

DESIGN AND DISCOVERY

Parent organization: Intel & Girl Scouts Columbia River Council

Web address:

http://www97.intel.com/discover/DesignDiscovery/DD_Research/default.aspx

<http://www.engineergirls.org/>

<http://girlscoutscrc.org/>

Grade level or ages served: Girls must have finished grade 6 and not graduated high school. Typical grade range is 7 – 10.

Overview: *Design and Discovery* is an inquiry-based, hands-on design and engineering curriculum intended to encourage and enhance middle school girls' and boys' experiences in design, engineering, and technology. The program was originally intended for girls. The factors that research has shown to have a positive impact on all students' continuing involvement with science, engineering, and technology include:

- Interactive, collaborative, and team-based environments that offer the opportunity to work on real-world problems.
- Exploratory environments that say it's OK to ask questions, take risks, and make mistakes.
- Hands-on, inquiry-based activities to foster knowledge, skill development, experimentation, and creativity in the areas of science, engineering, and technology. Inquiry-based instructional approaches place students at the helm of the learning process and teachers in the role of learning facilitator, coach, and modeler. Skill development leads to competence and self-confidence.
- Career exploration through real-world science and technology experiences including after-school science programs, field trips, conferences, science fairs, and internships. Real-world experiences provide awareness of career opportunities in the fields of science, engineering, and technology.

Subjects covered: Include electrical circuits, transfer of energy, materials, force and motion, and mechanics. Emphasis is on using the design process to solve a problem from the participant's real life.

Size of program: In Oregon, the program has grown from a single day camp in 2002 to four sessions in 2004 (60 girls). Four programs were planned in 2005 but because of management issues, only two ran: 17 girls in day camp, 6 in resident camp. Four programs are planned for 2006 (resident camp, Vancouver day, Portland day, and the Destination (which covers girls around the country).

About 25% of the girls do a science fair project of some kind, usually competing at school. Last year, only 5 girls went to ISEF-affiliated fairs; one went to ISEF as an alternate.

Columbia River Council is, as far as is known, the only group offering Design and Discovery in Portland.

Where offered: In metropolitan Portland, this program is offered by the Girl Scouts Columbia River Council: www.girlscoutscrc.org. Because the curriculum is downloadable, there is not a mechanism for tracking who has used it.

Time spent by students: The Girl Scouts offer a two-week Day Camp, a resident camp, and open-ended follow up with a mentor for working on ISEF projects.

Partners/Sponsors: Girl Scouts, Lockheed Martin, Intel, the US Department of Education, and the SWIFT foundation. WSU-V and PSU donated space and computer time.

Materials available on web and/or purchase: The Curriculum (Facilitator Guide, Student Guide), Implementation, and the Supply List can be downloaded as PDF documents and printed:

http://www97.intel.com/discover/DesignDiscovery/DD_Curriculum/default.aspx

These 18 curriculum modules can be used in class, after-school, or camp delivery models. Students are guided through the engineering design process, designing and building a prototype of their own invention or an improved product. The program aligns with Intel ISEF affiliated science fairs such as the Intel Northwest Science Expo (NWSE, profiled separately).

Training for teachers, facilitators, volunteers, leaders is: Available, Required. GSUSA runs one training a year for the councils participating in the Fairplay Initiative. The Columbia River Council trains its facilitators in early June. Facilitators are required to attend the council's training.

Cost structure: Day camp - \$200, resident \$440. Scholarships are readily available.

Funding: Grants from Department of Education, Intel, and Lockheed Martin.

Other points of interest: GSCRC (Girl Scouts-Columbia River Council) is also offering Science Fair Saturdays to get more girls interested in hands-on science inquiry. This program is geared towards introducing a girl to the Scientific Method and Engineering Goals, then having her apply them. The girls have the choice to attend the NWSE.

GSCRC has developed an additional curriculum called Engineering and Exploration for Design and Discover (D&D) alumna, which is also accessible to girls who haven't had a chance to attend D&D. Offered as a one week camp and as Engineering Overnights (name to be determined) during the fall of 2005, it has an emphasis on solving design challenges. Each overnight is based around this challenge, with the participants learning the engineering or science behind the challenge, then solving it the following day.