










Trimester:	Unit Title:	Recommended Instructional Days:
3	Functions	12-15 days
Domain		
<p>Strand:</p> <p> 8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.</p> <p> 8.F.A.2 Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.</i></p> <p> 8.F.A.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.</i></p> <p> 8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.</p> <p> 8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.</p> <p>Key:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="display: flex; align-items: center;">  Major Cluster </div> <div style="display: flex; align-items: center;">  Supporting Cluster </div> <div style="display: flex; align-items: center;">  Additional Cluster </div> <div style="display: flex; align-items: center;">  Climate Change Opportunity </div> </div>		
<p>Progress Indicators: ♦ Tests ♦ Homework / Classwork ♦ Projects ♦ Formative Assessments ♦ Summative Assessments</p>		

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:

How can you identify and represent functions?
How can you determine if a table, graph or equation represents a functional relationship?
What are some characteristics that you can use to describe functions?
What distinguishes a linear relationship from a non-linear relationship?
How can you use tables, graphs, and equations to compare functions?
How can you describe a relationship given a graph and sketch given a description?
How can you analyze a graph that compares an object's distance with the time?

Essential Understandings:


A relationship is a function if every input has exactly one output.
Functions are either linear or non-linear based on certain characteristics.
Functions can be described and analyzed by using equations, tables and graphs.

Vocabulary:

- input
- output
- mapping diagram
- linear function
- nonlinear function


**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:

- STEAM Video *Apparent Temperature* and Performance Task *Heat Index* 
- Getting Ready for Chapter 7 Chapter Exploration TB page 274
- Chapter Explorations TB page 275 Interpreting Diagrams and Describing Relationships Between Quantities
- Chapter Explorations TB page 281 Use a Table to Describe Relationships and Using a Graph
- Chapter Exploration TB page 289 Writing and Graphing Functions
- Chapter Exploration TB page 295 Comparing Functions
- Chapter Explorations TB page 301 Matching Situations to Graphs and Interpreting a Graph
- Puzzle Time for each section (teacher resources)
- Enrichment and Extension Worksheets

Interdisciplinary Connections:

Science:

1. Question # 19 TB Page 280 *Modeling Real Life*: The normal pressure at sea level is 1 atmosphere of pressure ...
2. Question # 31 TB page 286 *Modeling Real Life*: A dolphin eats 30 pounds of fish per day ...
3. Question # 18 TB page 294 *Problems Solving*: The heat index is calculated using the relative humidity and the temperature... 
4. Question # 11 TB page 298: The loudness of sound is measured in decibels (dB)...
5. Question # 15 TB page 300 *Modeling Real Life*: The frequency y (in terahertz) of a light wave is a function of its wavelength x (in nanometers)...

Financial Literacy:

1. Question # 20 TB page 280 *Dig Deeper*: The table shows the cost of purchasing 1, 2, 3, or 4 T-shirts from a souvenir shop...
2. Question # 36 TB page 288 *Problem Solving*: You decide to make and sell bracelets. The cost of your materials is \$84.00...
3. Questions # 37 TB page 288 *Modeling Real Life*: A furniture store is having a sale where everything is 40% off ...
4. Question #5 TB page 291 *Interpreting a Linear Function*: The table shows the revenue R (in millions of dollars) of a company when it spends A (millions of dollars) on advertising...
5. Question # 6 TB page 292: Manager A earns \$15 per hour and receives a \$50 bonus...
6. Question # 16 TB page 294 *Reasoning*: You and your friend are saving money to buy bicycles that cost \$175 each...
7. Example 4 TB page 298 *Modeling Real Life*: Two accounts earn different types of interest...
8. Question # 24 TB page 306 *Dig Deeper*: You can use a supply and demand model to understand how the price of a product changes in a market ...

Technology:

1. Question # 7 TB page 292: Each month, you start with 2 gigabytes of data and use 0.08 gigabytes per day ...
2. Question # 12 TB page 298 *Dig Deeper*: A video blogger is someone who records a video library ...

<p>Language Arts: 1. Question # 5 TB page 277 <i>Precision</i>: Describe how relations and functions are different.</p> <p>Spot Light On: Dr. Stephon Alexander</p>			
<p align="center">Social and Emotional Learning: <i>Competencies</i></p>		<p align="center">Social and Emotional Learning: <i>Sub-Competencies</i></p>	
<p>SEL Competencies: • Self-Awareness • Social Awareness • Self-Management • Relationship Skills • Responsible Decision-Making</p>		<ul style="list-style-type: none"> • 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. 	
<p align="center">Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i></p>		<p align="center">Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i></p>	
<p>Formative Assessments: • 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</p>		<p>Benchmarks & Summative Assessments: • Chapter/Unit Assessments • Standardized Tests • Project-based Assessments • Benchmark Tests</p>	
<p align="center">Differentiated Student Access to Content: Teaching and Learning <i>Resources/Materials</i></p>			
<p align="center">Core Resources</p>	<p align="center">Alternate Core Resources <i>IEP/504/At-Risk/ESL</i></p>	<p align="center">ELL Core Resources</p>	<p align="center">Gifted & Talented Core Resources</p>
<p>Big Ideas Student Journal, Dynamic Assessment System, iReady, Khan</p>	<p>Reteach worksheets, Extra Practice worksheets, Math manipulatives,</p>	<p>Dictionary for native language, Video tutorial in native language, ELL</p>	<p>ST Math Challenge Objectives, G&T tasks, Enrichment and</p>

Grade 8 Mathematics
Big Ideas Unit 7: Functions

Updated
August 2024

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			
<p>Technology: • Chromebooks • Scientific Calculators • Online math manipulatives</p> <p>Other: • Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives</p>			
Differentiated Student Access to Content: Recommended <i>Strategies & 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 students to related content.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	Disciplinary Concept(s): Planning and Budgeting	
	Core Ideas:	A budget aligned with an individual’s financial goals can help prepare for life events.
	Performance Expectation/s:	9.1.8.PB.1: Predict future expenses or opportunities that should be included in the budget planning process.
	Career Readiness, Life Literacies, & Key Skills Practices	
	<p>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.</p>	

New Jersey Legislative Statutes and Administrative Code
(place an “X” before each law/statute if/when present within the curriculum map)

X	Amistad Law: <i>N.J.S.A. 18A 52:16A-88</i>		Holocaust Law: <i>N.J.S.A. 18A:35-28</i>		LGBT and Disabilities Law: <i>N.J.S.A. 18A:35-4.35</i>	X	Diversity & Inclusion: <i>N.J.S.A. 18A:35-4.36a</i>	X	Standards in Action: <i>Climate Change</i>
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