

# Unit 5: Probability

Content Area:     **Math**  
Course(s):  
Time Period:  
Length:            **20 Days**  
Status:            **Published**

## State Mandated Topics Addressed in this Unit

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N/A	N/A

## Probability

## Learning Objectives

- Compute (using technology) and interpret the correlation coefficient of a linear fit.
- Distinguish between correlation and causation.
- Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies).
- Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- Recognize possible associations and trends in the data.
- Recognize that there are data sets for which such a procedure is not appropriate.
- Represent data with plots on the real number line (dot plots, histograms, and box plots).
- Summarize categorical data for two categories in two-way frequency tables.
- Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- 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.
- Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages.

## Essential Skills

- Compare the center (mean/median) and spread (interquartile range, standard deviation) of two (or more) different data sets
- Compute the correlation coefficient of a linear fit.

- Distinguish between correlation and causation.
- Interpret differences in shape, center, and spread in data sets, accounting for the effects of outliers
- Interpret the correlation coefficient of a linear fit.
- Interpret the relative frequencies including joint, marginal and conditional relative frequencies.
- Interpret the slope/rate of change of a linear model.
- Recognize possible trends and associations in the data.
- Recognize when appropriate to use mean and Standard deviation for data sets.
- Represent data with plots on the real number line
- Summarize data in a two-way frequency table.
- Use Calculators, spreadsheets and tables to estimate area under the normal curve.
- Use mean and standard deviation for data set to fit a normal distribution and estimate population percentages.
- Use statistics appropriate to the shape of a data distribution

## Standards

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MATH.9-12.S.ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
MATH.9-12.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.
MATH.9-12.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).
MATH.9-12.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.
MATH.9-12.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.
MATH.9-12.S.ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
MATH.9-12.S.ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.
MATH.9-12.S.ID.C.9	Distinguish between correlation and causation.

## Instructional Tasks/Activities

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- Lab: Fundamental Counting Principle
- Project: Probability Game Board Project
- Topic #1: Sample spaces and The Fundamental Counting Principle
- Topic #4: The Binomial Theorem
- Topic #5: Sets
- Topic #6: Independence and Conditional Probability

- Topic #7: Probability from Permutations & Combinations
- Topic# 2: Permutations
- Topic#3: Combinations

## **Assessment Procedure**

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- Class Discussions
- Classroom Total Participation Technique
- Classwork/homework
- Compare/Contrast Journals
- DBQ
- Electronic Active Responders
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Identify the Error Problems
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Quizzes/Tests
- Response and Analysis Questions
- Rubric
- Teacher Collected Data
- Teacher Observations
- Test
- Worksheet

## **Recommended Technology Activities**

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- Appropriate Content Specific Online Resource
- Chromebook
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Desmos

- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify
- TI-Nspire CX-Cas activities throughout the unit as appropriate

## **Accommodations & Modifications & Differentiation**

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Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

## **Special Education**

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- 1. Restructure lesson using UDL principals ([http://www.cast.org/our-work/about-udl.html#.VXmoXcfD\\_UA](http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA))
- 2. Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- 3. Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- 4. Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- 5. Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- 6. Use project-based science learning to connect science with observable phenomena.
- 7. Structure the learning around explaining or solving a social or community-based issue.
- 8. Provide ELL students with multiple literacy strategies.
- 9. Collaborate with after-school programs or clubs to extend learning opportunities.

## **Gifted and Talented**

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- Compare & Contrast
- Conferencing

- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

## **Instruction/Materials**

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- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

## **Environment**

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- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans

- provide desktop list/formula

## **Honors Modifications**

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Because honors students begin the year at a later point in the curriculum, this unit is designed as an honors-only unit.

## **Resources**

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- <http://www.corestandards.org/the-standards/mathematics>
- <https://njctl.org/courses/math/pre-calculus/>
- Infinite Pre-calculus