Unit 2: Quadratic and Polynomial Functions

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Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

ALGEBRA 2, GRADES 10-12

UNIT 2:QUADRATIC AND POLYNOMIAL FUNCTIONS

Belleville Board of Education

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Unit Overview

In this unit...

- students will write and graph quadratic functions in standard form, in vertex form, and in intercept form. They will solve quadratics by factoring. They will factor using special patterns and solve quadratic equations by finding square roots. They will do arithmetic operations with complex numbers and use them to solve a quadratic equation with complex roots. They will also solve quadratic equations by completing the square and by using the quadratic formula. Finally, they will use the discriminant to predict the number of solutions of a quadratic equation.
- students will learn properties of exponents and apply the properties to expressions with zero and negative exponents. They will explore the graphs of polynomial functions, identify the real zeros of a polynomial function, and learn how to add, subtract, multiply, and divide pairs of polynomials. Students will learn how to factor a polynomial if it is the sum or difference of two cubes, or if the terms have a common factor, or if the polynomial can be rewritten as a quadratic polynomial, and they apply their experience in factoring to solve polynomial equations.

Enduring Understanding

- Understand that graphs can be used to model real-world relationships.
- Analyze and draw conclusions about graphs and what they represent.
- Use graphs to identify solutions to a variety of equations and inequalities.
- Interpret solutions to equations in terms of what they represent about the function and/or the real-world situation that the function models.
- Use different strategies and tools, including factoring, to transform and solve equations.
- Simplify numerical expressions involving exponents.
- Use the Distributive Property to simplify algebraic expressions.
- Find specific function values using equations and graphs.
- Solve quadratic and polynomial equations using graphs.
- Use complex numbers, when needed, to describe the solutions to quadratic equations.
- Simplify and solve polynomial equations.
- Use graphs to represent different types of functions including linear, quadratic, and polynomial functions.
- Use the properties of exponents to simplify expressions and solve equations.

Essential Questions

- How do quadratic functions model real-world situations?
- Why is it important to know more than one way to solve a quadratic equation?
- Why is it important to understand complex numbers?
- What can the discriminant indicate about a function?
- Why is it important to transform a quadratic graph?
- What is the difference between an quadratic inequality and a quadratic equation?
- How do the Laws of Exponents relate to the real-world?
- What does the graph of a polynomial function look like?
- What does the maximum and minimum of a graph tell you?
- What is a turning point?
- What is a prime polynomial?
- How can the remainder theorem be applied to polynomial functions?
- What is synthetic substitution?
- What is the Fundamental Theorem of Algebra?
- How do you use the Rational Zero Theorem?

Exit Skills

By the end of Unit 2, Algebra 2 students should know:

- How to determine the domain and range values of quadratic functions.
- How to analyze situations involving quadratic functions and formulate quadratic equations and inequalities to solve

problems.

- How to solve quadratic equations and inequalities using graphs, tables, and algebraic methods, including the Quadratic Formula.
- How to use complex numbers to describe the solutions of quadratic equations.
- How to determine a quadratic function from its zeros.
- How to identify and sketch graphs of parent functions, including quadratic functions.
- How to use the parent function to investigate, describe, and predict the effects of changes in a, h, and k on the graphs of the y=a(x-h) + k.
- How to use tools including factoring and properties of exponents to simplify expressions and to transform and solve equations.
- How to graph polynomial functions and determine their roots.
- How to find the relative maxima and minima of polynomial functions.
- How to determine the number and type of roots for a polynomial equation.
- How to find the zeros of a polynomial function.
- How to identify the mathematical domains and ranges of functions.
- How to determine the reasonable domain and range values for real-world situations.

New Jersey Student Learning Standards (NJSLS)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.
MA.K-12.4	Model with mathematics.
MA.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
MA.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.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.7	Look for and make use of structure.
MA.F-IF.C.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
MA.N-CN.A.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.
MA.N-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
MA.F-IF.C.7c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
MA.A-APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
MA.A-APR.B.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the

	remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.
MA.F-IF.C.8a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
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.N-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.
MA.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
MA.F-BF.A.1b	Combine standard function types using arithmetic operations.
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
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-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
MA.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, 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.

Interdisciplinary Connections

9-12.HS-ETS1-4.4.1	Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions— including energy, matter, and information flows— within and between systems at different scales.
9-12.HS-ETS1-4.5	Using Mathematics and Computational Thinking
9-12.HS-ETS1-4.5.1	Use mathematical models and/or computer simulations to predict the effects of a design solution on systems and/or the interactions between systems.
9-12.HS-PS1-8.2.1	Develop a model based on evidence to illustrate the relationships between systems or between components of a system.

Learning Objectives

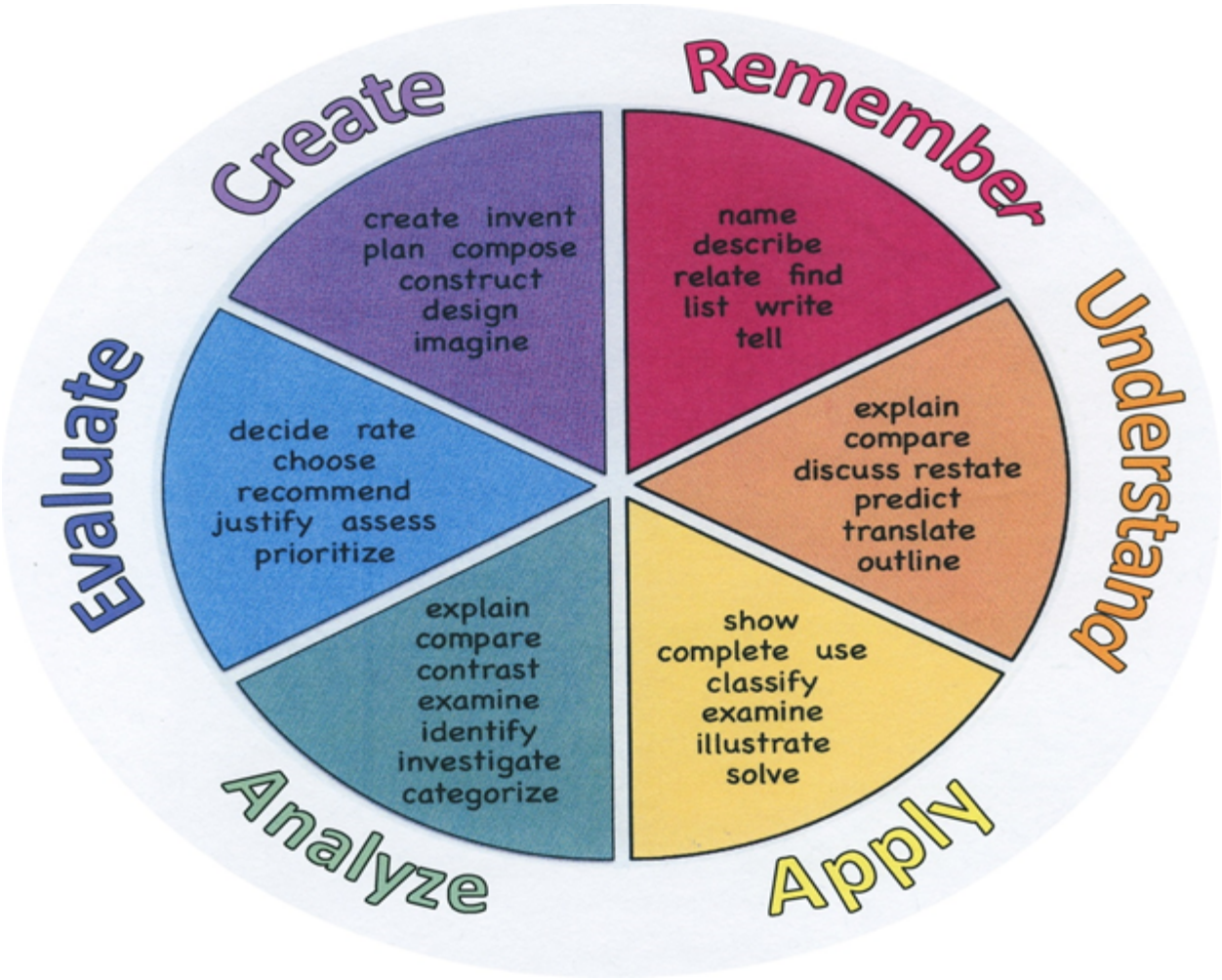
Students will be able to...

