Unit 04: An Introduction to Graphing (Chapter 6) Weeks 19-24

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **FY**
Status: **Published**

Standards Alignment

New Jersey Student Learning Standards

MA.A-APR	Arithmetic with Polynomials and Rational Expressions
MA.A-APR.B	Understand the relationship between zeros and factors of polynomials
MA.A-APR.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
MA.A-CED	Creating Equations
MA.A-CED.A	Create equations that describe numbers or relationships
MA.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.
MA.A-REI	Reasoning with Equations and Inequalities
MA.A-REI.C	Solve systems of equations
MA.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
MA.A-REI.D	Represent and solve equations and inequalities graphically
MA.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).
MA.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
MA.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.

CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.A.4	Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.

Interdisciplinary Connections: NJSLS for ELA, Social Studies, Science and/or Math Section

Capacities of the Literate Individual
Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language

They demonstrate independence.

They build strong content knowledge.

They respond to the varying demands of audience, task, purpose, and discipline.

They comprehend as well as critique.

They value evidence.
They use technology and digital media strategically and capably.

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media

LiteracyNew Section

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale
Unit Rationale The purpose of this unit… **Graphs are used to discern patterns that may be difficult to see when looking at a list of numbers or other kinds of data. The word graph has Latin and Greek roots and means "to draw a picture". A graph in mathematics is a picture of a relationship between variables. Graphs are used in every field that uses numbers.**

Meaning

Essential Questions

Essential Questions

-Why are the y intercept and slope so important when graphing an equation?

-What does the slope of a line indicate about the line?

-What information does the equation of a line give you?

-How are equations and graphs related?

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

-Moving from any point on a nonvertical line in the coordinate plane to any other point on the line, the ratio of the vertical change to the horizontal change is constant. The constant ratio describes the slope of the line.

-Slope can be calculated by finding the ratio of the difference in the y-coordinates to the difference in the x-coordinates for any two points on the line.

-A line on a graph can be represented by a linear equation.

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know…

-The y intercept is the point on the coordinate plane where the linear crosses the y axis.

-The slope of a line is a ratio of the change in the y values divided by the change in the x values.

-A positive slope, the equation is increasing from left to right and a negative slope, the equation is decreasing from left to right.

Skills

Skills

Student will be skilled at …

-Finding solutions for an equation in two variables

-Using ordered-pair notation to write solutions for equations in two variables

-Given the coordinates of a set of points, graph the points in the coordinate plane

-Graphing a linear equation that results in a horizontal or vertical line

-Identifying the y intercept and slope of an equation

-Using the y intercept and slope to graph an equation

-Given two points, finding the slope of the line

-Finding the slope of a line from its graph

-Writing and graphing the equation for a direct-variation relationship

-Reading and interpreting a table, pie chart, bar graph and line graph

-Creating and making a prediction from a line graph

Stage 3: Learning Plan

Resource and Mentor Texts

Resources and Mentor Texts

Beginning Algebra 8th Edition

Kahoot.com

IXL.com

YayMath.com

Kutasoftware.com

Google Classroom

Desmos.com

Graphing Calculator

Formative Assessment Strategies

Formative Assessment Strategies

-Daily Warm up problems

-Exit Tickets

-Error Analysis

-Chapter section quizzes

-IXL Quizzes

-Kahoot online review games

-Bellringers

-Homework/Classwork

Learning Activities/Unit of Study

Learning Activities/Unit of Study

-Lecture

-Stations - (Small group instruction, skills practice, online games, board work)

-Board/White Board Work - (solve problems/practice skills at board (360 degree instruction), or at seat with individual white boards)

-Technology Implementation - (Flipped learning videos to refresh skills, videos to introduce skills, prodigygame.com,Kahoot to reinforce/assess skills, online games to practice skills, utilize internet to research, review and understand skills *See resources)

-Complete problem of the day - (POD - warm-up from bellringers packet)

-Review/Check Homework - (group check, partner check, whiteboard check)

-Work together to understand and practice the skill - partner work/larger group work to read lesson, and practice skills through "On Your Own" problems incorporated throughout each lesson

-Review and practice skills using a variety of materials - (text, workbook, chromebook, games, activities, discussion)

-Student led instruction

-Error Analysis

-Thumbs up/down/sideways - quick formative assessment to gauge students level of understanding

-Exit Ticket - quick formative assessment to gauge students level of understanding

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, GIfted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of

using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.