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 frequences 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

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

- 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

- 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

- 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

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

- 1. Restructure lesson using UDL principals (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

- Compare & Contrast

- Conferencing

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

Instruction/Materials

- 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

- 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

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

honors-only unit.

Resources

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