their ability to use descriptive statistics techniques to analyze data. This assessment will be composed of low-level demand tasks which consist of questions pertaining to identifying descriptive statistics and high-level demand tasks which consist of analyzing data.

Primary Resources

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Technology Integration

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Differentiated Instruction

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English Language Learners (N.J.A.C.6A:15)

- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Encourage student to seek extra help.
- Work with Guidance Counselor and I&RS Team to create an intervention plan.

Special Education Students (N.J.A.C.6A:8-3.1)

- Allow for extra time (if needed)
- Hard copy of notes
- Chunking of problems
- Preferential seating
- Work with contact teacher to assist with additional accommodations noted in IEP/504 plans.

Interdisciplinary Connections

MATH -

ELA - Students justify reasoning through oral and written communication.

SCIENCE - Students use digital scales to measure and analyze weights of fun size bags of Skittles.

SOCIAL STUDIES - Students analyze the ages of the first 45 U.S. Presidents. Students analyze a study pertaining to the population of West Deptford.

WORLD LANGUAGES -

VISUAL/PERFORMING ARTS - Students analyze a study pertaining to movie watching.

HEALTH/PHYSICAL EDUCATION - Students analyze a study pertaining to standing on one foot with eyes closed.

APPLIED TECHNOLOGY/BUSINESS - Students use Google Sheets to create and display descriptive statistics. Students analyze a study pertaining to the use of social media. Students analyze a study pertaining to the use of text messages.

GLOBAL AWARENESS -

Learning Plan / Pacing Guide

Week 1:

- **Statistical Study - Standing on One Foot:** Students will be asked to stand on one foot with their eyes closed. Then share with the class which foot they decided to balance on and how long they were able to balance in seconds. Then students will compare and contrast the data collected. Using this feedback, students are introduced to the vocabulary variable of interest, data, qualitative variable, quantitative variable, discrete quantitative variable, and continuous quantitative variable.
- **M&M Data Analysis:** Students organize and analyze colors of M&Ms. Through this activity, students are introduced to the frequency, frequency distribution for qualitative data, relative frequency, and relative frequency distribution for qualitative data.
- **Social Media App Data Analysis:** Students make a hypothesis of the favorite social media app for the class, then collect and organize data. Through this activity, students learn to organize data on google sheets using a bar chart and pie chart.
- **Movie Data Analysis:** Students collect, organize, and analyze data on the number of movies students watched last month. Through this activity, students learn to organize data using dot plots.
- **Pairs of Shoes Data Analysis:** Students collect, organize, and analyze data on the number of shoes students own. Through this activity, students learn to organize data using a stem-and-leaf plot.

Week 2:

- **Skittles Data Analysis:** Students weigh fun size bags of Skittles and then organize data. Through this activity, students are introduced to split stem-and-leaf plots and the importance of using a key.
- **Unit 6 Lesson 1 - 6 Review**
- **Unit 6 Lesson 1 - 6 Quiz**

Week 3:

- **Statistical Study - How Many Text Messages Do You Send a Day?:** Students determine how many text messages they send in a day and then students will organize the data. Through this activity students are introduced to frequency distribution for quantitative data, histograms, and learn how to create histograms using google sheets.
- **Unit 2 Lesson 7 - 8 Review**
- **Unit 2 Lesson 7 - 8 Quiz**

Week 4:

- **Pairs of Shoes Data Analysis Revisited:** Using pairs of shoes data, students are introduced to frequency polygons, midpoints, and learn how to create frequency polygons using google sheets.
- **Driving Data Analysis:** Students identify number of minutes it takes them to get to school and organize the data. Through this activity, students are introduced to relative frequency polygons and ogives.
- **Unit 2 Lesson 7 - 11 Review**

- Unit 2 Lesson 7 - 11 Quiz

Week 5:

- Do You Have Pets Exploration: Students calculate the measures of center for three samples and discover what is an outlier. In addition, students determine how measures of center are effected by an outlier.
- Appropriate Measure of Center (Think, Pair, Share): Students identify outliers and determine whether the mean or median would be a more appropriate measurement. Through this activity, students will be introduced to the shapes of distributions and the appropriate measure of center for each shape. Students also learn how to use a calculator to find the measures of center.
- Sample Comparisons: Students compare and contrast samples. Through this activity, students determine the importance of measures of variation and students are introduced to the range, deviation, and standard deviation. Students also learn how to use a calculator to find the measures of variation.

Week 6:

- Unit 2 Lesson 12 - 15 Review
- Unit 2 Lesson 12 - 15 Quiz
- Statistical Study - Do You Know West Deptford?: Students guess the population of West Deptford and analyze their guesses. Through this activity, students are introduced to quartiles, interquartile range, five number summary, and box-and-whisker plots.

Week 7:

- Unit 2 Review
- Unit 2 Test

Unit 3: Probability

Content Area: **Math**
Course(s): **Generic Course, PROB & STAT**
Time Period: **Marking Period 2**
Length: **4 weeks**
Status: **Published**

Standards

Math Standards

MA.S-CP.A.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
MA.S-CP.A.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
MA.S-CP.A.3	Understand the conditional probability of A given B as $\frac{P(A \text{ and } B)}{P(B)}$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A , and the conditional probability of B given A is the same as the probability of B .
MA.S-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.
MA.S-CP.A.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
MA.S-CP.B.6	Find the conditional probability of A given B as the fraction of B 's outcomes that also belong to A , and interpret the answer in terms of the model.
MA.S-CP.B.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.
MA.S-CP.B.8	Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = [P(A)] \times [P(B A)] = [P(B)] \times [P(A B)]$, and interpret the answer in terms of the model.

Life Literacies and Key Skills

TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

Transfer Goals

Transfer Goals

- Probability is used to make predictions about events.

Concepts

Essential Questions

- How can we determine the number of outcomes for an event?
- How can we determine the probability of an event occurring?

Understandings

- Probability is the chance an event occurs.
- The differences between the Counting Principals, Multiplication Rule, and Addition Rule.

Critical Knowledge and Skills

Knowledge

Students will know:

- Probability Experiment
- Outcome
- Sample Space
- Tree Diagram
- Fundamental Counting Principal
- Event
- Simple Event
- Complement of Event
- Classical Probability
- Empirical Probability
- Subjective Probability
- Law of Large Numbers
- Conditional Probability
- Independent Events
- Dependent Events
- Mutually Exclusive Events

- Addition Rule
- Multiplication Rule

Skills

Students will be able to:

- Identify the Sample Space of a probability experiment and to identify simple events.
- Use the Fundamental Counting Principle to find the number of ways two or more events can occur.
- Distinguish among classical probability, empirical probability, and subjective probability.
- Find the probability of the complement of an event and how to find other probabilities using tree diagrams and the Fundamental Counting Principal.
- Find conditional probabilities.
- Distinguish between independent and dependent events.
- Determine if two events are mutually exclusive.
- Use the Additional Rule to find the probability of two events.
- Use the Multiplication Rule to find the probability of two events occurring in sequence.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Small Group Work
- Whole Class Discussions
- Application Questions
- Reflections
- Homework
- Quizzes

School Summative Assessment Pan

Probability Unit Test: Students will be required to create a sample space and determine specific outcomes for an event. They will then complete classical and empirical probability problems that require the use of basic probability, conditional probability, multiplication rule, and addition rule.

Primary Resources

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Special Education Students (N.J.A.C.6A:8-3.1)

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- Chunking of problems
- Preferential seating
- Work with contact teacher to assist with additional accommodations noted in IEP/504 plans.

Interdisciplinary Connections

MATH -

ELA - Students justify reasoning through oral and written communication.

SCIENCE - Students use probability to analyze genetics and blood types.

SOCIAL STUDIES - Students use probability to analyze the ages of Americans.

WORLD LANGUAGES -

VISUAL/PERFORMING ARTS -

APPLIED TECHNOLOGY/BUSINESS - Students use the fundamental counting principal and sample space to analyze car sales, security codes, and license plates. Students use probability to analyze worker's income.

GLOBAL AWARENESS -

Learning Plan / Pacing Guide

Week 1:

- Rock, Paper, Scissors: Students play and analyze the game: rock, paper, scissors. Through this activity, students are introduced to the vocabulary probability experiment, outcome, sample space, tree diagram, event, simple event, Fundamental Counting Principle, types of probability, and the Law of Large Numbers.
- Unit 3 Lesson 1 - 2 Review
- Unit 3 Lesson 1 - 3 Quiz

Week 2:

- Introduction to Conditional Probability with Playing Cards: Students find the probability of selecting playing cards from a standard deck. Through this activity, students are introduced to conditional probability and independent versus dependent events. Students then apply their knowledge of conditional probability in order to determine the probability of events using a two-way frequency table.
- Introduction to the Addition Rule using Playing Cards: Students find the probability of selecting playing cards from a standard deck. Through this activity, students are introduced to the addition rule and mutually exclusive. Students then apply their knowledge of the additional rule in order to determine the probability of events using a two-way frequency table.

Week 3:

- Unit 3 Lesson 2 and 3 Review
- Unit 3 Lesson 2 and 3 Quiz
- The Multiplication Rule - Theoretical Probability: Students investigate a deck of cards and determine the probability of events. Through this activity, students determine that you use the multiplication rule to find the probability of multiple events.

Week 4:

- Unit 3 Review
- Unit 3 Test

Unit 4: Probability Distributions

Content Area: **Math**
Course(s): **Generic Course, PROB & STAT**
Time Period: **Marking Period 2**
Length: **3 weeks**
Status: **Published**

Standards

Math Standards

MA.S-ID.A.4	Use the mean and standard deviation of a data set to fit it to a normal distribution 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.
MA.S-MD.A.1	Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
MA.S-MD.A.2	Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
MA.S-MD.A.3	Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value.
MA.S-MD.A.4	Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value.
MA.S-MD.B.5a	Find the expected payoff for a game of chance.

Life Literacies and Key Skills

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TECH.9.4.12.IML.3	Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8).

Transfer Goals

Transfer Goals

- Probability distribution is the probability of every possible event occurring.