- Determine the domain and range values of quadratic functions.
- Analyze situations involving quadratic functions and formulate quadratic equations and inequalities to solve problems.
- Solve quadratic equations and inequalities using graphs, tables, and algebraic methods, including the Quadratic Formula.
- Use complex numbers to describe the solutions of quadratic equations.
- Determine a quadratic function from its zeros.
- Identify and sketch graphs of parent functions, including quadratic functions.
- Use the parent function to investigate, describe, and predict the effects of changes in a, h, and k on the graphs of the y = a(x - h) + k.
- Use tools including factoring and properties of exponents to simplify, transform, and solve equations.
- Graph polynomial functions and determine their roots.
- Find the relative maxima and minima of polynomial functions.

- Determine the number and type of roots for a polynomial equation.
- Find the zeros of a polynomial function.
- Identify the mathematical domains and ranges of functions.
- Determine the reasonable domain and range values for real-world situations.

Action Verbs: Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise
Point	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Suggested Activities & Best Practices

- Online textbook practice problems, study guides, and worksheets
- Desmos Classroom Activities, such as "Polygraph: Paraboloas" activity
- Higher-order thinking tasks, such as Illustrative Mathematics task "Choosing Windows"
- Practice activities from ALEKS, KUTA Software, Khan Academy, etc., such as "End Behavior of Polynomials"

Assessment Evidence - Checking for Understanding (CFU)

- Regular Exit Tickets to assess individual learning objectives (Formative)
- Quizzes to assess groups of learning objectives - at least one quiz for each chapter (Chapters 4 and 5) (Summative)
- Chapter Tests given at least once per chapter - at least 2 tests in this unit (Chapters 4 and 5) (Summative)
- Common Quarterly Exams - Quarter 2 Exam for this unit (Benchmark)

- Web-Based Assessments (using Google Forms, ALEKS, Edulastic, Khan Academy, etc.) (Formative/Summative)

- Admit Tickets
- Anticipation Guide
- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

- Glencoe McGraw-Hill Algebra 2 2014
- Glencoe McGraw-Hill Algebra 2 2010
- Practice Glencoe Algebra 2
- Study Guide Glencoe Algebra 2
- connected.mcgraw-hill.com

Ancillary Resources

- McDougal Littell Algebra 2 & Trigonometry 2011
- McDougal Littell Algebra 2 & Trigonometry Resource Files 2011
- Prentice Hall Algebra 2 2011
- Kuta Software

