



**Mathematics**

**Topic Name: Topic 8 Display, Describe, and Summarize Data**

**Resource: enVision Math 2.0, Pearson, 2016**

**Duration: May/June 6 Weeks**

**Enduring Understanding:**

- A statistical question anticipates variability in responses and can be answered by collecting and analyzing data.
- The mean, median, and mode are measures that can be used to describe the center of a data set.
- The range is a measure that can be used to describe the variability of a data set.
- A box plot is a good choice for displaying a distribution of numerical data values on a number line.
- Data values can be organized into equal intervals and displayed in a frequency table or histogram.
- Measures of variability, such as the mean absolute deviation (MAD) and interquartile range (IQR), describe the spread and clustering of data in a set.
- Data sets may best be described using different measures of center and variability.
- A set of numerical data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape.
- Many real-world problem situations can be represented with a mathematical model, but that model may not represent a real-world situation exactly.



**Essential Questions:**

- How are statistical questions different from other questions?
- How can you use a single measure to describe a data set?
- Why is the box plot useful for interpreting certain types of data?
- How can a frequency table or histogram help you organize and analyze data?
- How can the variability of data be described using a single number?
- Why is one statistical measure more useful than another to describe a given situation?
- How can you summarize a data distribution?

**Focus of Standards:**

Student Outcomes:	Skills	Assessments	Resources
<ul style="list-style-type: none"> <li>● I can identify statistical questions.</li> <li>● I can write statistical questions and display the collected data.</li> <li>● I can determine the mean, median, mode, and range of a data set.</li> <li>● I can display data in a box plot.</li> <li>● I can interpret and analyze a box plot.</li> <li>● I can organize data into equal intervals and display data in a frequency table or histogram.</li> <li>● I can interpret and analyze a histogram.</li> <li>● I can calculate the mean absolute deviation</li> </ul>	<ul style="list-style-type: none"> <li>● Recognize statistical questions</li> <li>● Summarize data using mean, median, mode, and range</li> <li>● Construct box plots in which to display data</li> <li>● Construct frequency tables and histograms in which to display data</li> <li>● Summarize data</li> </ul>	<p><b>Formative</b></p> <ul style="list-style-type: none"> <li>● Diagnostic assessment</li> <li>● Study Island</li> <li>● Kahoot!</li> <li>● Exit tickets</li> <li>● Round Robin group work               <ul style="list-style-type: none"> <li>○ Open ended questions</li> <li>○ May/may not be game activity</li> </ul> </li> <li>● Analysis of student</li> </ul>	<p><b>Texts:</b></p> <p><i>enVision 2.0 Common Core</i></p> <p><b>Digital:</b></p> <ul style="list-style-type: none"> <li>● Student/Teacher eText</li> <li>● Videos</li> <li>● MathXL</li> <li>● IXL</li> <li>● 3-Act Mathematical</li> </ul>



<p>(MAD) and interquartile range (IQR), of a data set.</p> <ul style="list-style-type: none"> <li>• I can summarize data using measures of variability.</li> <li>• I can select the most appropriate measure of center and variability for a data set.</li> <li>• I can use measures to describe data sets.</li> <li>• I can describe the center, spread, and overall shape of a data set.</li> <li>• I can summarize numerical data sets using measures of center and related measures of variability.</li> <li>• I can use mathematical modeling to represent a problem situation and to propose a solution.</li> <li>• I can test and verify the appropriateness of my math models.</li> <li>• I can explain why the results from my mathematical models may not align exactly to the problem situation.</li> </ul>	<p>using measures of variability</p> <ul style="list-style-type: none"> <li>• Choose appropriate statistical measures</li> <li>• Summarize data distributions</li> <li>• Use mathematical modeling</li> </ul>	<p>homework</p> <ul style="list-style-type: none"> <li>• Class polls <ul style="list-style-type: none"> <li>○ Show of hands: 1 finger ok, 2 fingers need help, 3 fingers lost</li> </ul> </li> <li>• One thing I learned/One thing I need work on</li> </ul> <p><b>Summative</b></p> <ul style="list-style-type: none"> <li>• End topic tests</li> <li>• Group topic assessment</li> <li>• EOY test</li> </ul> <p><b>Benchmark</b></p> <ul style="list-style-type: none"> <li>• Diagnostic assessment</li> <li>• Pearson benchmark tests</li> <li>• PARCC test</li> </ul> <p><b>Alternative</b></p> <ul style="list-style-type: none"> <li>• Work paper from tests will also be graded for additional points if reasoning is clear and correct, even if answer is wrong</li> <li>• One on one</li> </ul>	<p>Modeling</p> <ul style="list-style-type: none"> <li>• Virtual Nerd App</li> <li>• BouncePages App</li> <li>• Math Tools</li> <li>• Reflex Math</li> </ul> <p><b>Classroom Math Materials</b></p> <ul style="list-style-type: none"> <li>• Student text</li> <li>• Online text</li> <li>• Bounceapp</li> <li>• Digital toolkit</li> <li>• Math Practices and Problem Solving Handbook</li> </ul>
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		<p>conferencing</p> <ul style="list-style-type: none"> <li>• Oral questioning</li> </ul>	
<p><b>VOCABULARY</b></p>			
<p><b>Tier 2</b> Mean, median, range</p>		<p><b>Tier 3</b> Statistical question, mode, box plot, quartiles, frequency table, histogram, absolute deviation, mean absolute deviation (MAD), interquartile range (IQR), outlier, data distribution</p>	
<p><b>NJSLS Math Standards</b></p>		<p><b>NJSLS Math Practices</b></p>	
<p><b>Relevant Standards:</b>  <b>6.SP.A.1</b> Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.  <b>6.SP.A.2</b> Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.  <b>6.SP.A.3</b> Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.  <b>6.SP.B.4</b> Display numerical data in plots on a number line, including dot plots, histograms, and box plots.  <b>6.SP.B.5a</b> Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations.</p>		<p><b>MP.1</b> Make sense of problems and persevere in solving them  <b>MP.2</b> Reason abstractly and quantitatively.  <b>MP.3</b> Construct viable arguments and critique the reasoning of others.  <b>MP.4</b> Model with mathematics.  <b>MP.5</b> Use appropriate tools strategically.  <b>MP.6</b> Attend to precision.  <b>MP.7</b> Look for and make use of structure.</p>	



**6.SP.B.5b** Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

**6.SP.B.5c** Summarize numerical data sets in relation to their context, such as by: Giving quantitative measures of center and variability, as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

**6.SP.B.5d** Summarize numerical data sets in relation to their context, such as by: Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

**MP.8** Look for and express regularity in repeated reasoning.

**Interdisciplinary Connections**

NJSLS for ELA and Science are introduced, developed, and practiced in the context of learning math content and engaging in mathematical practices.

**ELA**

**ELA-Literacy.RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks

**ELA-Literacy.RST.6-8.4.**Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

**ELA-Literacy.RST.6-8.3** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).  
Read and comprehend grade level math word problems.

**ELA-Literacy.SL.6.1**Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.



**Science**

**MS-ESS2-2** Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

**MS-ETS1-2** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

**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.

**MS-ETS1-4** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

**NJSLS: 21st Century Life and Careers**

**Key Subjects and 21st Century:** Themes Mastery of key subjects and 21st century themes is essential to student success. Key subjects include English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics. In addition, schools must promote an understanding of academic content at much higher levels by weaving 21st century interdisciplinary themes into key subjects:

- Global Awareness
- Financial, Economic, Business and Entrepreneurial Literacy

**9.1.8.E.8** Compare the value of goods and services from different sellers when purchasing large quantities and small quantities.

**9.2.8.B.5** Analyze labor market trends using state and federal labor market information and other resources available online.

**9.1.8.B.7** Construct a budget to save for long-term, short-term, and charitable goals

**9.1.8.C.2** Compare and contrast credit cards and debit cards and the advantages and disadvantages of using each.

**9.1.8.C.5** Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, and mortgages) and compare the interest rates associated with each.