Concepts

Essential Questions

- How can we interpret a probability distribution?
- When should we use a discrete distribution versus a continuous distribution?

Understandings

- A probability distribution is every possible value the random variable can assume, together with its probability.
- Discrete probability distributions are for finite or countable possible outcomes.
- Continuous probability distributions are for infinite or uncountable possible outcomes, represented by the normal curve.

Critical Knowledge and Skills

Knowledge

Students will know:

- Random Variable
- Discrete Random Variable
- Continuous Random Variable
- Discrete Probability Distribution
- Mean of a Discrete Random Variable
- Standard Deviation of a Discrete Random Variable
- Expected Value
- Z-Score
- Empirical Rule
- Continuous Probability Distribution
- Normal Distribution
- Standard Normal Distribution

Skills

Students will be able to:

- Distinguish between discrete random variables and continuous random variables.
- Determine if a distribution is a probability distribution.
- Construct a discrete probability distribution and its graph and find the mean and standard deviation.
- Find the expected value.
- Find and interpret z-scores.
- Use the Empirical Rule to interpret standard deviation.
- Interpret graphs of normal probability distributions.
- Find areas under the standard normal curve.
- Find probabilities for normally distributed variables.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Small Group Work
- Whole Class Discussions
- Application Questions
- Reflections
- Homework
- Quizzes

School Summative Assessment Plan

Probability Distributions Unit Test: Students will be assessed on their knowledge about discrete and continuous probability distribution.

Primary Resources

Elementary Statistics: Picturing the World (4th Edition) by Ron Larson and Betsy Farber

Supplementary Resources

- Statistics Through Applications (Second Edition) by Daren S. Starnes, Daniel S. Yates, and David S. Moore
- Fundamentals of Statistics (Third Edition) by Michael Sullivan, III
- Workshop Statistics: Discovering with Data and the Graphing Calculator (Second Edition) by Allan J. Rossman, Beth L. Chance, and J. Barr Von Oehsen
- Activities and Projects for Introductory Statistics Courses (Second Edition) by Ron Millard and John C. Turner
- Stat Medic (<https://www.statsmedic.com>)
- IXL (<https://www.ixl.com>)

Technology Integration and Differentiated Instruction

Technology Integration

- **Google Products**
 - Google Classroom - Used for daily interactions with the students covering a vast majority of different educational resources (Daily Notes, Exit Tickets, Classroom Polls, Quick Checks, Additional Resources/ Support, Homework, etc.)
 - GAFE (Google Apps For Education) - Using various programs connected with Google to collaborate within the district, co-teachers, grade level partner teacher, and with students to stay connected with the content that is covered within the topic. Used to collect data in real time and see results upon completion of the assignments to allow for 21st century learning.
- **Desmos Products**
 - Desmos Classroom - Used for daily interactions with the students covering a vast majority of different educational resources (Daily Notes, Exit Tickets, Classroom Polls, Quick Checks, Additional Resources/ Support, Homework, etc.)
- **One to One Student's laptop**
 - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the Gifted Students are to be given the Extending Concepts Questions.
- These questions are to push the knowledge of each portion of the lesson. Extending Concepts Questions are located in the textbook at the end of each section's exercises.

English Language Learners (N.J.A.C.6A:15)

- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Encourage student to seek extra help.
- Work with Guidance Counselor and I&RS Team to create an intervention plan.

Special Education Students (N.J.A.C.6A:8-3.1)

- Allow for extra time (if needed)
- Hard copy of notes
- Chunking of problems
- Preferential seating
- Work with contact teacher to assist with additional accommodations noted in IEP/504 plans.

Interdisciplinary Connections

MATH -

ELA - Students justify reasoning through oral and written communication.

SCIENCE - Students use probability distributions to analyze IQ scores.

SOCIAL STUDIES -

WORLD LANGUAGES -

VISUAL/PERFORMING ARTS -

HEALTH/PHYSICAL EDUCATION - Students use z-scores, the Empirical Rule and probability distributions to analyze height and weight. Students use probability distributions to analyze an athlete's use of a stair climber.

APPLIED TECHNOLOGY/BUSINESS - Students use probability distributions to analyze paint blemishes when manufacturing a car. Students use probability distributions to analyze chicken wing sales. Students use probability distributions to analyze home computer use.

GLOBAL AWARENESS -

Learning Plan / Pacing Guide

Week 1:

- Game of Greed: Students play the game of greed to gather data and analyze. Through this activity, students are introduced to the vocabulary random variable, discrete random variable, continuous random variable, and discrete probability distribution. In addition, students learn how to find the mean, standard deviation, and

expected value for a discrete probability distribution.

- Unit 4 Lesson 1 and 2 Review
- Unit 4 Lesson 1 and 2 Quiz

Week 2:

- Where do I stand? Students create a human number line using their heights. Through this activity, students are introduced to z-score, Empirical Rule, continuous probability distribution, normal curve, and standard normal curve.
- Real-World Applications: Students are given various real-world problems and apply their knowledge of z-scores and the standard normal distribution curve in order to determine probability that an event could occur.

Week 3:

- Unit 4 Lesson 3 - 6 Review
- Unit 4 Lesson 3 - 6 Quiz