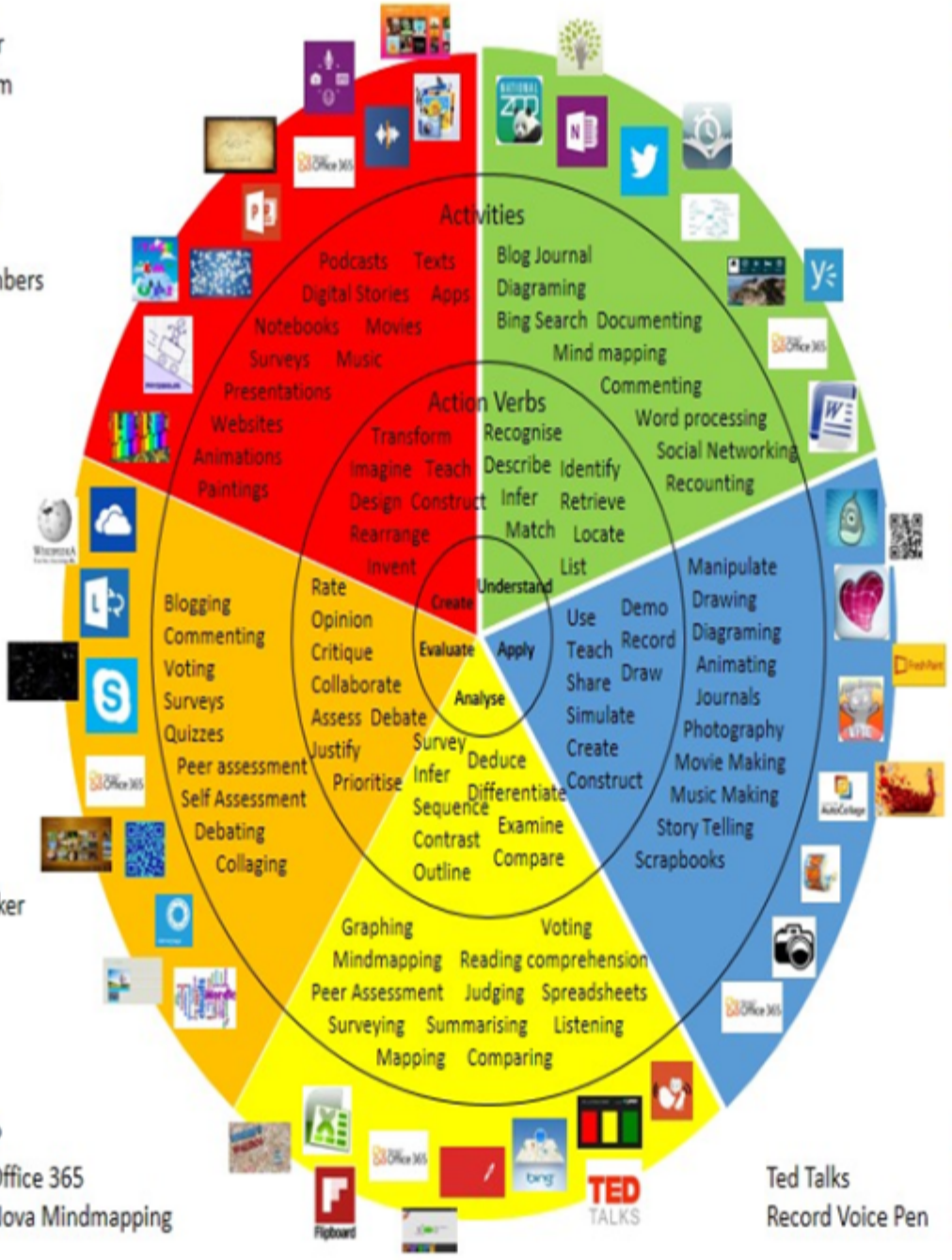
Technology Infusion

- Smart TV - Display and interact with lessons and activities
- Chromebooks - students access activities, slides, and practice problems
- Google Classroom - Slides, Forms, Drive, etc.
- ALEKS - Students practice individual learning objectives such as "Finding the roots of a quadratic function"
- Desmos - Students interact with classroom activities or use graphing software to graph and analyze quadratic and polynomial functions
- YouTube - Students watch videos to deepen understanding of specific concepts throughout the unit
- Khan Academy - Students practice individual learning objectives, such as "Factoring higher degree polynomials"
- Calculator/Graphing calculator - Students perform calculations or graph and analyze equations
- Edulastic - Students complete assessments and checks for understanding
- KUTA Software - Teacher generates a variety of assessments and practice problems for individual learning objectives or groups of learning objectives
- Pear Deck - Teacher presents information through an interactive slide show presentation

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel Office 365
Flipboard Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Alignment to 21st Century Skills & Technology

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
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.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

21st Century Skills/Interdisciplinary Themes

- Communication and Collaboration
- Information Literacy
- Media Literacy
- ICT (Information, Communications and Technology) Literacy
- Life and Career Skills
- Creativity and Innovation
- Critical Thinking and Problem Solving

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- Life and Career Skills
- Media Literacy

21st Century Skills

- Global Awareness
- Financial, Economic, Business, and Entrepeneurial Literacy
- Civic Literacy

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

- Small group instruction - Teacher utilizes small groups to remediate or enrich specific topics with different groups of students, as necessary.
- Use manipulatives - Teacher shows students how to solve equations using algebra tiles.
- Study guides - Teacher provides students with study guides prior to quizzes and tests.
- Problem-based learning - Teacher introduces topics to students as part of a project, such as creating functions to model population growth.