**Career Ready Practices:** Today's students need to develop thinking skills, content knowledge, and social and emotional competencies to



navigate complex life and work environments.

**CRP2.** Apply appropriate academic and technical skills.

**CRP4.** Communicate clearly and effectively and with reason.

**CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.

**CRP11.** Use technology to enhance productivity

**NJSLS Technology Standards**

**8.1.8.A.4** Graph and calculate data within a spreadsheet and present a summary of the results

**8.1.8.C.1** Collaborate to develop and publish work that provides perspectives in a global problem for discussions with learners from other countries

**8.1.8.F.1** Explore a local issue, by using digital tools to collect and analyze data to identify and make an informed decision.



<b>Integrated Differentiation/Accommodations/Modifications</b> <i>(Alternate Modes of Instruction and Support)</i>		
<b>Modifications to Support Gifted and Talented Students</b>	<b>Modifications to Support English Language Learners</b>	<b>Modifications to Support Our Learners (Students with IEPs/504s and At-Risk Learners)</b>
<p>Provide appropriate challenge for wide ranging skills and development areas.</p> <p>Participate in inquiry and project-based learning units of study</p> <p>Assigning roles within partnerships</p> <p>Differentiated supports: content, process, product, environment</p> <p>Assign enVision 2.0 Enrichment EnVision Math Tools and Games</p> <p>Have students discuss and share methods and processes of solving mathematical problems</p>	<p>Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)</p> <p>Provide students with visual models and hands-on materials.</p> <p>Front load and immerse students in literacy and language experiences related to content.</p> <p>Provide students with visual models, sentence stems, concrete objects, and hands-on materials.</p> <p>Model procedures for better understanding of skills.</p> <p>Collaboration between ELL and general education teacher to maximize learning.</p> <p>Use appropriate student level of enVision 2.0 practice problems and intervention.</p> <p>Using game like activities online, in order to</p>	<p>Review student individual educational plan and/or 504 plan.</p> <p>Establish procedures for accommodations and modifications for assessments as per IEP/504.</p> <p>Modify classroom environment to support academic and physical needs of the students as per IEP/504.</p> <p>Provide appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team.</p> <p>Provide Title I services to students not meeting academic standards in Math.</p> <p>Differentiation through content, process, product, environment.</p> <p>Introduce topics using multiple representations</p> <p>Provide instructional adaptations and interventions in the general education classroom.</p> <ul style="list-style-type: none"> <li>● Differentiated Intervention (enVision 2.0)               <ul style="list-style-type: none"> <li>○ Reteach</li> <li>○ Additional Vocabulary Support</li> <li>○ Build Mathematical Literacy</li> <li>○ Math tools and Games</li> </ul> </li> </ul>



	<p>engage ELL learners and aid in developing problem-solving skills and persistence</p> <p>Linguistically modify assessments</p>	<ul style="list-style-type: none"> <li>• IXL</li> <li>• MATHXL</li> </ul> <p>Have students communicate their reasoning, orally or on paper.</p> <p>Modify classroom environment to support student needs.</p> <p>If necessary, provide:</p> <ul style="list-style-type: none"> <li>• graph paper to organize math work</li> <li>• multiplication table</li> <li>• individual reference sheets</li> </ul> <p>Give extended time for tests</p> <p>Intensive individual intervention:</p> <ul style="list-style-type: none"> <li>• Rtl in enVision 2.0</li> </ul>
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**Sources**

New Jersey Student Learning Standards (2016) <http://www.state.nj.us/education/cccs/2016/math/standards.pdf>

New Jersey Student Learning Standards: Technology (2014) - <http://www.state.nj.us/education/cccs/2014/tech/8.pdf>

New Jersey Student Learning Standards: ELA (2014) - <https://www.state.nj.us/education/cccs/2016/ela/g03.pdf>

New Jersey Science and Engineering Practices - <https://www.state.nj.us/education/cccs/2016/science/>

NJ Career Ready Practices (2014) - <https://www.state.nj.us/education/cccs/2014/career/CareerReadyPractices.pdf>

Pearson enVision 2.0 (2016) <https://www.pearsonrealize.com/index.html#/>