Curriculum Sample Template
Max. 8 Pages

Grade Level	High School	**Content Area**	Mathematics
Course Title (grades 9-12 Only)	Algebra II		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students know the concept of function and inverse function. Students know the meaning of logarithmic and exponential functions and their basic manipulations. Students are proficient in using their calculators to find logarithms.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	The school's program of instruction for mathematics combines an alignment with Hunter's Essential Elements of Instruction and the Socratic method as outlined and described by The Great Books program and Michael Strong's text *The Habit of Thought*. Instruction during this unit will include direct instruction of key points and examples, guided practice including practice problem sets and partner activities, independent practice, and daily formative assessments conducted at the end of each class period.		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	F-LE.4 Conceptual Category: Functions Domain: Linear, Quadratic, and Exponential Models (F-LE) Standard: #4 –For exponential models, express as a logarithm the solution to $ab^{ct}=d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.		
Materials/Resources Needed	One large (4'X8') whiteboard, one small (2'X2') whiteboard, one TI-83 calculator (minimum), two whiteboard markers, and one eraser for every two students.		

**** Standard Number**: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

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Lesson (add as needed)	**Instructional Strategies**	**Student Activities**
1	This is a 3 day lesson. Day 1 A problem such as, • Solve for *t* given the equation $100\,e^{0.05t} = 400$ will be presented to the students. Through discussion students will determine a course of action. The teacher will remind the students to focus on the isolating the variable (t) through the use of inverse operations (functions). The teacher will also lead students through the process of using their TI-83 calculators to effectively solve the equations. The teacher will evaluate whiteboard presentations for individual problems as an oral quiz to check for understanding of both the concept of evaluating logarithmic functions and use of the TI-83 calculator.	Do Now: Students will review the basic vocabulary of functions, inverse functions, exponential functions, and logarithmic functions. Guided Practice: Students (working in pairs) will discuss and determine a single (next) step to isolating the variable in the given problem. All student pairs will report their findings during a board meeting. This process is repeated for each step. Independent Practice: Each set of student pairs will be given a different problem to solve. The student pair will prepare a whiteboard with relevant details and steps. **Summative Assessment #1**: Each student will be given his/her own problem to solve on individual whiteboards and the teacher will evaluate the presentation as an oral quiz.
2	Day 2 The teacher will observe and evaluate the *Expert Talks* according to the rubric provided below.	**Summative Assessment #2**: Students will participate in four 2-minute *Expert Talks*: twice as a learner and twice as an expert. They will use the whiteboards prepared during independent practice.
3	Day 3	**Summative Assessment #3** (see Unit Quiz).

Summative Assessment Items: *Attach here.* For each summative assessment item, include an answer key or scoring rubric describing how points are to be awarded.

Summative Assessments #1 and #2 represent activities that are approved and used by the top liberal arts academies in the Phoenix area. They are designed to be aligned with the philosophy of the school and fulfill the mission of the Socratic Method which requires the active engagement of students with each other even though they may be evaluated independently. Furthermore, this style of evaluation is cross-aligned with the evaluation system used in other classes at the school, particularly Humane Letters, in order to create a consistency across the entire curriculum.

Summative Assessment #1: Oral quiz over whiteboard problems.

Skill	Points
Student accurately represents the solution to the logarithmic problem using mathematical notation.	3
Student is able to accurately and precisely use the language of mathematics to explain the logarithmic problem.	3
Student solution is correct.	2
Student is able to explain the proper procedures using a TI-83 calculator to solve the logarithmic problem.	3

Total Points Possible: 11
Mastery: 9 points (≈85%)

Summative Assessment #2:

The four "Expert Talks" will be evaluated according to the Socratic discussion rubric outlined below.

	1	2	3	4
White Board Preparation	Student contributes little to white board presentations and relies heavily on partner(s) to complete the work.	Student contributes somewhat to the white board preparation, but is unable to adequately explain the final results.	Student is actively involved in the white board preparation but struggles to provide an accurate explanation of the results.	Student actively contributes to the preparation of the white board and is able to very accurately explain its results.
"Learner" Mode for Expert Talks	Student is uncertain of what questions need to be asked and how to ask them.	Students attempts to ask questions but has significant difficulty in properly phrasing them.	Students asks good questions.	Student not only asks good questions, but leads classmates to better understanding of the material.
"Expert" Mode for Expert Talks	Student displays little understanding of white board material.	Student exhibits some understanding of white board material but is unable to clearly communicate answers to questions.	Student demonstrates competence in answering questions about white board material.	Student demonstrates a sophisticated understanding of white board material and leads the class to in-depth discussions.
Peer Interaction	Student does not engage in discussion with peers.	Student seems more comfortable speaking directly to the teacher and not with peers.	Student generally speaks to peers, but occasionally looks to the teacher for affirmation.	Student speaks directly to peers and rarely to the teacher, except when necessary.
Civil Discourse	Student is generally disrespectful of peers.	Student is respectful but can be prone to showing momentary irritation, hostility, or condescension.	Student is generally polite and respectful.	Student is exceptionally courteous and respectful even during debates and disagreements.

Total Points Possible: 20
Mastery: 17 points (85%)

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Summative Assessment #3: Unit Quiz

Summative Assessment Name_____

F-LE4

Solve each equation. Round your answers to the nearest ten-thousandth.

1) $8 \cdot e^{k} - 8 = 64$

A) 2.1972 B) 0.9542
C) 1.0882 D) 1.0322

2) $-7 \cdot e^{a} - 4 = -15$

A) 0.452 B) 0.1645
C) 0.1963 D) 0.228

3) $-6 \cdot 10^{n} + 1 = -58.8$

A) 2.4539 B) 2.6591
C) 2.2992 D) 0.9985

4) $2 \cdot 10^{n} + 8 = 69$

A) 1.4843 B) 3.1993
C) 3.4177 D) 3.0646

5) $-5 \cdot 2^{b} + 2 = -91.5$

A) 1.2718 B) No solution.
C) 2.9285 D) 4.225

6) $-9 \cdot 2^{r} - 7 = -53$

A) 2.3536 B) 1.6314
C) 0.7085 D) 1.8638

Answers to F-LE4

1) A 2) A 3) D 4) A
5) D 6) A

Each correct answer is worth 2 points.
Total Points Possible: 12
Mastery: 10 points (≈85%)

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