





Marking Period	Unit Title	Recommended Instructional Days
4	Statistics	12 - 17

**Domain**

**Strand:**

-  **8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
-  **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.
-  **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*
-  **8.SP.A.4** Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

**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 NJSL-CLKS within Unit**

**Essential Questions:**

**Module 14:**

How is a scatter plot different from other types of graphs such as line graphs or bar graphs?  
What purpose does a scatter plot serve, and when would it be helpful to display data on a scatter plot?  
How can you construct and interpret scatter plots?  
How can you describe the association of two data sets?  
How does a scatter plot show the relationship between paired data?  
How can you use a trend line to make a prediction from a scatter plot?

**Module 15:**

How can you construct and interpret two-way frequency tables?  
How can categorical data be organized and analyzed?  
How does a two-way frequency table show the relationship between sets of paired data?  
What is the advantage of a two-way relative frequency table for showing relationships between sets of paired data?

**Essential Understandings:**

**Module 14:**

Scatter plots can be used to display, analyze and problem solve with bivariate categorical data.  
Straight lines and their equations can be used to make predictions with scatter plots that display linear patterns.

**Module 15:**

Two-way tables are used to display two types of categorical data for a single population at the same time.  
Relative frequency tables can be used to display, analyze and problem solve with bivariate categorical data.

**Vocabulary:**

- scatter plot
- cluster
- outlier
- association
- trend line
- frequency
- two-way table
- relative frequency
- two-way frequency table
- joint relative frequency
- marginal relative frequency
- two-way relative frequency table
- conditional relative frequency

*\*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:**

- Have students record how many jumping jacks they can do in certain time intervals (15 seconds, 30 seconds, 45 seconds, etc.). Then, construct a class scatter plot comparing the time with the number of jumping jacks and discuss patterns of association, clustering, outliers, etc.
- Allow students the chance to develop their own survey questions and collect data on a large two-way table on the white board from the entire class. Students can write their names on a sticky note and place their name on the correct cell of the two-way table.
- GoMATH Activity 14.2 Prime Predictions (GoMATH TB page 444A - 444B)
- GoMATH Unit 6 Review Project: ALTITUDE OR LATITUDE?

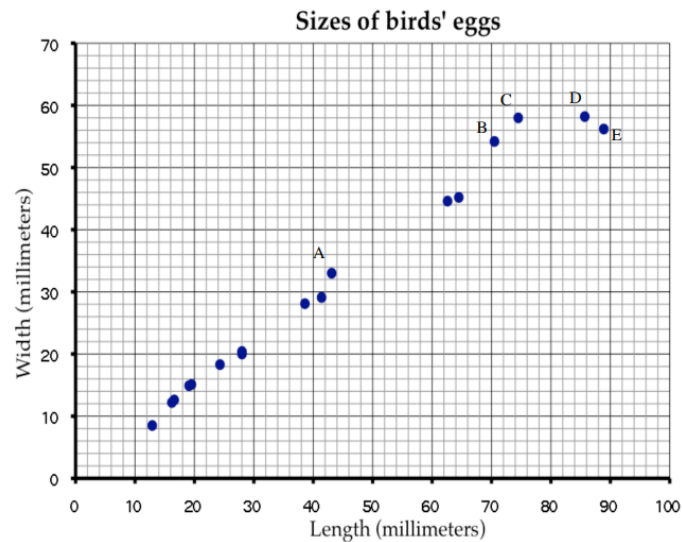
◇ **Suggested Sample Tasks:**

Activity Description: Birds' Eggs

Interdisciplinary Connections: Life Science

Content: Natural Selection and Adaptations

The scatter diagram shows the lengths and the widths of the eggs of some American birds.



1. A biologist measured a sample of one hundred Mallard duck eggs and found they had an average length of 57.8 millimeters and average width 41.6 millimeters. Use a X to mark a point that represents this on the scatter diagram.
2. What does the graph show about the connection between the lengths of birds' eggs and their widths?
3. Another sample of similar birds has eggs with a length of 35 millimeters on average. If these birds follow the trend in the scatterplot, about what width would you expect these eggs to be, on average?
4. Describe the differences in shape of the two eggs C and D.
5. Which of the eggs A, B, C, D, and E has the greatest ratio of length to width? Explain how you decided.

**KEY:**

1. Marks point correctly.

2. Gives a correct description such as: Generally, the greater the length of the egg, the greater is its width.
3. Draw a correct line of best fit. Find the correct equation of line of best fit, such as  $y = 3x/4$  accept slope 0.7 to 0.8. Give the correct answer: 25mm (Accept values between 22 and 28.)
4. They have the same width, but D is longer. or C is a shorter and fatter shape.
5. Gives a correct answer: E and Gives a correct explanation such as: The line joining E to the origin is the flattest of all the lines joining A, B, C, D, and E to the origin. or Gives all the ratios simplified for comparison.

**Interdisciplinary Connections:**

**Science:**

1. Suppose the geyser erupts for 2.2 minutes after a 75-minute interval. Would this point lie in one of the clusters? Would it be an outlier? Explain your answer.

**Language Arts:**

1. Vocabulary Preview Activity on GoMATH pg. 428
2. Reading Startup Activities on GoMATH pages 431 and 449.

**\*Grade 8 Math/Science Connection**

Marking Period: 4

Science Module: D Math Module(s): 14

Topics that Overlaps: Natural Selection/Statistics

Model Natural Selection in a Population Performance Task

Science Aspects: Students will model Natural Selection in a population. Students will analyze data and draw conclusions about the environment's role in determining which traits help individuals to survive and reproduce. (Unit 1 Lesson 2)

Skills: natural selection, data collection, data analysis, graphing.

Math Aspects: Students will create a scatter plot using the data collected in science class. They will then identify the correlation shown, draw a trend line, write its equation, and use it to make predictions.

Skills: creating a scatter plot, identifying correlation, drawing a trend line, writing an equation for a trend line, making predictions.

**Spot Light On:** Autumn Kent

<b>Social and Emotional Learning: Competencies</b>		<b>Social and Emotional Learning: Sub-Competencies</b>	
SEL Competencies: • Self-Awareness • Social Awareness • Self-Management • Relationship Skills • Responsible Decision-Making		<ul style="list-style-type: none"> <li>• Recognizing the importance of self-confidence in handling daily tasks and challenges.</li> <li>• Demonstrate an awareness of the expectations for social interactions in a variety of ways.</li> <li>• Demonstrate an understanding of the need for mutual respect when viewpoints differ.</li> <li>• Identify and apply ways to persevere through alternative methods to achieve goals.</li> <li>• Utilize positive communication and social skills to interact effectively with others.</li> <li>• Develop, implement, and model effective problem solving and critical thinking skills.</li> </ul>	
<b>Assessments (Formative)</b> <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		<b>Assessments (Summative)</b> <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
<b>Formative Assessments:</b> • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Math Journals • Homework/Classwork • Teacher created assessments		<b>Benchmarks &amp; Summative Assessments:</b> • Chapter/Unit Assessments • Standardized Tests • District Assessments • Project-based Assessments	
<b>Differentiated Student Access to Content: Teaching and Learning <u>Resources/Materials</u></b>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	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, GoMATH Extend-the-Math Activity, Math Olympiad

Supplemental Resources			
<p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>• Chromebooks • Scientific/Graphing Calculators (upper grades only) • Online math manipulatives</li> </ul> <p><b>Other:</b></p> <ul style="list-style-type: none"> <li>• Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives</li> </ul>			
Differentiated Student Access to Content: Recommended <i>Strategies &amp; Techniques</i>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	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.
<b>NJSLS CAREER</b>	<b>Disciplinary Concept(s):</b> Information and Media Literacy		
	<b>Core Ideas:</b>	Sources of information are evaluated for accuracy and relevance when considering the use of information.	

<b>READINESS, LIFE LITERACIES &amp; KEY SKILLS</b>	<b>Performance Expectation/s:</b>	9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose.
	<b>Career Readiness, Life Literacies, &amp; Key Skills Practices</b>	
	<p>Act as a responsible and contributing community member and employee.</p> <p>Attend to financial well-being.</p> <p>Consider the environmental, social and economic impacts of decisions.</p> <p>Demonstrate creativity and innovation.</p> <p>Utilize critical thinking to make sense of problems and persevere in solving them.</p> <p>Model integrity, ethical leadership and effective management.</p> <p>Plan education and career paths aligned to personal goals.</p> <p>Use technology to enhance productivity, increase collaboration and communicate effectively.</p> <p>Work productively in teams while using cultural/global competence.</p>	

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