

8 Algebra 1 Unit 03: Graphing Linear Functions

Content Area: **Mathematics**
Course(s):
Time Period: **Marking Period 1**
Length: **19 days**
Status: **Published**

Unit Overview

Students are expected to work together on explorations, make conjectures, construct viable arguments, and critique the reasoning of others.

Focus on Major Work Chapter 3:

- Understand graphing linear functions.
- Refreshes and extends the concept of a function.
- Introduces the concepts of domain and range.
- There is a pairing of input and output.
- Functions are seen as describing situations in which one quantity determines another.
- Function notation and characteristics of functions are studied.

Students will be able to...

- understand the concept of a function.
- identify the graph of a linear functions.
- graph linear functions written in different forms.
- describe the characteristics of a function.
- determine whether a relation is a function.
- find the domain and range of a function.
- distinguish between independent and dependent variables.
- explain how a transformation affects the graph of a linear function.

Standards

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| MATH.9-12.F.BF.A.1 | Write a function that describes a relationship between two quantities. |
| MATH.9-12.F.BF.A.2 | Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. |
| MATH.9-12.F.BF.B.3 | Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. |
| MATH.9-12.F.BF.B.4 | Find inverse functions. |
| MATH.9-12.A.CED.A.2 | Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. |
| MATH.9-12.F.IF.A.1 | Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a |

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| | function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$. |
| MATH.9-12.F.IF.B.4 | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. |
| MATH.9-12.F.IF.B.5 | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. |
| MATH.9-12.F.IF.C.7.a | Graph linear and quadratic functions and show intercepts, maxima, and minima. |
| MATH.9-12.F.IF.C.7.b | Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. |
| MATH.9-12.A.REI.D.10 | Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). |
| MATH.9-12.F.IF.C.9 | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). |
| MATH.9-12.A.SSE.A.1.a | Interpret parts of an expression, such as terms, factors, and coefficients. |
| MATH.9-12.F.LE.A.1.a | Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. |
| MATH.9-12.F.LE.A.1.b | Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. |
| MATH.9-12.F.LE.B.5 | Interpret the parameters in a linear or exponential function in terms of a context. |

Materials

- Algebra 1
- 3.1 Functions
- 3.2 Characteristics of Functions
- 3.3 Linear Functions
- 3.4 Function Notation
- 3.5 Graphing Linear Equations in Standard Form
- 3.6 Graphing Linear Equations in Slope-Intercept Form
- 3.7 Transformations of Linear Functions
- 3.8 Graphing Absolute Value Functions
- [ST Math](#)
- [3 Act Lessons](#)
- [Brainiaccamp Manipulatives](#)
- [Desmos](#)
- [Brainpop Resources](#)
- [Delta Math](#)

Technology

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| CS.9-12.8.1.12.AP.2 | Create generalized computational solutions using collections instead of repeatedly using simple variables. |
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CS.9-12.8.1.12.AP.5

Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

CS.9-12.8.1.12.DA.5

Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

Assessment

Formative Assessment

- Teacher Observation
- Daily Quick Check
- Quizzes
- Exit Tickets

Summative Assessment

- Topic Tests
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

- Follow IEP Plan which may contain some of the following examples...
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Limit number of questions
- Scribe
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video

- Practice buddy

504

- In class/pull out support with special ed teacher Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks Graphic organizers
- Vocabulary support Mnemonic devices
- Songs/videos to reinforce concepts Limit number of questions
- Scribe Manipulatives Calculators Reteach pages Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System Another look homework video
- Practice buddy

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Math Diagnosis & Intervention System

At-risk of Failure

- Additional time during intervention time
- Questions read aloud
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

Gifted & Talented

- Independent projects
- Enrichment pages
- Online games
- Leveled Homework

- Extension Activities
- Today's Challenge

Interdisciplinary Connections

ELA: NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Science: MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Climate Change:

- Climate Change: Students may relate the domain of a function $c(m)$ representing the amount of carbon dioxide produced by burning m molecules of ethane (gasoline), to its graph in order to determine the appropriate domain for $c(m)$.
- Climate Change: Students may calculate the average rate of change of a function $c(m)$ presented symbolically or as a table, where $c(m)$ represents the amount of carbon dioxide produced by burning a given number of molecules of ethane (gasoline).

21st Century Life Literacies & Key Skills

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| PFL.9.1.12.CDM.8 | Compare and compute interest and compound interest and develop an amortization table using business tools. |
| PFL.9.1.12.PB.1 | Explain the difference between saving and investing. |
| WRK.9.2.12.CAP.5 | Assess and modify a personal plan to support current interests and post-secondary plans. |
| TECH.9.4.12.CI.1 | Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a). |
| TECH.9.4.12.CT.1 | Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3). |
| TECH.9.4.12.TL.1 | Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.). |

Career Ready Practices

- CRP1. Act as a responsible and contributing citizen and employee.

- 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.
- CRP12. Work productively in teams while using cultural global competence.