Final *integrated* **project / lesson plan** (teams-Due: Thursday, August 12th)

Submit as hard copy AND electronically through ANGEL

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Grade level(s)/Subject taught: 8th grade integrated

Objectives: Students will be able to:

- Identify locations of objects using the Cartesian coordinate system.

- Use agent sheets to modify a pre-existing computer generated model.

- Formulate and test hypotheses related to wildlife populations and carrying capacity.

- Describe the significance of carrying capacity.

Describe the *integrated* Mathematical - Science Concepts or "key ideas" that modeling will be used to teach: (e.g. Students use mathematical modeling/ multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships and… Organisms maintain a dynamic equilibrium that sustains life).

Mathematical - Science Concepts to be integrated:

Students use critical thinking skills in finding the solution of mathematical problems.

Students use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.

Students will access, generate, process, and transfer information using appropriate technologies.

Mathematics, Science, and Technology Standards 1, 2, 3, 4, 5, 6, 7
All Standards will work for our project.

For your *integrated* **project / lesson plan)** lesson (team effort), describe how you plan on using a desired modeling software package(s) with your students AND how you might integrate or weave together the two (or more…) math and science concepts into one or more lessons. You might describe what a visitor might see walking into your classroom during this lesson. You might also describe the role of the student during the entire lesson and your role as the teacher. Please try to be specific as possible. Also, construct a tentative rubric that you might use with your students. ** see example page 5.

Prompts:

1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions and Student Actions
4. Describe your thinking of how the concepts will be integrated.
5. How will you assess the learning for the lesson?
6. How will the chosen software/tool(s) be integrated into our teaching as per rubrics in this packet? (i.e. you may want to discuss a problem or describe how you might use the chosen modeling package in your plan. How does the model/tool help the concept(s) to be taught)?

This culminating lesson will take place over many class days. Using Project Interactivate, Agent Sheets and Geometers Sketch Pad, we plan on having our students view a model on Project Interactivate, manipulate Agent Sheets and duplicate a symbolic habitat with Geometer's Sketch Pad. Students have had many lessons throughout the school year in their science and mathematics classes. These lessons have focused on the use of the above software and technology. Students are familiar with the technology to operate each tool. This project is a culminating activity to finish the school year. Students should have accumulated prior knowledge over the course of their math and science lessons. Teachers will show the Rabbits and Wolves activity from the Project Interactivate web site using the LCD projector; students will observe/take notes and discuss how a simulation can show the balance of rabbits and wolves in a natural setting. A discussion focusing on the population graph (plot), the relationship of the carrying capacity and the number of rabbits and wolves that can be supported in that particular environment will take place between students and teachers and students and students. A new environment, although similar in theory will be introduced with Agent Sheets. The task is for the student to determine how many deer (replacing rabbits) and wolves a new environment will support. Students will work independently using Agent Sheets to manipulate a new deer and wolf environment. Students will manipulate the variables to determine what the population of deer and the population of wolves would be in that particular environment. Each student will chart a Cartesian graph showing the starting points of each experiment and the numbers of animals in each quadrant with recorded observations. Teachers will distribute a worksheet to record individual observations on. A whole group discussion will compare different student findings and observations made. Students will use Geometers Sketch Pad to draw the boundaries given for their habitat from the deer and wolves Agent Sheets. Using Geometers Sketch Pad, students will create the accurate scaled representation of perimeter and area for the deer and wolf habitat. Students will be responsible for handing in a culminating portfolio which will include: hard copies of Agent Sheet trials (including observations), Geometer's Sketch Pad work, and a written reflection of the students experience using technology in each classroom-math and science. Mathematics and science teachers will equally be responsible for assessing each student portfolio using the following rubric:

	Below Average	Satisfactory	Excellent
Has clear vision of final product	1	2	3
Properly organized to complete project	1	2	3
Managed time wisely	1	2	3
Acquired needed knowledge base	1	2	3
Communicated efforts with teacher	1	2	3
Format	1	2	3
Mechanics of speaking/writing	1	2	3
Organization and structure	1	2	3
Creativity	1	2	3
Demonstrates knowledge	1	2	3

Comments: