Marking Period	Unit Title	Recommended Instructional Days
3	Statistics	20 - 24

Domain

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.*

■ **7.RP.A.2** Recognize and represent proportional relationships between quantities.
c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*

7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

Key:

⬛ **Major Cluster**   ◻ **Supporting Cluster**   ◉ **Additional Cluster**

Progress Indicator: ◊ 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:
Module 10:
How can you use random samples and populations to solve real-world problems?
How can statistical information be helpful in real life?
How can you use a sample to gain information about a population?
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?

Module 11:
How can you solve real-world problems by analyzing and comparing data?
How can you determine what type of graph will best display the data?
How do you compare two sets of data displayed in dot plots?
How do you compare two sets of data displayed in box plots?
How can you use statistical measures to compare populations?
When two populations overlap graphically, what can you conclude?

Essential Understandings:
Module 10:
Statistics are a way of examining a population.
A statistic is only valid if the sample is representative of the population.

Module 11:
Measures of center and variability allow us to draw conclusions about the population.

Vocabulary:
- biased sample
- population
- random sample
- 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.

Suggested Activity Descriptions:
- 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.
- GoMATH Unit 5 Review Project: A Sample? Simple!

◇Suggested Sample Tasks:
Interdisciplinary Connections: Life Literacies
Content: Digital Citizenship

According to data from a survey, 5,000 middle-school students in Jefferson County spend a median of 9 hours per day using media. Of this time, about 6 hours is spent viewing screens such as televisions, computers, and smartphones.

Question 1:
Ms. Keating's math class randomly samples 60 of the 275 students at Valleydale School. The data they collected are shown in the box plots below.
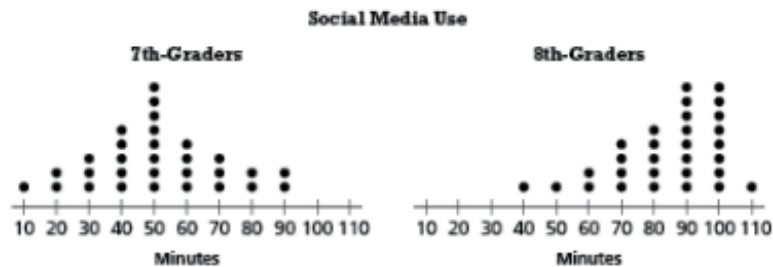

Part A
What comparative inferences about media usage can you make between the county average and students at Valleydale School using measures of center? Why might there be a difference? Explain.

Part B
How do the medians of the screen time in each sample compare? What comparative inference can you make based on media usage and screen time medians?

Question 2:
Ms. Keating's class collects data about social media use from random samples of students at Valleydale School as shown in the dot plots below.

Part A
What are the mean values of each dot plot?

Part B
The county survey also found that the average time spent per day on social media use for 7th grade students is 52 minutes, while 8th graders spend 1 hour and 32 minutes. How do the mean values of Valleydale school compare to the county averages?

Question 3:
Ms. Keating's class wants to compare the use of social media between the 7th grade and 8th grade students at Valleydale School. The MAD for both data sets is approximately 14. What can you infer about the two sets of data? Explain.

KEY:

Question 1
Part A
Sample answer: The median of 8 hours for students at Valleydale School is one hour less than the county median of 9 hours. One possible reason for a difference between the two populations is that the sample might be too small, thus not really representative.

Part B
Sample answer: The median screen time for Valleydale School is 6 hours compared to 6.5 hours for the county. Valleydale students use less media overall, but a higher percentage of time viewing screens.

Question 2
Part A
51 minutes; 84 minutes

Part B
Sample answer: The seventh-grade students use social media on a consistent average with the county. The eighth-grade students use social media on a slightly lower average than the county.

Question 3
Sample answer: Eighth-grade students use social media more, but the variability of the data sets is about the same.

Interdisciplinary Connections:
Science:
1. Careers in Math (GoMATH page 305)
2. Unit 5 Performance Task #1: An entomologist is studying how two different types of flowers appeal to butterflies. The box-and-whisker plots show the number of butterflies that visited one of two different types of flowers in a field. The data were collected over a two-week period, for one hour each day. (See corresponding plots and questions.) (GoMATH page 358)

Language Arts:
1. Vocabulary Preview Activity on GoMATH page 306.
2. Reading Startup Activities on GoMATH pages 309 and 333.

Physical Education:
1. Mini-Task: The tables show the typical number of minutes spent exercising each week for a group of fourth-grade students and a group of seventh-grade students. (See corresponding tables and questions.) (GoMATH page 360)

Spot Light On: Katherine Johnson

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:*
Formative Assessments: • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Math Journals • Homework/Classwork • Teacher created assessments	**Benchmarks & Summative Assessments:** • Chapter/Unit Assessments • Standardized Tests • District Assessments • Project-based Assessments

Differentiated Student Access to Content: **Teaching and Learning _Resources/Materials_**			
Core **Resources**	**Alternate** **Core Resources** *IEP/504/At-Risk/ESL*	**ELL** **Core Resources**	**Gifted & Talented** **Core Resources**
Go Math Workbook, IXL, Personal Math Trainer, Math on the Spot Videos, My HRW, Khan Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, Edulastic, Achieve the Core, Desmos	Reteaching worksheets, Skill building workbook, Math manipulatives, Leveled practice worksheets	Dictionary for native language, Video tutorial in native language, Success for English Learners worksheets, GoMATH Leveled Strategies for English Learners, GoMATH Linguistic Support	ST Math Challenge Objectives, G&T tasks, Enrichment worksheets, Art of Problem Solving, Leveled assessments, GoMATH Teaching for Depth, Math Olympiad

Supplemental Resources
Technology: • Chromebooks • Scientific/Graphing Calculators (upper grades only) • 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 student to related content.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept(s):** Digital Citizenship	
	Core Ideas:	Digital identities must be managed in order to create a positive digital footprint.
	Performance Expectation/s:	9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.
	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)					
X Amistad Law: *N.J.S.A. 18A 52:16A-88*	Holocaust Law: *N.J.S.A. 18A:35-28*	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*