

10-1992

News from the J. Joseph Moakley Center for Technological Applications

Follow this and additional works at: https://vc.bridgew.edu/br_rev

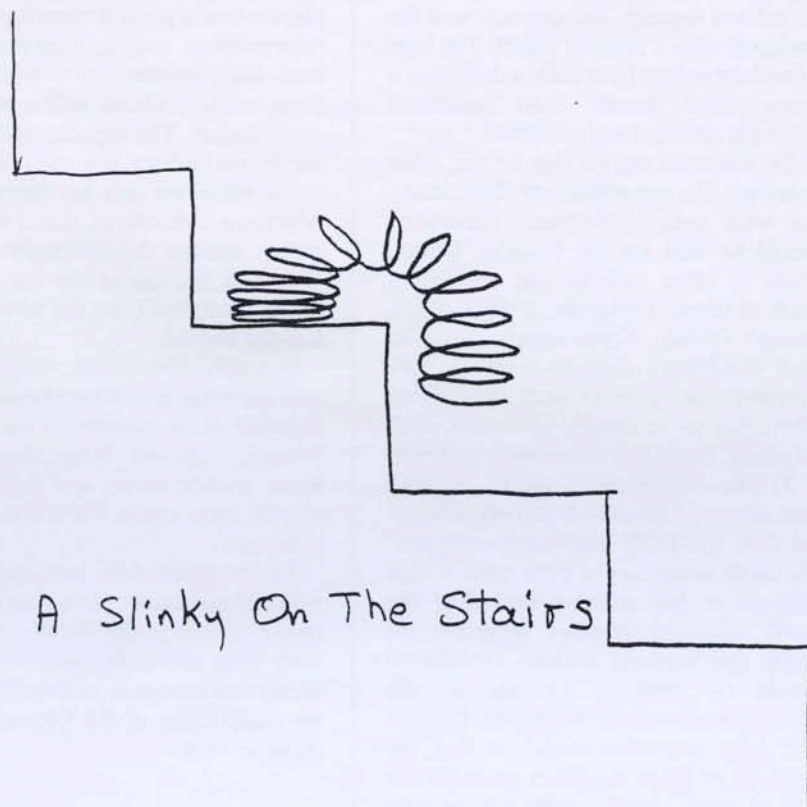
Recommended Citation

(1992). News from the J. Joseph Moakley Center for Technological Applications. *Bridgewater Review*, 10(1), 25-26.

Available at: https://vc.bridgew.edu/br_rev/vol10/iss1/13

This item is available as part of Virtual Commons, the open-access institutional repository of Bridgewater State University, Bridgewater, Massachusetts.

News from the J. Joseph Moakley Center for Technological Applications



A Slinky On The Stairs

This is the first in a continuing series of reports on the J. Joseph Moakley Center for Technological Applications, focusing on the involvement of Bridgewater faculty members. In this case, the faculty member is Wilmon Chipman of the Chemistry Department. He has been involved in helping to plan for the educational design of the Center. After hearing Dr. Chipman on the subject, I think it best to start with a feeling for the scale of the project.

If you have ever been involved in the building of a home you know how involved it can be. What will the design be? How many rooms will there be, how large, for what purposes and how will they be arranged? You get the idea. Now, because the Moakley Center is a ten million dollar project, just multiply the complexity of planning this project by a factor of about 50. In this report we will focus on only one aspect of the center.

One of the critical parts of the Moakley Center will be the four electronic classrooms. In its simplest form, an electronic classroom is a room with some sort of projection system connected to one or more computers. There are two types of projection systems available now. One is the projection television, like the ones used in large halls or sports bars. These can be used in classes as huge computer displays of what the instructor is doing on his or her computer. The liquid crystal display (LCD) panel projector also allows a teacher to work at a normal computer and project what is on the computer's screen. However, in this case the image from the computer display is projected onto the usual screen at the front of the room. The critical equipment here is the liquid crystal display panel, a flat glass box about one foot square which plugs into the computer and repeats the computer screen display. When light is shined up through the panel and onto the film screen, the display is easily seen even in a large auditorium. With either technology only one computer is needed for the instructor.

If it is not immediately obvious to you what value this might have for a teacher, especially one who teaches organic chemistry as Dr. Chipman does, consider the following problems. I once tried to describe to a visitor from Buenos Aires, how a Slinky works. She had never seen one and what was so easy for me to visualize was impossible to convey to her. My drawings on placemats were laughable. (Before you begin laughing, try it.) And for those who have no idea what Slinky is, imagine explaining to someone how to set a digital watch, or operate a video game joy stick or get anywhere on a windsurfer. Nothing beats "hands-on" teaching in such cases. However, teachers of organic chemistry face just such a barrier with an added twist. Molecules are too small to see. The three-dimensional models of molecules constructed of Lego-style parts are fragile and cumbersome to construct. And two-dimensional pictures, such as the one reproduced here, even when in color, do not permit the student to see the molecule from enough angles to understand its structure. A Slinky, after all, is

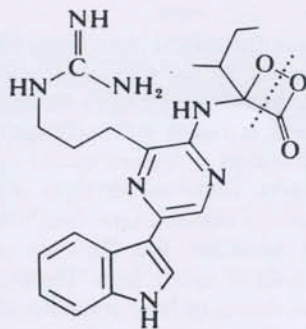


Figure #1

Diagram of an oxidation product of a molecule isolated from the sea pansy: It explains the real molecule about as well as my picture of the slinky on the stairs explains the real thing.

certainly not like its two-dimensional drawing. But computers allow even the most complex structures to be depicted in color and, with the more powerful and sophisticated machines and programs, to be rotated through 360 degrees, as if the molecule were a physical object. The level of understanding from such a depiction is many times greater than traditional teaching devices have permitted.

Dr. Chipman reports that he and other members of a committee have been studying what sorts of electronic classrooms would be best for the Moakley Center. Visits to other colleges and universities such as Brown University, Colby College, Boston College, Northeastern University and Middlebury College seem to have revealed five types of such classrooms. Here they are in roughly increasing order of power, control of information and cost.

1) The "minimalist" model employs one advanced Macintosh and one advanced IBM (MS-DOS) type micro-computer. By using computers of both types a high percent of the software (including the most advanced graphics programs for study and teaching a range of subjects) would be available for use in the minimalist classroom. Among the limits of this least expensive model, is that the capacity of these machines preclude the use of more complex software, such as might be used in the teaching of organic chemistry. Also, the computers are not linked together, so centralized control or information sharing are not possible.

2) The "industrial" model uses a single mini-computer, which has a great deal more power than a micro, to connect and control a network of other equipment. Such equipment may include a mix of micro-computers, terminals (which are simply display screens running off the mini-computer) and work stations, (very compact, large capacity computers). The advantage of this model is its flexibility. The mini-computer can drive and interconnect a range of equipment.

3) Roughly equal to the "industrial" model in cost and power is the "standard" model. It is essentially the minimalist model with approximately 15 micro-computers linked together in a network. This model is called "standard" because it is currently the most widely employed in

college and university settings.

4) The "maximalist" model adds to the "standard" model the centralized control of screens for all the equipment in the room. So, the instructor may, for example, see how a given student is progressing on a problem, and can even make suggestions and corrections or alter the assumptions of the problem in the middle of a work session. The capacity of the instructor to orchestrate the class in this way (some would say spy), has raised the issue of privacy. One college visited by the committee rejected the maximalist electronic classroom because of this capacity, while another adopted it for the very same centralized control.

5) Lastly, the "work station" model uses approximately 15 workstations linked together in a network. This extremely powerful, high end, design allows for maximum analytic power and flexibility. It is also the most costly. But it is the model of the future.

The selection of the best model of electronic classroom for our needs and for the projected uses of the Moakley Center will have long term consequences. We will report in a later issue on this decision, and on other facets of the Center's development and use.