

Summerscience: An Enrichment Program for Eighth Grade Girls

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Summerscience is a two week residential summer science enrichment program for girls entering the ninth grade. The program is conducted by The University of Michigan Women in Science Program of the Center for the Education of Women (CEW) in collaboration with the College of Literature, Science and the Arts Chemistry and Physics Departments, the School of Natural Resources, the College of Engineering, and the UM Information Technology Division. It is funded by the Young Scholars Program of the National Science Foundation and NASA.

The overall goal of summerscience is to demonstrate to young women, at a critical junction in the high school curriculum selection process, that science and mathematics can be exciting, fun, challenging and rewarding. Immediate objectives of the program are to provide the participants with hands-on experiences in selected fields; to expose them to the working world of a research scientist at a major research university; to illustrate how science is practiced; to build the students' confidence while permitting them to access their own talents; to introduce them to the enormous variety of careers in science, mathematics and engineering; to assist them in academic planning at both the high school and college level; to introduce them to women and minority role models; and to allow them to interact with girls of their own age with similar interests.

This year, seventy-six students were selected from across the state of Michigan. Special emphasis was given to the recruitment of minority and disabled girls. Application forms were sent to science department chairs and counseling department heads of every intermediate, junior or middle school in the state. As an indication of the demand, we received over 400 applications for our 76 positions. Approximately 40% of our

students are African American, Hispanic or Native American. This year we will also have three hearing-impaired students.

Students are selected on the basis of interest and aptitude in science and mathematics, as indicated by grades, courses taken, and extracurricular activities in science. This does not eliminate many of them. In addition, we look at the occupation and educational level of the parents. Because we have such an enormous number of applicants, we attempt to select girls who would benefit the most from this experience. All other things being equal, we try to select the student who lives in a rural district such as the upper peninsula with little access to science museums or programs. We try to select the student who will be the first generation college student in her family. We try to select the student who comes from a family of non-scientists, etc. We also try to select as diverse a group as possible, in terms of geographical location, small school vs. large school, rural vs. urban vs. suburban school district; and ethnicity.

All students select a focus project in one of five areas: chemistry, engineering, natural resources, physics, or space science. Students spend three hours a day, for the two week period, working in their focus project area doing hands-on experimentation and small research projects. For instance, students in electrical engineering build a digital alarm clock, using soldering irons that they get to take home. Students in natural resources take water samples from the Huron River and analyze them. Students in the chemistry department perform simple experiments in organic chemistry and also build molecular models.

In addition, all students participate in a computer project daily involving a basic analog to digital converter used to gather data from a simple sensor and convert it to numerical information more suitable for analysis. Students gather data on light, temperature, weight, distance and time. After gathering data, students use common graphics programs to graph the data. Students are able to take the analog to digital converter back to their school, install it in their science laboratories and instruct others in its use.

An electronic conference system using the Michigan Terminal System is also established for the students, summerscience staff, and interested women science faculty members. Conference participants discuss such issues as whether or not boys are really smarter in math or sexist experiences in the classroom.

Students also participate in a field biology trip, a mathematics program, and a field trip to a science and technology museum. One evening, we rent our local Hands-On Science Museum and have it all to ourselves.

Evening sessions are devoted to career panels in chemistry, geology, science teaching, engineering, biology, mathematics and physics. Students view the "Women in Science Videotape Series", and then have an opportunity to talk with women scientists in each area.

The philosophy and ethics of science is discussed in two evening sessions and is also incorporated into the daily focus project activities. In order to relate ethical concerns to the day to day world of the students, the major focus is on ethical issues of concern to inhabitants of the Great Lakes states.

All students participate in exit interviews and agree to participate in follow-up activities at their schools involving an oral presentation about their summer experience and installation of their analog to digital converter. The Women in Science Program maintains contact with the students and their science teachers and will follow their high school academic progress. In addition, career information and bibliographies is provided to both the students and their schools' libraries. A newsletter is sent to all participants on a regular basis.

It might be helpful to share a few pointers that we learned "on the job" last year. It is very important to appreciate the adolescent development issues of 13 year old girls. We found that consultation with faculty in the school of education and middle school teachers to be invaluable. Everything must be hands-on. Even though this might seem obvious, it even extends to the career panels that we conducted. Career panels of women scientists, who discuss how they became interested in science, what it was like going to school in science and what they do in their professional lives work very well with girls in their junior or senior year. They did not work as well for our younger girls. They did not seem to want to listen. This year we plan to incorporate some of the EQUALS career development activities into the career sessions. We also plan to incorporate some discussion of racism and sexism into our program this year. We had not originally included it since we did not want to discourage them, but it is apparent that many of them have already encountered both racism and sexism in their science education.

Because of the young age of our participants, they are escorted by student leaders everywhere they go on campus. The student leaders are women undergraduate and graduate students

who are majoring in science, engineering or mathematics. One third of the leaders are women of color. Our participants become very close to their student leaders - they are together 24 hours a day. They are excellent role models.

Summerscience serves as a model project which we believe can be developed into similar annual programs supported by participant fees and industrial contributions. It will also provide a model for the development of related programs such as computer camps. It is a rich and rewarding experience for all involved - students, student leaders, faculty and staff.