

Lesson Outline

Teacher Name Dan Pellis
School Quaker Valley Middle School
Course Title Physical Science
Topic/Unit Rate of Reaction
Model Topic Interactive Graphing
Modeling Tool Excel

Please provide a brief description for each section.

1. Describe the preparation you will do with the students prior to the model.

Generally, I will ask students to give me several examples of chemical reactions. Students will be given time to share their ideas and to listen to the examples of other students. Towards the end of the discussion, I will mention that all of their chatter has given me somewhat of a headache, and I will drop an Alka-Seltzer tablet into water. I will then ask the class if they think that the tablet is reacting with water and if so could we use it to test our ideas? Furthermore, I will challenge the class to imagine that they were on teams competing in a chemical reaction race. Each team will be asked to design an experiment to determine how changing one condition about the alka-seltzer tablet or the water may increase the rate at which it reacts. They will in turn use general lab equipment to test their hypothesis. (Since students will suggest variables such as temperature, amount of water, surface area, etc. it will be necessary to construct more than one spread sheet to meet the variety of possible independent variables suggested. For time purposes, I will only demonstrate the spread sheet needed to analyze temperature.)

2. Describe the learning objectives related to the model and how you will achieve them.

Students will state the problem, formulate a hypothesis, design an experiment, collect and process data, state their conclusions (including an evaluation of their procedure).

3. Describe the discussion questions you will use after the model.

After viewing the interactive Excel spread sheet provided, students will be asked to view the series of data points generated by their experiment and speculate on a line of best fit. They will compare their line of best fit to that which is produce by the computer. In a follow-up experiment, students will be asked to pick a data point found on their line of best fit and conduct a **second** experiment to determine if the results suggested by the graph enable them to accurately predict reaction rate based on the new water temperature.

4. Describe the type of student assessment you will use.

Student assessment will be based on;

The accuracy of their written documentation ie. Lab Write-up.

The ability to test one variable while controlling a variety of other conditions.

Their ability to accurately evaluate their own experimental procedures.

The ability to work safely and cooperatively in the lab.