Unit 6: Statistics and Probability

Content Area: **Mathematics**
Course(s): **Accelerated Math 7**
Time Period: **4th Marking Period**
Length: **3 Weeks**
Status: **Published**

Unit Overview

In this unit, students understand and use the terms "event," "sample space," "outcome," "chance experiment," "probability," "simulation," "random," "sample," "random sample," "representative sample," "overrepresented," "underrepresented," "population," and "proportion." They design and use simulations to estimate probabilities of outcomes of chance experiments and understand the probability of an outcome as its long-run relative frequency. They represent sample spaces (that is, all possible outcomes of a chance experiment) in tables and tree diagrams and as lists. They calculate the number of outcomes in a given sample space to find the probability of a given event. They consider the strengths and weaknesses of different methods for obtaining a representative sample from a given population. They generate samples from a given population, e.g., by drawing numbered papers from a bag and recording the numbers, and examine the distributions of the samples, comparing these to the distribution of the population. They compare two populations by comparing samples from each population.

Transfer

Students will be able to independently use their learning to solve real world problems involving...

- statistics 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.
- random sampling to produce representative samples and support valid inferences.
- two data distributions compared using visual and numerical representations based upon measures of center and measures of variability to draw conclusions.
- the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
- the probability of a chance event is approximated by collecting data on the chance process that produces it, observing its long-run relative frequency, and predicting the approximate relative frequency given the probability.
- a probability model, which may or may not be uniform, is used to find probabilities of events.
- various tools are used to find probabilities of compound events. (Including organized lists, tables, tree diagrams, and simulations.)

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

Understandings

Students will understand that...

- Experimental results tend to approach theoretical probabilities after a large number of trials.
- Probabilities can be used to make informed decisions
- Certain probability models may not be valid in all situations
- Measures of center allow for analysis of data/data sets.
- Data, both overall patterns and individual points, has meaning in context

Essential Questions

Students consider...

- How does probability relate to real world application problems?
- How can measures of center and variation be used to compare two sets of data?
- How are different events classified and what can I use to solve them?
- How can information from a problem be represented in a way to see a pattern or frequency?
- How can I generate a random sample, and use it to make inferences (in writing) about the population?

Application of Knowledge and Skill

Students will know...

Students will know...

- how to develop understanding of statistical variability.
- how to summarize and describe distributions.
- how to display data in various ways
- how to interpret and summarize data as a numerical set in relation to its context.

Students will be skilled at...

Describing

- observations and predictions during a game
- patterns observed in repeated experiments
- chance experiments to model situations
- a simulation used to model a situation
- observations about data sets

Explaining

- predictions
- how to determine which events are more likely
- possible differences in experimental and theoretical probability
- how to use simulations to estimate probability
- how to use a simulation to answer questions about the situation

Justifying

- whether situations are surprising and possible
- which samples are or are not representative of a larger population
- which samples correspond with each show, which show is most appropriate for a commercial, and whether a movie is eligible for an award
- reasoning about samples and populations
- whether or not differences between samples are meaningful

Comparing

- sample spaces and probably of outcomes for different spinners
- methods for writing sample spaces
- heights of two groups
- measures of center with samples
- sampling methods
- populations based on samples

Academic Vocabulary

center (of a distribution)
certain
chance experiment
distribution
equally likely as not
event
impossible
interquartile range (IQR)
less likely
likely
mean
mean absolute deviation (MAD)
meaningful difference
measure of center
measure of variability
median
more likely
outcome
overlap
population
probability
proportion
random
random sample
representative sample
sample
sample space
simulation
spread
survey
symmetric
tree (diagram)
unlikely
very different

Learning Goal 1

Design and use simulations to estimate probabilities of outcomes. Calculate the number of outcomes in a given sample space to find the probability of a given event. Consider the strengths and weaknesses of different methods for obtaining a representative sample from a given population.

Target #1.1 -- DOK: 2 Skill/Concept

SWBAT

- describe the likelihood of events using the words impossible, unlikely, equally likely as not, likely, or certain.
- tell which event is more likely when the chances of different events are expressed as fractions, decimals, or percentages.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

Target #1.2 -- DOK: 2 Skill/Concept

SWBAT:

- use the sample space to calculate the probability of an event when all outcomes are equally likely.
- write out the sample space for a simple chance experiment.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MA.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.
MA.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.
MA.7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

Target #1.3 -- DOK: 2 Skill/Concept

SWBAT:

- estimate the probability of an event based on the results from repeating an experiment.
- explain whether certain results from repeated experiments would be surprising or not.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MA.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.
MA.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.
MA.7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

Target #1.4 -- DOK: 2 Skill/Concept

SWBAT:

- calculate the probability of an event when the outcomes in the sample space are not equally likely.
- explain why results from repeating an experiment may not exactly match the expected probability for an event.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.6	Attend to precision.
MA.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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MA.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.
MA.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.

MA.7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

Target #1.5 -- DOK: 2 Skill/Concept

SWBAT

- simulate a real-world situation using a simple experiment that reflects the probability of the actual event.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.7.SP.C	Investigate chance processes and develop, use, and evaluate probability models.
MA.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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MA.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.
MA.7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
MA.7.SP.C.8c	Design and use a simulation to generate frequencies for compound events.

Target #1.6 -- DOK: 3 Strategic Thinking

SWBAT:

- use a simulation to estimate the probability of a multi-step event.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.7.SP.C.8c	Design and use a simulation to generate frequencies for compound events.

Target #1.7 -- DOK: 2 Skill/Concept

SWBAT:

- write out the sample space for a multi-step experiment, using a list, table, or tree diagram.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.7.SP.C.8b	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.

Target #1.8 -- DOK: 2 Skill/Concept

SWBAT:

- use the sample space to calculate the probability of an event in a multi-step experiment.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.7.SP.C.8a	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.
MA.7.SP.C.8b	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.

Target #1.9 -- DOK: 3 Strategic Thinking

SWBAT:

- design a simulation to estimate the probability of a multi-step real-world situation.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.6	Attend to precision.
MA.7.SP.C.8c	Design and use a simulation to generate frequencies for compound events.

Target #1.10 -- DOK: 3 Strategic Thinking

SWBAT:

- calculate the difference between two means as a multiple of the mean absolute deviation.
- when looking at a pair of dot plots, determine whether the distributions are very different or have a lot of overlap.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.7.SP.B	Draw informal comparative inferences about two populations.
MA.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.

Target #1.11 -- DOK: 3 Strategic Thinking

SWBAT:

- explain why it may be useful to gather data on a sample of a population.
- when encountering a statistical question, name the population of interest and give an example of a sample for that population.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.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.
MA.7.SP.B	Draw informal comparative inferences about two populations.

Target #1.12 DOK: 3 Strategic Thinking

SWBAT

- determine whether a sample is representative of a population by considering the shape, center, and spread of each of them.

- know that some samples may represent the population better than others.
- remember that when a distribution is not symmetric, the median is a better estimate of a typical value than the mean.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.7	Look for and make use of structure.
MA.7.SP.A	Use random sampling to draw inferences about a population.
MA.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.
MA.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.

Target #1.13-- DOK: 2 Skill/Concept

SWBAT

- describe ways to get a random sample from a population.
- know that selecting a sample at random is usually a good way to get a representative sample.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.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.
MA.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.
MA.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.

Target #1.14 -- DOK: 3 Strategic Thinking

SWBAT

- consider the variability of a sample to get an idea for how accurate my estimate is.
- estimate the mean or median of a population based on a sample of the population.

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.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.
MA.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.
MA.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.

Target #1.15 -- DOK: 3 Strategic Thinking

SWBAT

- estimate the proportion of population data that are in a certain category based on a sample.

MA.7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
MA.7.SP.A	Use random sampling to draw inferences about a population.
MA.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.
MA.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.

Target #1.16-- DOK: 3 Strategic Thinking

SWBAT

- use the means from many samples to judge how accurate an estimate for the population mean is.
- know that as the sample size gets bigger, the sample mean is more likely to be close to the population mean.

MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.7.SP.A	Use random sampling to draw inferences about a population.
MA.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.

Target #1.17 -- DOK: 3 Strategic Thinking

SWBAT

- calculate the difference between two medians as a multiple of the interquartile range.
- determine whether there is a meaningful difference between two populations based on a sample from each population.

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.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.
MA.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.

Target #1.18 -- DOK: 3 Strategic Thinking

SWBAT

- decide what information is needed to know to be able to compare two populations based on a sample from each.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.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.

Target #1.19-- DOK: 4 Extended Thinking

SWBAT

- compare two groups by taking a random sample, calculating important measures, and determining whether the populations are meaningfully different.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.7.SP.A	Use random sampling to draw inferences about a population.
MA.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.
MA.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.
MA.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.
MA.7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

Formative Assessment and Performance Opportunities

- cK-12 Adaptive Practice
- Clicker

- Exit/Admit Ticket
- Journal
- Status Check (Thumbs up/down...)
- Student Presentations
- Student-Teacher Conference
- Think-Pair-Share

Summative Assessment

- End of Unit Test
- LinkIt!
- Portfolio
- Pre-Unit Diagnostic Test
- Project
- Quiz

21st Century Life and Careers

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they

	follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP9.1	Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
TECH.8.1.8.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.8.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.8.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.8.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.8.E.CS1	Plan strategies to guide inquiry.
TECH.8.1.8.F.CS2	Plan and manage activities to develop a solution or complete a project.
TECH.8.1.8.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.

Accommodations & Modifications

- 504 accommodations
- academic games
- centers
- challenge problems
- IEP modifications
- manipulatives
- math menus
- peer tutoring groups
- performance based tasks
- project based activities
- small group instruction
- student interviews
- To challenge students, have them find misleading data displays and questions that could be bias.

- use of technology
- Use technology or software to draw data displays

Unit Resources

See also: Illustrative Math Tasks Folder in Curriculum Portal

ALEKS

[cK-12 Accelerated 7th Grade Book](#)

Mr. Morgan's Math Help

   [Unit 7.8 Probability and Sampling](#)

NJCTL (New Jersey Center for Teaching and Learning)

   [Statistics & Probabilities](#)

cK-12 PLIX:

   Measurement of Probability: [Basketball Throw](#)

   Measurement of Probability: [Socks](#)

Desmos activities:

   Probability: [Chance Experiments](#)

   Data point analysis: [Classy Cats](#)

Interdisciplinary Connections

After introducing each type of data display, provide opportunities for students to discuss an appropriate data display to analyze data collected during science.

SCI.MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.