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Evolution of a River Using AgentSheets

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CMST Lesson Plan Agent Sheets

Grade level: 8

Math Objective: Students will be able to use Agent Sheets to calculate the time an object will take to travel down a simulated new river and a simulated old river.

Science Objective: Students will use Agent Sheets to simulate the evolution of a river.

Technology Objective: Students will learn to create an Agent Sheet using the evolution of a river as their topic.

Materials: Agent Sheet Program
Calculator
Portable laptops
Handouts

Math Standards: HYPERLINK http://www.emsc.nysed.gov/3-8

8.PS.11 Work in collaboration with others to solve problems

8.RP.2 Use mathematical strategies to reach a conclusion

8.CM.3 Organize and accurately label work

8.R.8 Use representation as a tool for exploring and understanding mathematical ideas

Essential Question: What differences exist between the various stages of a river?

Prior learning: Students will work on this project as they are studying the evolution of a river in their earth science unit. Students will have worked on various problem solving exercises in their mathematics classroom. Students will have used Agent Sheets to create simple scenarios in which they use behaviors and actions via the creation of if, then statements.

Launch: Teacher has students define a simulation. Discussion occurs as to how simulations are useful. The teacher will demonstrate his/her Agent Sheet simulations of the stages of a river. Teacher stresses that he/she made the simulation to determine how long it would take toxic waste dumped in a river to reach the lake.

Explore: Students will be challenged to create a similar river simulation using their knowledge of the evolution of a river. They will be given the following guidelines:

- A story must be written explaining what was dumped in the river and why it is important to determine how long it takes to reach the lake.
- Each student must choose one stage of a river and create that stage in Agent Sheets. Students will be encouraged to make realistic simulations containing obstacles and floating objects as an extension.
- Each student will be expected to determine the average rate at which an object will travel down their river model.
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The teacher facilitates the student learning working individually and in groups with the students.

Summary: Each student will present his/her work.
Students will discuss the relationship between flow rates and physical features of rivers as well as the relationships with these features and the speed at which something travels down a river.

Assessment: Rubric for task
Presentation rubric
Student evaluation of the task. (Frayer)

Homework: Word problems of applications of average rate

Rating Task	**5** Completed the task	**4** Completed most of the task.	**3** Completed some of the task.	**2** Completed very little of the task.	**1** Did not understand the task.	**0** No attempt.
Using Agent Sheets	Understands how to use the and helps others	Understands if, then statements and can create basic Agent Sheet simulation	Shows some understand-ing of how Agent sheets work.	Shows little or no understanding of Agent Sheets, yet does create if, then statements	Creates if, then statements	No attempt.
Assistance	Required no teacher assistance.	Required very little teacher assistance.	Required teacher assistance 25% of the time spent on task.	Required teacher assistance 50% of the time spent on task.	Required teacher assistance 75% of the time spent on task.	Required constant teacher redirection and assistance.
Participation	Student remained on task throughout the class.	Student remained on task for most of the class.	Student was on task less than half the class but did ask questions.	Student was on task less than half the class.	Student was not on task most of the class and did not ask questions.	No attempt to work.
Computation	Computations are correct more than 95% of the time.	Computations are correct 85% to 95% of the time.	Computations are correct 75 to 85% of the time.	Computations are correct 65 to 75% of the time.	Computations are correct less than 50% of the time.	Little or no attempt to show computations.