

Design and Discovery | Overview and Benefits

Dual Alarm Clock

Brenda: Seeing a Future in Engineering

When Brenda first started attending a *Design and Discovery* summer program as a middle school student, she was shy and reluctant to speak up. Her family had recently moved from Mexico, and she was learning English as a second language.

It didn't take long, though, before Brenda started asking questions. Curious about electronics and engineering, she discovered that she had a knack for taking apart appliances and learning about all the wires and components inside. Before long, she was sketching her ideas for an electronic project she wanted to design: a better alarm clock.

Here's a look at how her project—and her self-confidence—grew in tandem.

Developing Her Own Idea

Brenda's project idea grew out of her own experience. At home, she shares a bedroom with her older sister. As Brenda explains: "She works late, and I have to wake up early in the morning to go to school. When my alarm beeps, she hears it, too. She pretty much got mad at that. So that's why I came up with the idea for a clock with two separate alarms."

Guided by the *Design and Discovery* curriculum, Brenda conducted user surveys to find out what people hate most about alarm clocks. What did she discover? "They're loud and annoying. And they wake up everybody, not just the person who needs to get up early." Her research confirmed her hunch that most people would welcome a more gentle wake-up device.

An electrical engineer visited the program and gave Brenda suggestions for developing her idea. They took apart old alarm clocks and reassembled the components to fit Brenda's specifications. Using a shoebox as a "casing" for her alarm clock let her make modifications, such as adding two radio speakers—one to slip underneath each user's pillow.



Brenda had never met an engineer before attending the program, but now she wanted to learn more about this career field. Time seemed to fly whenever she was working on her project. "I might spend four hours without realizing how much time has gone by. It's just so interesting, you know?"

After the program ended, Brenda continued meeting with her mentor and refining her prototype. She entered her project in a regional science fair for middle school students and earned an honorable mention in engineering.

New Doors Open

The next year, the facilitators from Brenda's *Design and Discovery* program encouraged her to apply for a three-week residential summer program on a college campus. Designed to provide minority middle school students with an exposure to engineering, the program sounded like a perfect fit for Brenda's interests. She was intrigued, but hesitant. Getting to the location would require a plane trip, and Brenda had never flown before. She wasn't sure her parents would allow her to go. The travel cost also seemed prohibitive.



With her parents' nervous permission, Brenda applied and was accepted for the program. Alaska Airlines agreed to donate her airfare. Before long, she was off on a new learning adventure, taking her interest in engineering even further.

Today, Brenda's hopes of becoming an electrical engineer no longer seem like an impossible dream. Her middle school

teachers have watched the transformation in this once-quiet girl. She even encourages other students to consider a future in engineering. "Her confidence is way up," says one teacher, and her future seems full of opportunities.



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