Unit 5 - Statistics and Probability

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

Use random sampling to draw inferences about a population. Draw informal comparative inferences about two populations. Investigate chance processes and develop, use, and evaluate probability models. Modules 10 & 11.

Enduring Understandings

Statistics can be used to gain information about a population by examining a sample of a population.

Use data from random samples to draw inferences about a population.

Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities.

Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.

The larger numbers indicate greater likelihood.

A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

A uniform probability model is used to determine the likelihood of events.

A probability model, that may or may not be uniform, is made by observing frequencies in data generated by chance.

Probability of compound events are found using organized lists, tables, tree diagrams, and simulation.

Essential Questions

How can collection, organization, interpretation, and display of data be used to answer questions?

How can experimental and theoretical probabilities be used to make predictions or draw conclusions?

Learning Objectives

Analyze data that represents a population to make a prediction about that population.

Model theoretical data to represent a sample of a population.

Determine the measures of center and measures of variability for numerical data from random samples.

Predict the probability based on a long-run relative frequency table, student created.

Determine the theoretical and experimental data values of a single and compound event.

Develop a probability model by observing frequencies in data generated from a chance process.

Standards: Content

7.SP	Statistics and Probability
7.SP.A	Use random sampling to draw inferences about a population
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
7.SP.B	Draw informal comparative inferences about two populations
7.SP.B.3	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.
7.SP.B.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
7.SP.C	Investigate chance processes and develop, use, & evaluate probability models
7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
7.SP.C.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.C.7.a	Develop a uniform probability model by assigning equal probability to all outcomes and

	use the model to determine probabilities of events.
7.SP.C.7.b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
7.SP.C.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
7.SP.C.8.a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
7.SP.C.8.b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
7.SP.C.8.c	Design and use a simulation to generate frequencies for compound events.

Standards: Interdisciplinary

9.1.8.CDM.4	Evaluate the application process for different types of loans (e.g., credit card, mortgage, student loans).
9.1.8.CP.1	Compare prices for the same goods or services.
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.1.8.DA.4	Transform data to remove errors and improve the accuracy of the data for analysis.
8.1.8.DA.5	Test, analyze, and refine computational models.
8.1.8.AP.1	Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
8.1.8.AP.2	Create clearly named variables that represent different data types and perform operations on their values.

Assessment Evidence

Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Games, Exit Slips, Pre-Assessments, Math Message – Warm up, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips, Pre-Assessments
Summative	LinkIt Benchmark Assessments, Tests, Pre-Assessments, Quizzes, Written Responses
Alternative & Benchmark	Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Benchmark - LinkIt Benchmark Assessments, Totowa TPA
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, iPads, websites and digital interactives/models, multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Assorted Manipulatives, Khan Academy, Crosswalk Coach for the Common Core Standards, Ready Common Core Mathematics Instruction and Practice, Common Core Coach, Calculators, Reveal Math Resources.

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness	X	Relationship Skills
X	Responsible Decision-Making		Social Awareness
X	Self-Management		

21st Century Skills & Themes

	Global and Cultural Awareness	X	Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
X	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning

	Civic Financial Responsibility		Financial Psychology		