**Connecticut Common Core Algebra 2 Curriculum**

**Professional Development Plan**

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| **Unit 4 Rational Functions** |
| **Date:** | **Location:** |
| **Presenters**  |
| **Schedule for the day:****Start time:** 1 PM**End time:** 4 PM* + **Opening: 1:00 - 1:15 pm**
	+ **Session 1: 1:20 - 2:00 pm**
	+ **Session 2: 2:05 - 2:45 pm**
	+ **Session 3: 2:55 - 3:35 pm**
	+ **Closing: 3:40 - 4:00 pm**
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| **Opening Session**:Overview of Unit 4 on Rational Functions. * Direct and indirect (inverse) variation
* Power Functions
* Why the graphs of some rational functions have a horizontal asymptote and what that means about the end behavior of the graph.
* Why the graphs of some rational functions have a vertical asymptote and the relationship between a small change in input and the change in output near the asymptote
* Equation of a horizontal or a vertical asymptote.
* Algebraic methods to solve rational equations
* Extends the properties of equality to include multiplying by a variable expression
* Requires students to explain how extraneous roots can occur
* Connects solving rational equations to other topics such as proportions

 **Power Point to introduce Unit 4.**Have each teacher write suggestions for improving the curriculum on 3x5 notecards to be handed in at the closing session. |
| **Workshop 1** | **Presenter:** |
| **Activities:** 4.1.1 Inverse Square Law of Light Brightness and Distance from Source Lab will require students to model a light experiment with an equation of the form f(x) = kx-2 and will require them to study the graph and make observations about the behavior of this function. They will also need to determine the model.Discuss the teacher notes and the advantage of having the boxes prepared ahead of time | **Equipment and Materials**1. **PowerPoint introducing activity**
2. Hard copies of Activity 4.1.1 and Teacher Notes for 4.1.1 and Activity 4.1.1ans for each participant
3. Shadow boxes
4. Mini Maglite flashlight—regular flashlight will not work
5. Transparent tape
6. Centimeter Rulers
7. Graph paper—see the student copy for the template
8. Calculator for basic arithmetic operations
9. 3x5 notecards – 5 per person for suggestions
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| **Workshop 2** | **Presenter:** |
| **Activities:** 4.1.7 Gathering Data on Wingspans and 4.2.1 Analysis of Bird Data Students should come to class with the names of their birds, the average weight for the species and its average wingspan from Activity 4.1.7Gathering Data on Bird Weights and Wingspans. For this workshop provide data forParticipant. They can then put the data in lists L1 and L2 of a TI 83/84 or equivalent graphing technology. Have participants alone or in pairs make a scatter plot on their grapher to assess whether the data is linear or not. It will not be linear and they should then consider what smooth curve could be used and which family they have studied can be used to model the data. The power family hopefully will be the ultimate choice and a power regression determined. | **Equipment and Materials**1. **PowerPoint introducing activity**
2. Hard copies of Activity 4.1.7 and 4.2.1 for each participant
3. Some data to use as an illustration—provided in answer key
4. 3x5 notecards – 5 per person for suggestions
5. TI graphers or software with spreadsheet and regression capabilities
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| **Workshop 3** | **Presenter**: |
| **Activities:** 4.5.1 Solving Rational EquationsPost signs with the equations before participants enter the roomView the film clip on the power pointHave a little race—first student to solve all the problems gets a little prize. Students can solve any remaining problems for homework.  | **Equipment and Materials**1. **PowerPoint introducing activity**
2. Tape to place the equation sheets around the classroom
3. Sheets with 1 problem and 1 answer per sheet to place around the classroom
4. Grapher
5. Activity 4.5.1
6. 3x5 notecards – 5 per person for suggestions
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| **Closing Session** Project some assessments (mid-unit and end-of-unit) for units 1 – 4 on doc camera or overhead projector and discuss. Point out the assessment checklist so teachers can make equivalent substitutions if they wish. Also tell them about the test bank and midyear test bank.Address remaining comments from stickie notes and note cards about the curriculum. Ask for questions and input from teachers about their experiences during the day. |
| **Additional Comments**  |