

Student Use of Microsoft Office in a First-Year Chemistry Course

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Abstract

Our first-year students use almost all of the applications in Microsoft Office. From writing lab reports in Word, graphing for math and chemistry labs in Excel, presenting their research project using PowerPoint, documenting their research project on the Web with FrontPage, and managing their emails with Outlook, the students become well-versed in using this versatile package. We will explore the different assignments given to the students and the Microsoft Office applications needed to complete them, as well as look at some other possible uses for the various programs in this software package.

Introduction

First-year students at the Roanoke Valley Governor's School are mostly freshmen and sophomores. While many have had some exposure to Microsoft Office programs, few have an in-depth knowledge of the programs, and most of their experience is in using Word and Excel. Through the four courses they take (Governor's School Chemistry, Integrated Mathematics, Fundamentals of Research, and Computer Applications and Technologies) they acquire a thorough knowledge of all but Microsoft Access.

Classes and Applications

Students in Chemistry submit some lab reports as Word documents (the rest they fill out in their laboratory notebooks). In these lab reports, they must often include tables for their data and their calculation results, and import Excel graphs of their data into their documents. Excel is also used for the graphical representation of data in some notebook lab reports (where it is taped in), and for the determination of the equation for linear relationships. In the Melting/Freezing Point Lab, students are required to plot two data sets on one graph, and to draw a horizontal line from the intersection of the two curves in order to determine the experimental melting/freezing point (see Fig. 1).

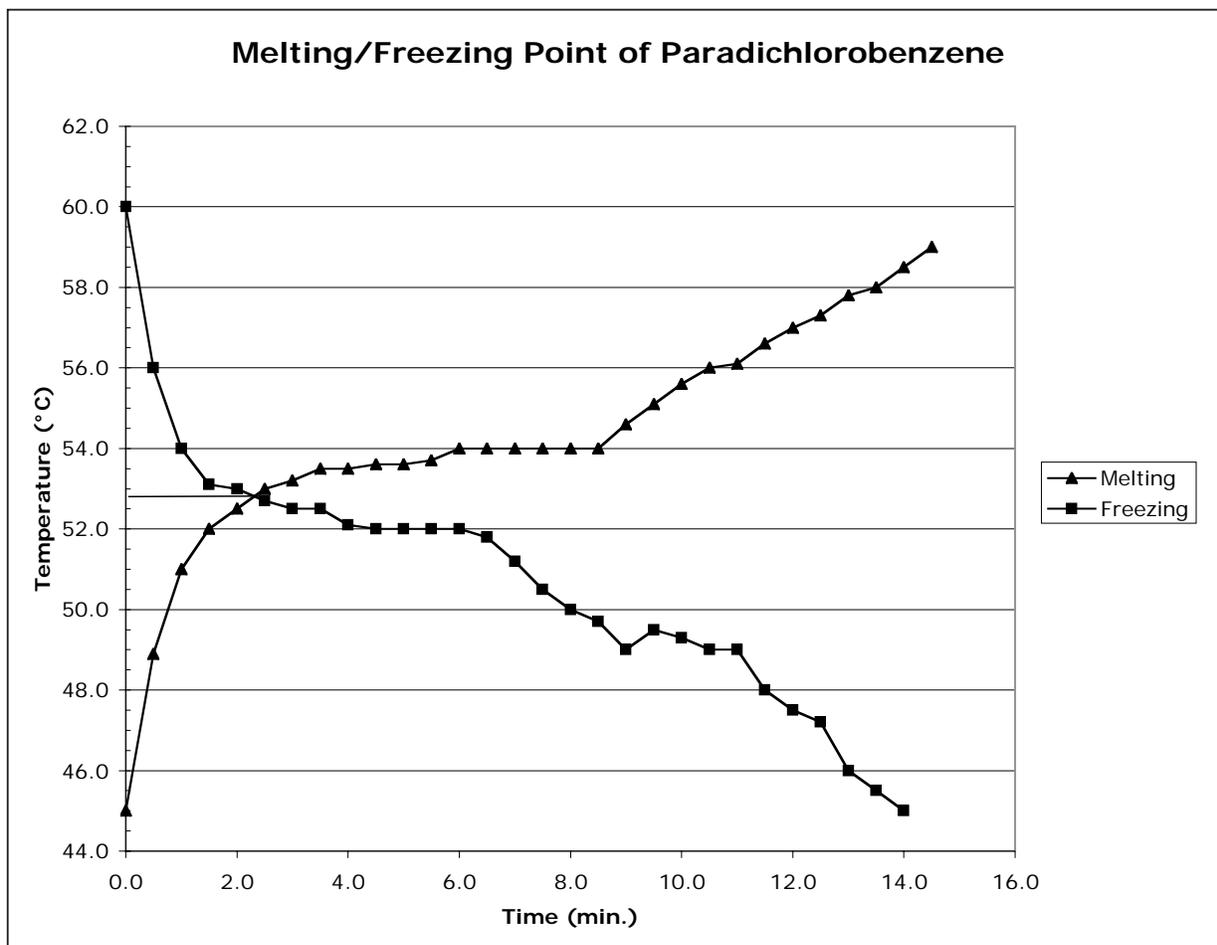


Figure 1

Students are also assigned a group project on one family of elements during the unit on the periodic table. The project includes a PowerPoint presentation that must be a minimum of five slides in length. Since few students have had much experience with PowerPoint at this stage, the presentations are not expected to be very sophisticated or polished.

Fundamentals of Research is the class in which students design and carry out a research project of their own choosing. After their research is completed, they must put together a research paper that includes the following sections: abstract, introduction, methods and materials, results and conclusions, bibliography, acknowledgments, and appendix (with imported graphs from Excel, LoggerPro, and/or Minitab). Later in the course the students must present their research project to the class using PowerPoint slides that incorporate photos of their project (see Fig. 2). (At this point, their presentations are expected to be much more professional than their family of elements project was.) And, as a final project, they use Microsoft FrontPage to design a website that describes their research and its results, and includes a link to their research paper saved as a PDF file.

Conclusions...

- The Ground Hulls, Soaked Hulls, and Ground Leaves samples had averages less than the control
- The One-way ANOVA test showed that these samples had data sets that did not overlap with the control's data set
- T-tests resulted in p-value of less than 0.05 showing significant difference

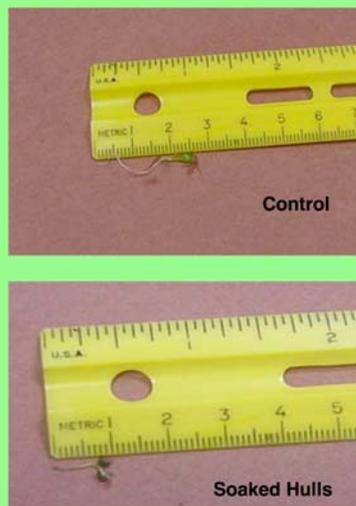


Figure 2

Computer Applications and Technologies is the class where students are given in-depth assignments using Microsoft Office applications, along with other programs such as Minitab, LoggerPro, Visual Basic, and Photoshop Elements. When possible, these are done prior to similar assignments in Chemistry, Integrated Mathematics, or Fundamentals of Research. Students in this class also learn to use Microsoft Outlook to manage their school email accounts.

Discussion

After their first year at the Roanoke Valley Governor's School, students are well equipped to handle a wide variety of assignments that utilize Microsoft Office applications. The only significant application not used is Access. It would be great to be able to give them experience with database management; however, time constraints at this point do not allow us to incorporate that application.

In the future, more elaborate projects using applications from Microsoft Office may be incorporated into the chemistry class. For review, students could be assigned a group project to create a PowerPoint slide presentation similar in format to the game show Jeopardy - this would hone their PowerPoint skills while they check their understanding of chemical concepts. Students could also be assigned to set up and solve several problems and show their work on a web page that they design (which would become part of a class website).