Unit 6: Rational Functions, Expressions and Equations

Content Area: **Math**
Course(s):
Time Period:
Length: **10 classes (CP) 9 classes (Honors)**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Rational Functions, Expressions and Equations

Learning Objectives

- Objective 1 - Apply scales to graphs, origin of graph and data displays.
- Objective 10 - Identify extraneous solutions.
- Objective 11 - Sketch a graph using the key features of a function.
- Objective 12 - Interpret key features from a graph or a table of values.
- Objective 13 - Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- Objective 14 - Graph rational functions using asymtopes, holes, intercepts, and end behavior.
- Objective 2 - Use units to make sense of solutions.
- Objective 3 - Apply scales to multi-step problems and formulas.
- Objective 4 - Interpret units in formulas.
- Objective 5 - Choose units in formulas.
- Objective 6 - Choose limits on measurements when reporting quantities.
- Objective 7 - Choose the level of accuracy.
- Objective 8 - Perform operations on rational expressions.
- Objective 9 - Solve simple rational and radical equations.

Essential Skills

- Essential Skill 1 - The artist will be able to apply scales to graphs, origin of graph and data displays.
- Essential Skill 10 - The artist will be able to identify extraneous solutions.

- Essential Skill 11 - The artist will be able to sketch a graph using the key features of a function.
- Essential Skill 12 - The artist will be able to interpret key features from a graph or a table of values. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- Essential Skill 13 - The artist will be able to graph rational functions using asymptotes, holes, intercepts, and end behavior.
- Essential Skill 2 - The artist will be able to use units to make sense of solutions.
- Essential Skill 3 - The artist will be able to apply scales to multi-step problems and formulas.
- Essential Skill 4 - The artist will be able to interpret units in formulas.
- Essential Skill 5 - The artist will be able to choose units in formulas.
- Essential Skill 6 - The artist will be able to choose limits on measurements when reporting quantities.
- Essential Skill 7 - The artist will be able to choose the level of accuracy.
- Essential Skill 8 - The artist will be able to perform operations on rational expressions.
- Essential Skill 9 - The artist will be able to solve simple rational and radical equations.

Standards

MATH.9-12.N.Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
MATH.9-12.N.Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
MATH.9-12.A.APR.D.7	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
MATH.9-12.A.REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
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.C.7.d	Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

Instructional Tasks/Activities

- Academic games & Competitions
- Arts inspired projects
- Formative Assessments
- Ladder Activity
- Worksheets

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment

- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

The honors track will move at a faster pace for this unit. They will have more in depth critical thinking and analysis type questions. They will also be able to explain why there are two parts to a rational function, rewrite rational functions in different formats, and find extraneous solutions.

Resources

- https://njctl.org/courses/math/algebra-ii/