WAUCONDA SCHOOL DISTRICT 118
UNIT PLANNING ORGANIZER

Subject: Honors Algebra II

Unit: 6 Exponential and Logarithmic Functions

Pacing: 17 days

STAGE 1 – DESIRED RESULTS

Essential Questions:

- **How do exponential and logarithmic functions affect behavior of a graph?**
- **How do transformations in an exponential or logarithmic function affect its graph?**
- **How are inverse relationships used to solve equations?**

Big Ideas:

- **Exponential and logarithmic functions are closely related.**
- **Exponential and logarithmic functions behave the same as other functions with respect to graphical transformations.**
- **Inverse relationships can be utilized to solve logarithmic and exponential equations.**
- **The characteristics of exponential and logarithmic functions and their representations are useful in solving real-world problems.**

CCSS (Priority Standards):

- **A.SSE.1 Interpret expressions that represent a quantity in terms of its context. (★)**
- **A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (★)**
- **A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. (★)**
- **A.REI.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. (★)**
- **F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (★) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.**

- **F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table.) (★)**
- **F.LE.4 For exponential models, express as a logarithm the solution to abct = d where a, c, and d are**

numbers and the base b is 2, 10, or e; evaluate the logarithm using technology. (★)

CCSS (Supporting Standards):

1.

STAGE 2 – EVIDENCE

Concepts (What students need to know)	Performance Tasks (What students will be able to do)	21st Century Skills
● Exponential Growth ● Exponential Decay ● The number e ● Logarithmic Functions ● Properties of Logarithms ● Solving Exponential and Logarithmic Equations ● Modeling with Exponential and Power Functions	● Graph exponential growth functions ● Graph exponential decay functions ● Use the number e as the base of exponential functions ● Evaluate logarithmic functions ● Use properties of logarithms ● Solve exponential equations ● Solve logarithmic equations ● Model data with exponential functions ● Model data with power functions	

Common Formative/Summative Assessments:

- ➢ · Unit 6 Quiz
- ➢ · Unit 6 Test

Interim Assessments (Informal Progress Monitoring checks):

- ➢

Modified Common Assessments:

Modified Interim Assessments:

STAGE 3 – LEARNING PLAN
(INSTRUCTIONAL PLANNING)

Suggested Resources/Materials/Informational Texts

Suggested Research-based Effective Instructional Strategies

Identifying Similarities and Differences - The ability to break a concept into its similar and dissimilar characteristics allows students to understand (and often solve) complex problems by analyzing them in a more simple way. Teachers can either directly present similarities and differences, accompanied by deep discussion and inquiry, or simply ask students to identify similarities and differences on their own. While teacher-directed activities focus on identifying specific items, student-directed activities encourage variation and broaden understanding, research shows.

Summarizing and Note Taking - These skills promote greater comprehension by asking students to analyze a subject to expose what's essential and then put it in their own words. According to research, this requires substituting, deleting, and keeping some things and having an awareness of the basic structure of the information presented.

Cues, Questions, and Advance Organizers Cues - Questions, and advance organizers help students use what they already know about a topic to enhance further learning. Research shows that these tools should be highly analytical, should focus on what is important, and are most effective when presented before a learning experience

Cooperative Learning - Research shows that organizing students into cooperative groups yields a positive effect on overall learning. When applying cooperative learning strategies, keep groups small and don't overuse this strategy-be systematic and consistent in your approach.

Reinforcing Effort and Providing Recognition - Effort and recognition speak to the attitudes and beliefs of students, and teachers must show the connection between effort and achievement. Research shows that although not all students realize the importance of effort, they can learn to change their beliefs to emphasize effort.

Taken from: *Marzano's Nine Instructional Strategies for Effective Teaching and Learning*

Academic Vocabulary/ Word Wall	Enrichment/Extensions/ Modifications
Essential Vocabulary: Exponential function Base Asymptote Exponential Growth Function Growth Factor Exponential Decay Functions	

Decay Factor Natural Base e Euler Number Common Logarithm Natural Logarithm Logarithm of y with base b **Worth-knowing Vocabulary:**	