

Essay Questions for Teachers' Qualitative Conceptual Models

Part 1: Work with a partner to use your model to explore the questions below that will be addressed in your written essay. To be able to respond to these questions, you and your partner both need to have completed your own conceptual models about your research project. For each question, first think about and jot down your ideas, then each take a turn to describe your response to the other. As you get additional ideas, write them down too.

Part 2: After discussing your work with a partner, write an essay that responds to the following questions. Please put your name on the essay.

- 1- Explain why you chose each component depicted. Describe the relationships among all of your components. Explain what is going on. What ecological process or processes does your model best depict?
- 2- Using the components in your model, re-write or refine your initial research hypothesis. Describe how you would test this refined hypothesis in a subsequent experiment.
- 3- *(If your experiment includes Organisms)* Choose one of your biotic components in your model. List or describe as many sub-components (species) within that. Could any of those components be redundant? Explain why or why not.
- 4- Discuss and illustrate each of the following
 - a) Show feedback.
 - b) Choose one component in your system and describe one change over a short-term period of time. Describe any indirect effects you can expect due to this change.
 - c) How could the patterns in your system appear differently over a longer time scales?
- 5- Add a specific appropriate disturbance (e.g., fire, grazing, drought, development, invasive species). Can you predict some of the consequences of this disturbance on the system being studied? Design an

experiment to test whether or not your prediction is accurate and under what conditions.

- 6- Based upon your current understanding of the system you have depicted, how do you think complex ecosystems function? Explain your reasoning.