Trimester:	Unit Title:	Recommended Instructional Days:
3	**Statistics**	**12 - 16 days**

Domains: Statistics and Probability

Strand:

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. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

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. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*

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. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Key:

Major Cluster **Supporting Cluster** **Additional Cluster** **Climate Change Opportunity**

Progress Indicators: ◊ Tests ◊ Homework / Classwork ◊ Projects ◊ Formative Assessments ◊ Summative Assessments

Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reason of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit

Essential Questions:
Lesson 1: What is the difference between a population and a sample? What is the difference between an unbiased sample and a biased sample?
Lesson 2: What constitutes a random sample? How can you use a random sample to make inferences about a population? How can you generate and use random samples to represent a population?
Lesson 3: How do you compare two sets of data displayed in dot plots? How do you compare two sets of data displayed in box plots?
Lesson 4: How can you use random samples to compare populations?

Essential Understandings:
Statistics are a way of examining a population.
A statistic is only valid if the sample is representative of the population.
Measures of center and variability allow us to draw conclusions about the population.
The analysis and interpretation of data depends on the type of displays.
Examining a sample is a way to gain information and make generalizations about a population.
Generalizations about a population from a sample are valid only if the sample is representative of that population.
Comparing measures of center can help to make generalizations about sets of data.

Vocabulary:
- population
- sample
- unbiased sample
- biased sample

**Encourage students to practice using the unit vocabulary as they talk and write about mathematics. Understanding vocabulary will aid their understanding of the concepts. When students encounter a new definition, encourage them to write in their Big Ideas Student Journals. They will revisit these definitions during the Chapter Review.*

Suggested Activity Descriptions:

- Chapter Exploration problems on TB page 324.
- Exploration Activities at the beginning of each section.
- Ask students to create a short (2-3) question survey and use it to collect data amongst their classmates. Based on their data, students should be able to determine their sample and if it was random or not. Ask students to make improvements on their collection methods to ensure it is a random sample.
- Take a quick poll of your classroom regarding the time in which they go to bed each evening. Then, ask the girls (or one half of the class) to put their sticky note on the board in the appropriate column. Have the other half of the class do the same on another graph. Use the sticky notes to create either a dot plot or a histogram. Have students compare the two sets as a class.
- Have students research Census information and choose a few categories to compare. Have them find several measures of central tendencies and write a paragraph using this information to compare them.
- Have students gather information about two sports teams such as their height or weight then ask them to find the mean, median, mode, and range of each set. Have them use these measures to compare the data and make generalizations about each team based on a random sampling.
- M and M and M from the Big Ideas Game Library.

Interdisciplinary Connections:
Science:

1. Big Ideas STEAM Video and corresponding questions on TB page 323.
2. Big Ideas STEAM Performance Task. QR Code on TB page 349.
3. Question #14 on TB page 342: A scientist experiments with mold colonies of equal area. She adds a treatment to half of the colonies. After a week, she measures the area of each colony. If the areas are significantly different, the scientist will repeat the experiment. The results are shown. Should the scientist repeat the experiment? Justify your answer.

Social Studies:

1. Question #19 on TB page 330: To predict the result of a mayoral election, you survey 50 likely voters at random. The diagram shows the results. Describe whether the sample can be used to predict the outcome of the election. If so, what is your prediction for the number of votes received by the winner assuming that 500 people vote?
2. Question #15 on TB page 336: Explain why public opinion polls use sample sizes of more than 1000 people instead of using a smaller sample size.

Physical Education:

1. Question #12 on TB page 342: The double box-and-whisker plot represents the goals scored per game by two hockey teams during a 20-game season. Is the number of goals scored per game significantly greater for one team than the other? Explain.
2. Question #9 on TB page 352: The double box-and-whisker plot represents the points scored per game by two football teams during the regular season. Compare the data sets using measures of center and variation. Which team is more likely to score 18 points in a game?

Language Arts:

1. Writing Question #4 on TB page 327: You want to estimate the number of students in your school who play a school sport. You ask 40 honors students at random whether they play a school sport. Is this sample biased or unbiased? Explain.

Spot Light On: Sally Ride

Social and Emotional Learning: *Competencies*	**Social and Emotional Learning: *Sub-Competencies***
SEL Competencies: • Self-Awareness • Social Awareness • Self-Management • Relationship Skills • Responsible Decision-Making	• Recognizing the importance of self-confidence in handling daily tasks and challenges. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Identify and apply ways to persevere through alternative methods to achieve goals. • Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills.
Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
<u>Formative Assessments:</u> • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Big Ideas Student Journals • Homework/Classwork • Teacher Created Assessments • Progress Monitoring Items • Formative Assessment Tips in Big Ideas Teacher Edition	**<u>Benchmarks & Summative Assessments:</u>** • Chapter/Unit Assessments • Standardized Tests • Project-based Assessments • Benchmark Tests

Differentiated Student Access to Content:
Teaching and Learning *<u>Resources/Materials</u>*

Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
Big Ideas Student Journal, Dynamic Assessment System, iReady, Khan	Reteach worksheets, Extra Practice worksheets, Math manipulatives,	Dictionary for native language, Video tutorial in native language, ELL	ST Math Challenge Objectives, G&T tasks, Enrichment and

Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, Edulastic, Achieve the Core, Desmos	Scaffolding Instructions in each section of textbook, Tutorial Videos, Skills Review Handbook, Skills Trainer	Support in each section of Big Ideas Teacher's Edition	Extension worksheets, Art of Problem Solving, Leveled assessments

Supplemental Resources

Technology:
• Chromebooks • Scientific Calculators • Online math manipulatives
Other:
• Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics.	Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect students to related content.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept(s):** Civic Financial Responsibility	
	Core Ideas:	Philanthropic and charitable organizations play important roles in supporting the interests of individuals and local and global communities and the issues that affect them.
	Performance Expectation/s:	9.1.8.CR.1: Compare and contrast the role of philanthropy, volunteer service, and charities in community development and the quality of life in a variety of cultures.
	Career Readiness, Life Literacies, & Key Skills Practices	
	Act as a responsible and contributing community member and employee. **Attend to financial well-being.** **Consider the environmental, social and economic impacts of decisions.** **Demonstrate creativity and innovation.** **Utilize critical thinking to make sense of problems and persevere in solving them.** **Model integrity, ethical leadership and effective management.** **Plan education and career paths aligned to personal goals.** **Use technology to enhance productivity, increase collaboration and communicate effectively.** **Work productively in teams while using cultural/global competence.**	

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	**X**	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	**X**	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*