- Open-ended activities - Students complete activities with multiple entry points and more than one possible solution.

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products

- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

- Provide modifications as dictated in student's IEP/504 - Teacher modifies tests/assesments as necessary.
- Additional time for skill mastery - Teacher allows students additional time to master particular learning objectives.
- Center-Based Instruction - Teacher utilizes different sets of stations/centers in order to differentiate and provide students with varied learning settings.
- Modify assignments/tests - Teacher modifies tests/assesments by, for example, writing multi-part answers for questions that require students to complete multiple steps.
- Utilize computers or electronic devices - Teacher uses chromebooks and smart TV to provide students with visualizations of graphs/models and allow students to interact with them them.
- Extended time on tests/quizzes - Teacher allows students to have extended time on tests/quizzes as dictated by their IEP/504.
- Use of calculator on tests/quizzes - Students are allowed to use calculators on tests/quizzes.
- Use of study guide, reference sheets, or notes on tests/quizzes - Teacher allows students to use reference sheets or study guides on tests/quizes that contain information such as factoring rules

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding

- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

- Using videos, illustrations, pictures and drawings to explain or clarify - Teacher provides tools such as visualizations of graphs that students can interact with.
- Eliminate nonessential information - Teacher explains concepts using only the vocabulary that is essential to understand a concept.
- Tutoring by peers - Teacher allows peers to explain concepts to ELL students.
- Allow students to correct errors - Teacher allows students to gain back points by correcting their errors on a test/quiz.
- Modify assignments/tests - Teacher modifies tests/assesments by, for example, writing multi-part answers for questions that require students to complete multiple steps.
- Use of study guide, reference sheets, or notes on tests/quizzes - Teacher allows students to use reference sheets or study guides on tests/quizes that contain information such as factoring rules.

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student’s learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher’s notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test

- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

- Decrease the amount of work presented or required - Teacher allows students to submit less work, for example, only complete 3 out of the 5 practice problems for a specific learning objective.
- Using videos, illustrations, pictures, and drawings to explain or clarify - Teacher provides tools such as visualizations of graphs that students can interact with.
- Tutoring by peers - Teacher allows peers to explain concepts to at risk students.
- Providing study guides - Teacher provides students with study guides prior to quizzes and tests. For example, a variety of practice problems related to the topics being assessed.
- Allowing students to correct errors - Teacher allows students to gain back points by correcting their errors on a test/quiz.
- Allowing students to select from given choices - Teacher gives students a choice of activities to complete, such as draw a graph, create an equation, or write a sentence to model a situation.
- Allowing the use of notes, study guides, or reference sheets on tests/quizzes - Teacher allows students to use reference sheets or study guides on tests/quizes that contain information such as factoring rules.

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

- Create a plan to solve an issue presented in the class - Teacher allows students to use their understanding of functions to model a specific problem of their choosing.
- Complete activities alligned with above grade level standards - Students graph functions that are more complex, such as rational and exponential functions.

- Utilize problem-based learning for greater depth of knowledge - Teacher introduces topics to students as part of a project, such as creating functions to model population growth.
- Allow students to work at a faster pace - Teacher provides resources for students to move ahead if they are able to demonstrate mastery of learning objectives at a faster pace.

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge

Sample Lesson

Using the template below, please develop a **Sample Lesson** for the first unit only.

Unit Name:

NJSLS:

Interdisciplinary Connection:

Statement of Objective:

Anticipatory Set/Do Now:

Learning Activity:

Student Assessment/CFU's:

Materials:

21st Century Themes and Skills:

Differentiation/Modifications:

Integration of Technology: