Planning a Program
Implementation Strategies

A *Design and Discovery* program is most effective when implemented in an environment that allows for extended blocks of learning, making available sufficient time to introduce, carry out, and complete design investigations. This section provides information on planning a program that fits your needs.

Staffing
This area provides information on staffing positions and responsibilities needed to carry out a successful program.

Budget
Creating a project budget ensures allocation of money for specific program essentials, including the program facility and supplies. This section includes a detailed sample budget as well as fundraising ideas that can be used to plan a program.

Mentors
Mentors play an important role in the program. This area provides information on the role mentors play, how to recruit mentors, what makes a good mentor, training, and additional mentoring resources.

Field Trips
Field trips offer a real-world connection. This section assists with all logistics in arranging meaningful field trips that integrate with the curriculum.

Publicity
Publicity offers suggestions for ways to promote *Design and Discovery* for recruitment, sponsorship, and recognition purposes. It includes downloadable documents for promoting the program.

Scheduling
Sample schedules in this section provide examples of how *Design and Discovery* can be implemented in different settings to match program formats and timeframes.

Staffing
Planning a Program

The curriculum is best taught by knowledgeable and trained staff—ideally, with a science, engineering, or design background. If it is going to be taught by someone with background in another discipline, it is recommended that the facilitator review the curriculum thoroughly, try each activity, and if necessary bring in experts for the sessions where extra help is needed.

The staff should understand the design process, be fluent with the curriculum goals and the program's overall goals, be good communicators, and support family involvement. Facilitating learning through supportive exchange with students is essential. The goal is to nurture independence, not reliance on adult answers. Empowering each student to solve problems independently is critical behavior for staff. Ideally, there will be two staff members for every 10 students. A typical *Design and Discovery* program will have 20 students, two facilitators, and several mentors.

If you are planning to implement a *Design and Discovery* program, you will need to consider the following staffing positions and responsibilities.

Program Organizer
The program organizer is responsible for setting up a *Design and Discovery* program. This person is responsible for the safety and well-being of the students, administration of the program, and overall organization. This person will probably do the following:

- Hire facilitators
- Find a location for the program
- Establish a budget
- Do any necessary fund-raising
- Recruit students
  Recruit mentors
- Purchase the supplies
- Plan the field trips
- Plan the final event
- Train the facilitators

Facilitators
The ideal facilitator is someone who has had some experience teaching or working with youth. The curriculum is best taught by knowledgeable and trained staff, ideally with a science, engineering, or design background. If it is going to be taught by someone with background in another discipline, it is recommended that the facilitator review the curriculum thoroughly, try each activity, and if necessary bring in experts for the sessions where extra help is needed.

Staffing (continued)

The staff should understand the design process, be fluent with the curriculum goals and the program's overall goals, be good communicators, and support family involvement. Facilitating learning through supportive exchange with students is essential. The goal is to nurture student independence, not reliance on adult answers. Empowering each student to solve problems independently is critical behavior for staff. A one-day training should be set up for the facilitators.

Expect to have 1-2 staff members for every 10 students. There should be a minimum of two adults with the students at all times. A typical group size is 20 students.

Where to Find Facilitators
Look for staff among high school and middle school teachers, undergraduate and graduate university students, and staff of local junior/community colleges, and other colleges and universities. List positions with local professional associations, education associations, and school districts. If necessary, advertise in the employment section of your local newspaper. Many colleges and universities have student chapters of the Society of Women Engineers and other professional engineering organizations.

Screening Facilitators
Staff should complete an employment application and provide references. It is recommended that you do a criminal background check on each staff member. Check with your organization's insurance carrier for specific rules for your liability insurance. If staff will be responsible for transportation, a special driver clearance may be required by your organization.

Training and Orienting Facilitators
Staff training should be held prior to the beginning of the program and include the following:

- Day-to-day curriculum overview and work plan
- Site orientation including safety issues, room usage, computer systems
- Procedures for field trips
- Training in "facilitation" skills
- Emergency procedures
- Discipline procedures
- Review of the design process

Compensation
Expect to pay staff members $12 to $30 per hour depending on experience and standard wages in your area. Check with the local school district to compare pay rates for summer school teachers. Each facilitator will require approximately 120 hours including the sessions and prep and wrap-up time.

Budget
Planning a Program

You will need to allocate money for staff salaries, food, program supplies, T-shirts (optional), awards, telephone costs, postage, shipping, facility, printing, transportation, and insurance. Below is a sample budget in U.S. dollars.

Sample Program Budget

Income	Formula	Projected
Sponsorship		$10,000
Participant fees	$250 x 20 participants	$5,000
Total Income		$15,000
Expenses	**Formula**	**Projected**
Staff: program coordinator, instructors, assistants		$6,500
**Food		$800
Program supplies		$1,500
T-shirts	25 @ $10 ea.	$250
Training		$50
Awards/recognitions		$50
Telephone		$50
Postage		$250
Shipping		$100
**Program site rental		$1,500
Printing		$500
Mileage		$300
**Transportation	Two vans, two weeks	$2000
Scholarships		$1,000
Insurance		$150
Total Expenses		$15,000
** Starred items may be procured in-kind or provided by participants.		

The Facility

At a minimum, the program requires a classroom space with work tables (not desks) and access to computers with word processing, spreadsheets, and Internet connection. It is preferable to have access to a large computer lab so that you can incorporate technology whenever applicable and relevant to the tasks. An ideal site should include a classroom, a work area with access to tools (like a wood shop or metal shop), and a computer lab. The rooms should be closely located to minimize staff supervision needs. An outdoor work/play

Budget (continued)

area should be available, as well as a place for eating lunch/snacks.

Facility Suggestions
Possible sites include schools, colleges, local companies, science museums, community centers, or youth organization facilities, such as an Intel Computer Clubhouse, www.intel.com/education/icc. Look for a location that is central to your field trip sites and easily accessed by public transportation.

Facility Cost
Site costs will vary. Expect to pay $2,000 to $6,000 to rent a site. However, many of the suggested sites can be obtained for low or no cost. Collaborating with a local school district or organization is a good way to negotiate discounted space.

Supplies
Some supplies can be donated and others will need to be purchased. Be sure to review the supply list and plan ahead. The Supply List provides a detailed inventory of items needed for the program's hands-on activities.

Sample Fund-Raising Letter

Planning a Program: Budget

Date

Contact
Company
Address
City, State Zip

Dear Contact:

Engaging students in math, science, and technology is one of the most important factors in creating tomorrow's workforce.

Design and Discovery is a program that addresses this issue. Through hands-on activities, mentoring, presentations, and behind-the-scenes field trips, students discover the world of design and engineering. The participants are then challenged to identify a problem or opportunity and design a solution. Students present their designs to their peers and community in a design and engineering fair.

Design and Discovery will be offered to (number of) students from (school, club, organization) as an (after-school activity in the spring, summer camp, etc.). Participants are typically students in grades 7-9 that have expressed an interest in the program.

(background paragraph on presenting organization)

We would like to request (Company's) assistance in providing this opportunity to the students of (school, club, organization, area). Your sponsorship of (amount) would be greatly appreciated.

If you have any questions or would like additional information, please contact Sally Someone at 503-555-5555. Send email inquiries to someone@organization.org.

Regards,

Sally Someone
Design and Discovery Coordinator
Non-profit Youth Organization

Mentors
Planning a Program

Why Include Mentors
Mentors are a vital part of *Design and Discovery*.
Mentors are partners in learning, who can inspire
students and participate in *Design and Discovery* in
many ways. They might attend several days of the program and share their experience with
students while working on activities. Others may come in for a lunch or an hour to give a talk.
And others may devote time to a single student working one-
to-one on a design project.

Ideally, some mentors initially work with the whole group as
assistants and experts. Once students are focused on a
project and have identified their project needs (*8D: Mentor
Matching*), then one mentor works with one or two students
for an extended period of time to support each student's
project development. Mentors provide guidance and
personal attention. Additionally, they provide expertise, and
act as role models.

Recruitment
Mentors can be engineers, engineering students, product designers, high-tech professionals,
teachers, or any adult who has the necessary skills to assist the students. Mentors can be
recruited from a variety of places, such as local design and engineering businesses;
professional organizations such as the Society of Women Engineers (www.swe.org*),
American Society of Civil Engineers (www.asce.org*), American Society of Mechanical
Engineers (www.asme.org*); universities; parents; and friends. They can be recruited by word
of mouth, advertising, phone calls, and by holding information sessions. If mentors are not
available in your area, consider e-mentoring though universities and businesses elsewhere, or
an e-mentoring organization.

Time Commitment
Actual mentor hours will vary. It is important to figure out where mentors will be the most
beneficial. It is suggested that you include mentors in as many sessions as possible and
schedule them so that their expertise can be used in the sessions that relate to their
background. Starting in Session 12 or 13, mentors should work one-on-one with students to
assist them with their design projects. Again, they may not be available to be at every session,
but should be encouraged to work out a schedule with their assigned student. Contact with an
assigned student may include email, phone calls, individual meetings, and group meetings.

Mentors (continued)

Roles and Responsibilities for Mentors

- Act as a resource for an assigned student to help with his or her project
- Provide the assigned student with contact information and parameters for contacting the mentor for help (when and where to call, email address, etc.)
- Act as a role model for their field
- Notify program director of any issues or concerns

Mentors should not give students money or pay for project-related expenses.

What Makes a Good Mentor?

- A good mentor provides young people with support, counsel, reinforcement, and constructive feedback.
- Mentors are good listeners, people who care, and people who want to help young people bring out strengths that are already there.
- Mentors are role models who provide students with insight into their chosen profession and encourage students to pursue their interests.
- Mentors help students make connections with people who may be helpful to them.
- Mentors enjoy giving back through community service.

Training
Mentors should be briefed in their expectations, the structure of the program, and the curriculum. They should be given specific information about program rules regarding the mentor-student relationship. This should include safety issues and rules related to meeting times, sites, and methods of contact. They should be given a copy of the curriculum in advance so that they can become familiar with it.

Matching Mentors
Finding the right student-mentor match can be difficult. Plan to match students with a mentor once the projects are underway and project needs are clear. To match, you may:

- Have students select their mentors. (In this case, include multiple opportunities for interaction with mentors during the program prior to mentor selection.)
- Assign mentors based on areas of expertise.
- Assign mentors geographically.

Mentor Appreciation
Be sure that the facilitators and students write thank-you notes to the mentors acknowledging their commitment and contributions. Be sure to mention mentors in any publicity.

Mentors (continued)

Screening Mentors
Mentors should complete an application and provide references. It is recommended that you do a criminal background check on each mentor. Check with your organization's insurance carrier for specific rules for liability insurance.

Mentoring Resources
The Mentoring Center, www.mentor.org*

Friends for Youth Mentoring Institute, www.mentoringinstitute.org*

The National Mentoring Partnership, www.mentoring.org*

National Mentoring Center, www.nwrel.org/mentoring* (Technical assistance packets are available at www.nwrel.org/mentoring/packets.html*.)

Big Brothers Big Sisters of America, www.bbbsa.org*

International Telementor Program, www.telementor.org*

Mentor Profile
Mentors

Emily Hackett, Mentor
"You Get to See a Young Person Grow"

When Emily Hackett looks back on her education in engineering, she can think of several people who played an influential role. "There were teachers in elementary and middle school who encouraged me, and good advisers in college and graduate school. But I never had a female mentor. That's got to be helpful for a girl considering this career field."

Hackett has a Ph.D. in materials science and an undergraduate degree in mechanical engineering. She has worked in design automation, improving the design of integrated circuits. She also volunteers her time as a mentor to several girls participating in *Design and Discovery* camps. She learned about the program through a local chapter of a professional organization, the Society of Women Engineers. At first she was a little reluctant about mentoring. "It sounds ambiguous. What does one do as a mentor? But it's turned out to be a really good experience."

Hackett began meeting weekly with a group of girls who already had taken part in a summer *Design and Discovery* program. "They were at the point where they had ideas for products and were working on prototypes. I offered them some suggestions for materials they might consider using."

An eighth-grader named Taylor, for example, was working on a jewelry storage idea that would keep necklaces from getting tangled. Hackett describes their process: "I started by helping her with some back-of-the-envelope calculations: If you want so many hooks on that display disk, what does the diameter of the circle need to be? We used basic geometry." Taylor also wanted her display disk to rotate, and that meant adding a stepper motor. "It was important to her that the whole thing be automated. Neither of us knew quite how a stepper motor works. We had to figure out how to wire it with a controller. Taylor also had the idea of using knife switches—she had used them in the *Design and Discovery* camp. But she wanted to make it more complicated, with four switches. She caught on to the wiring just like that."

Taylor proved herself a skilled problem-solver. "She recognized a bug that I completely missed. She noticed the battery was getting warm and realized we should look for a short circuit. She's that focused on what she's doing," Hackett says.

The mentor also points out why a project like Taylor's offers good reason to get more women into engineering. "She's addressing a problem that women have, with jewelry getting tangled.

Mentor Profile (continued)

It's complicated *enough* for a good student project—an interesting challenge, but not too complicated for her to solve. At the same time, she learned a lot from it, both mechanical and electrical."

Hackett says it was easy to find a comfortable way to work together. "I found myself coaching her with questions. I've done a lot of tutoring and teaching before, so the tutor role comes naturally to me. And she is so bright and focused. It's like working with an adult engineer. We'll sit down for a work session, put our heads down, and look up two hours later. There are people I've worked with professionally who can't do that."

Taylor had her prototype ready two days before the deadline for a regional science and engineering fair. What was the reward for Hackett? "The rewards I've always gotten out of this kind of stuff, which is to have fun and, I hope, have some good influence on people in the community. You really get to see a young person grow, and you start to take some pride in their project." Mentors don't need extensive technical experience to be effective, Hackett adds. "People know more than they think they know. You don't have to be an electrical engineer to help somebody with a circuit."

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Sample Mentor Application
Planning a Program: Mentors

Design and Discovery is a design and engineering initiative for students entering the seventh through tenth grade in the fall. In a two-week day camp (dates) and regular follow-up activities, students will create a prototype for a design project. Mentors will work closely with one or a few students, advising and helping them with their projects.

Please complete the following application and permission to conduct a background check, and send with a current résumé to (mailing address and email address).

I. Basic Personal Information

Name:

Address:

Home Phone: Home Email:

Work Phone: Work Email:

II. Background and Interests

Do you speak any foreign language well enough to mentor a student whose native tongue is that language?

No   Yes   Languages:

Do you have any prior experience working with youth?   No   Yes

If yes, please describe:

List any special training, skills, hobbies, etc. that you believe will enhance your ability as a mentor.

Have you volunteered with any service organization?   No   Yes

If yes, please describe:

Sample Mentor Application (continued)

III. The Mentoring Experience

Have you ever been a mentor?		No	Yes
Have you ever been mentored?		No	Yes

Will you be available to mentor through (date)?   No   Yes

How many hours per month will you be available?

Please describe your personal goals for participating in Design and Discovery.
What do you hope to give?
What do you hope to receive?

IV. Design and Discovery-Related Questions

Did you enter a science fair in middle or high school?   No   Yes

If yes, please describe:

Have you participated in a science fair as an adult?   No   Yes

If yes, please describe:

Could you host a tour or job shadow at your
company?   No   Yes

If yes, please describe:

Disclosure Statement for Design and Discovery Volunteers

Name:
Address:
Phone: Email:
Social Security No: Date of Birth:
Driver's License No: State, Exp. Date
Occupation:

Sample Mentor Application (continued)

Employer:

Supervisor's Name:

Supervisor's Telephone:

1. Have you ever been convicted of a crime of violence?	No	Yes

If yes, please describe:

2. Have you ever been convicted of a crime against a person?	No	Yes

If yes, please describe:

Have you ever been a witness or accused (respondent) in a case in which a Family Services Agency determined there was substantiated conduct that was determined to be child neglect or abuse?	No	Yes

If yes, please give details, location, your involvement, and final determination.

Have you ever worked in a setting that involved either children or youth?	No	Yes

If yes, please give details, location, your involvement, and final determination.

List three persons not related to you who can judge your qualifications for this position.

Name	Relationship	Address	Phone Number
1.			
2.			
3.			

Sample Mentor Application (continued)

I hereby attest that all information I am submitting is true and complete to the best of knowledge. I understand that:

  A. It is the intent of the (name of organization) to deny a volunteer position to any person who has been convicted of a crime of violence or a crime against a person or to any person whom any Family Service Agency has found substantiation of a child abuse allegation.
  B. In applying for a volunteer position, the information that I have furnished on this form is subject to verification, which may include a criminal history check. I may be required to provide any necessary or required documentation to obtain said verification.
  C. Histories of psychiatric or psychological treatment reflecting impairment of my ability to handle children may result in denial of my volunteer application.
  D. If I am accepted as a volunteer, I may be removed from said position, or said position may be eliminated at any time, in the sole discretion of (name of organization) or its agents. I have, and hereby agree, that I have no right to continue in said volunteer position, and said position may be terminated at any time, with or without cause.

Signature						Printed name						Date

To be completed by organization
Interviewed by:										Date:

Field Trips
Planning a Program

Local field trips are a wonderful way to expose students to the real world of design and engineering and are an important part of the *Design and Discovery* experience. In some of the sessions, suggested field trips are noted. Field trips should be arranged well in advance.

Try to relate the field trip to components of the design process. Field trips should be designed to give students a unique opportunity to experience engineering in the real world. Field trips need not be expensive. The designed world is all around us, so even something as simple as a structured trip to the supermarket can be an effective field trip. Look for opportunities to show students engineering solutions at work. This can be as complex as an automated packaging plant or as simple as the water slide at the local pool.

Making Contact
To schedule a field trip, start with your personal connections. Most companies will allow behind-the-scenes tours, especially if an employee has an interest in it. Ask parents about their workplaces and jobs. Next, contact local branches of professional engineering organizations, such as the Society of Women Engineers (www.swe.org*), American Society of Civil Engineers (www.asce.org*), and the American Society of Mechanical Engineers (www.asme.org*). Most of these organizations have members that work in the engineering field and may be interested in helping some aspiring engineers.

New Field Trip Location
Be sure to discuss field trip goals ahead of time. Familiarize the host organization with the curriculum and establish a clear plan.

Chaperones
It is important to arrange chaperones for the field trips. These can be parents or mentors. All chaperones should be made aware of safety issues and procedures. When possible, be sure to include extra fun activities, such as a picnic, a trip to the beach, or a meal at a restaurant, etc.

Transportation
Transportation may involve renting vans, having parents drive, or renting a bus. Be sure to plan this into your budget.

Before the Field Trip
To get the most out of a field trip experience, it is important to be prepared. Have goals and expectations clearly discussed up front. Students can come up with questions or can be provided with a scavenger hunt. Students should be prepared to draw sketches, take pictures, and take notes to record their observations. Before going, pose the following questions: *What are we trying to find, discover, or understand today? How will you record what you find?*

Field Trips (continued)

During the Field Trip
Encourage students to look for solutions that they have seen designed. Be sure to debrief during the field trip. Discussion questions might include: *What did you find that others should see? How did you figure out how a design solved a problem? Are there additional problems you see that still exist?* Keep asking targeting questions that connect to the goals of the field trip. Tell them to look for things like specially placed lighting, signage, ways of containing or displaying materials, items that do one specific job, and features of the place they are visiting that have been designed to solve a problem. Tell them to notice informational displays and interpretive boards. Discuss: *How are materials presented? How is important information conveyed? How are pictures used? Drawings? Models?*

Allow time for sketches and picture taking, with the goals in mind. Ask that students share these pictures when they return as ways of reminding themselves and others what they saw that was valuable. They should also take advantage of any contacts they meet who can help them with their design projects.

After the Field Trip
Debrief the field trip by discussing what students got out of it and how the experience will help them with their projects. Have them share observations, sketches, and photos. Don't forget to send thank-you notes.

Field Trip Alternatives
If a field trip is not possible due to time or distance, consider inviting a local engineer, designer, or inventor to present to the group. Ask for an interactive presentation with a hands-on activity for the participants.

Suggested Field Trips and Experts (By Curriculum Section)

Understanding the Design Process
- A visit to a store, mall, a walk around the facility to identify problems, needs, and opportunities
- A field trip to a design or engineering firm to learn about the firm's design process
- Expert: product designer

Engineering Fundamentals
- A trip to a factory or plant.
- Experts: materials engineer, electrical engineer, mechanical engineer

Thinking Creatively About Problems and Solutions
- A visit to a place, such as a mall or store, to conduct interviews and get feedback on their ideas
- Expert: materials engineer

Field Trips (continued)

Making, Modeling, and Materializing
- A field trip to a bicycle repair shop
- A visit to the modeling shop of a design firm
- A trip to a hardware or home improvement store to look at parts and components
- Experts: product designer, shop manager, handyperson

Prototyping
- A visit to a design firm to see prototypes
- A place to conduct user testing on prototypes
- Expert: product designer

Final Presentations
- Guest speakers: engineer, product designer

Other Field Trip Ideas

- Manufacturing or packaging plant
- Supermarket
- Train station or rail yard
- Commercial farm with equipment
- Post office
- Water park (slides, tubes, fountains, etc.)
- Auto repair shop
- Machine shop
- Distribution warehouse
- Commercial bakery
- City waterworks or sewage treatment plant
- Power generation dam
- Bridges
- Locks
- Shipyards and docks
- Shopping malls (with escalators, people movers, etc.)
- Light rail, trolley, or transit system
- Construction site
- Rock quarry
- Military base
- Ship (merchant marine, military, cruise)
- Army Corps of Engineers
- City, county, or state engineering departments

Publicity
Planning a Program

Once you've decided to create your own program using the *Design and Discovery* curriculum, it's time to promote it. Start by announcing the program to the local media. Send a press release to the local newspapers, magazines, radio, and TV stations. Don't forget the school newspapers and community newsletters. Promotion is important for building both sponsorship and participation.

Recruiting Participants
Plan to recruit a large pool of applicants to ensure that your program will be full to capacity and represent a diverse group of participants. Place posters and applications in places where potential participants and/or their parents will have access to them. Provide applications to teachers, youth organizations, and clubs. Inform parents about the program and personally invite students to participate. Hold an information session to introduce the program and generate interest.

The Press
Design and Discovery is a unique, innovative curriculum and may be of interest as a feature story. Invite reporters to visit the program and attend the student presentations. Media coverage in your first year will help with recruiting and sponsorship in following years. Target reporters that typically cover business, technology, or education stories. Be sure to get parent permission for students to be photographed or featured in articles. The newspaper, radio station, or television station will typically have prepared releases. After the program, send a press release detailing the successes and experiences of the program. Include quotes from students and parents about the experience. If possible, include a photo of participants working on a hands-on activity. A close-up photo is preferable.

Sample Press Release
Planning a Program: Publicity

FOR IMMEDIATE RELEASE [Date]:
For additional information contact:
Sally Someone, *Design and Discovery* Coordinator (503) 555-5555

Design and Discovery Comes to Anytown
Anytown, USA—(Organization) will present *Design and Discovery* as an after-school program beginning (date) at (location).

Engaging students in math, science, and technology is one of the most important factors in creating tomorrow's workforce. "Science and technology skills have become basic skills—like reading, writing, and arithmetic—necessary to compete in today's economy," said Carlene Ellis, Intel's Vice President of Education.

Design and Discovery is a program that addresses this issue. Through hands-on activities, mentoring, presentations, and behind-the-scenes field trips, students discover the world of engineering. The participants are then challenged to identify a problem or opportunity and design a solution. Students present their designs to their peers and community in a design and engineering fair.

Design and Discovery will be offered to (number of) students from (school, club, organization) as an (after-school activity in the spring, camp in the summer, etc.) Participants are typically students in grades 7-9 that have expressed an interest in the program.

(background paragraph on presenting organization)

Sample Letter to Parents

Planning a Program: Publicity

[Date]

Attention Parents:

We are presenting *Design and Discovery* as an after-school program for grades 7-9.

Design and Discovery is a program that encourages exploration of product design and engineering careers. Through hands-on activities, mentoring, presentations, and behind-the-scenes field trips, students discover the world of engineering. The participants are then challenged to identify a problem or opportunity and design a solution. Students present their designs to their peers and community in a design and engineering fair.

This is a fabulous opportunity for students to have hands-on experience with high-tech tools, meet professionals working in science and technology, and get an insider view of several local design, engineering, and technology firms.

I have enclosed an application for your child. To be eligible, students should be in grades 7-9 and have an interest in science or technology. Scholarships are available.

If you have any questions or would like additional applications, please contact Sally Someone at 503-555-5555. Send email inquiries to someone@organization.org.

Regards,

Sally Someone
Design and Discovery Coordinator
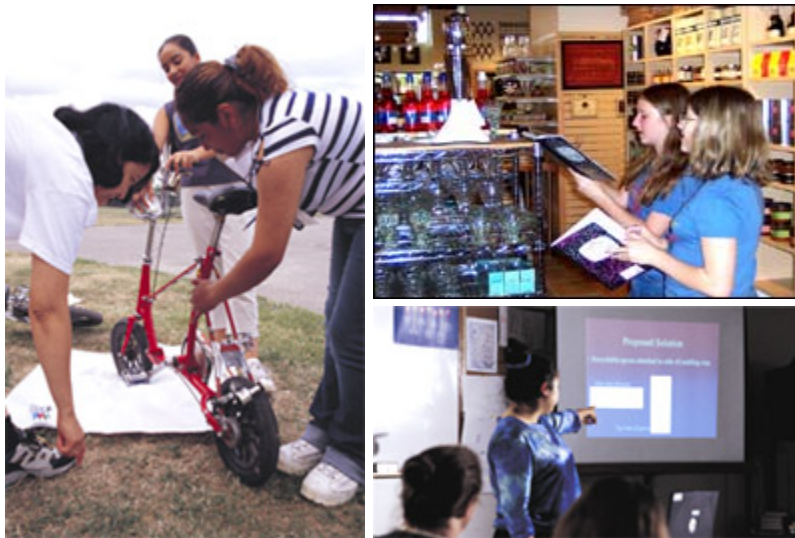Non-profit Youth Organization

Sample Student Application
Planning a Program: Publicity

Design and Discovery : An engineering and design [summer, after-school, weekend] program

[Dates]
[Location]

*[**Sample Program Description: Design and Discovery** is a design and engineering initiative for students entering the 8th, 9th, or 10th grade. This program involves students in the exploration of design and engineering concepts during an interactive [length of program] program.*

Through hands-on activities, field trips, and projects, students will learn to recognize and explore the designed world around us. They will meet scientists, engineers, product designers, and technology specialists. In addition, they will learn team-building skills and participate in related field trips. Students will develop a project that incorporates the study of design, engineering, and computer applications and will be supported by adult mentors.]

Sample Student Application (continued)

Design and Discovery	[dates]

REQUIREMENTS

[Sample Requirements: To qualify for the *Design and Discovery* program, students should be entering the 8th, 9th, or 10th grade.]

To apply, complete the attached application and return to:
[Name of organization, address]

THE SITE

[Explain where the program will be held, the address, and the facilities available there.]

DETAILS

Dates:
Times:
Location:
Fee:
Capacity:
Deadline:

TIMELINE

Applications Due:
Pre-Program meeting for students and mentors:
Program Dates:

DESIGN AND DISCOVERY VOLUNTEERS

Adult volunteers are needed to help with the program and chaperone field trips. Volunteers must (include requirements.)

Sample Student Application (continued)

Design and Discovery   [dates]

Name_____Age_____Date of
Birth___/___/___

Address_____
__
                    (Street)   (City)   (State)   (Zip)

Phone(   )_____Cell(   )_____Email_____
__

Grade in Fall 2002_____School (Name and
Location)_____

Parent(s)/Guardian(s)
Name_____

T-shirt Size?   SM   M   LG   XL   XXL

In the event of emergency, please notify the following person (available during program hours):

Name_____Relationship to
Participant_____

Phone(   )_____Cell Phone or
Pager(   )_____

INTERESTS

☐   Engineering   ☐   Medicine   ☐   Computer Science   ☐   Science

☐   Math   ☐   Education   ☐   Physics   ☐   Social Work

☐   Government   ☐   Law   ☐   Design   ☐   Other_____

Do you plan to attend college?   ☐   YES   ☐   NO   ☐   NOT SURE

Has anyone in your family attended college?   ☐   MOTHER   ☐   FATHER   ☐   SIBLING

(25)

Sample Student Application (continued)

ESSAY QUESTIONS

(attach an additional sheet if needed)

1. What is your favorite subject in school and why?

2. Why are you interested in this program?

Design and Discovery	[dates]

STUDENT AGREEMENT
I have reviewed the *Design and Discovery* program description carefully. I understand that admission to this program in done by individual selection based upon interest and essay submission.

_____ _____
Applicant's Signature   Date

PHOTO RELEASE
I, being the Parent/Guardian of:_____hereby consent that (student's name)_____ name, image, and likeness, whether in video-tape, photograph, motion picture film and/or electronic images for which she/he poses, and/or audio recordings made of her/his voice will be the property of and may be used by [name of organization], its assigns or successors, for purposes of promotion and /or recruitment of other students, including television, free and clear of any claim whatsoever on my part.

_____ _____
Signature of parent/guardian   Date

Sample Student Application (continued)

PARENT/GUARDIAN PERMISSION

As a legal guardian I give permission for the student named above to participate in all phases of the activities including off-site trips. I understand and agree to cooperate with all regulations. I will not allow her/him to attend if she/he is not in good physical condition. In an emergency, I give permission for the program authorities to take any emergency measure deemed appropriate. The parent/guardian will be notified as soon as possible.

THIS FORM CANNOT BE PROCESSED WITHOUT THE SIGNATURE OF A PARENT OR GUARDIAN.

_____ _____

Signature of parent/guardian   Date

Scheduling
Planning a Program

The *Design and Discovery* curriculum is most appropriate when implemented in a setting that allows for extended learning. Time needs to be provided for the session's hands-on activities and discussion periods.

The curriculum is probably best implemented in informal education settings, such as an after-school, weekend, or summer program. It is an ideal program for implementation by youth organizations such as Girl Scouts, Boys & Girls Clubs of America, Camp Fire USA, Boy Scouts of America, church groups, and science clubs.

Time Structure

Each session is 2.5 hours and is divided into activities. The curriculum can be divided into shorter sessions depending on your needs. Each activity varies in length (some may be 20 minutes, while other are 60 or even 90 minutes). It is important that the sessions and activities be sequential as each session builds on the previous session. The sessions were originally established as 2.5 hours for a two-week, all-day summer program. This structure left room for field trips, and other activities, such as swimming, and a lunch break. More information about scheduling ideas can be found in the Implementation Examples section.

Scheduling Options

The *Design and Discovery* curriculum covers approximately 45 hours of contact time with students. There are various ways to arrange a *Design and Discovery* schedule, from an intensive two-week camp immersion to an extended after school program. Each of the 18 sessions takes 2.5 hours to complete, without time set aside for breaks, meals, special field trips, speakers, or a final presentation.

In the first example schedule below, the program runs all day with each session lasting a half-day with breaks and lunch. This program would run two weeks with time for an additional half-day field trip and a half-day for an event to present final projects.

Scheduling (continued)

Sample Design and Discovery Camp: Two-Week Program

Week One

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-9:30	Orientation or Ice Breakers	Review Home Improvement	Review Home Improvement	Review Home Improvement	Review Home Improvement
9:30-12:00	Session 1	Session 3	Session 5	Session 7	Session 9
12:00-1:00	Lunch and Free Time	Lunch and Free Time	Lunch and Free Time	Lunch and Free Time	Lunch and Free Time
1:00-3:30	Session 2	Session 4	Session 6	Session 8	Session 10
3:30	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry
4:00	End	End	End	End	End

Week Two

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-9:30	Review Home Improvement	Review Home Improvement	Review Home Improvement	Field Trip	Set Up for Fair
9:30-12:00	Session 11	Session 13	Session 15	Session 16	Session 18
12:00-1:00	Lunch and Free Time	Lunch and Free Time	Lunch and Free Time	Lunch and Free Time	Lunch and Free Time
1:00-3:30	Session 12	Session 14	Field Trip to Design Firm	Session 17	Mini-Engineering Fair
3:30	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry	Wrap Up and Notebook Entry
4:00	End	End	End	End	End

Other Scheduling Options
In an after-school program such as a science club, each 2.5-hour session could be broken up over the course of the program. Devoting two 90-minute time periods per week to *Design and Discovery* sessions, the program could be completed in a semester, just in time for students to enter their projects into local and regional science fairs in late winter and early spring. The example schedule below shows how a science club meeting twice a week for 90-minutes each could implement the program. Additional time can be set up for more work sessions or field trip experiences.

Scheduling (continued)

After-School Schedule

Week 1	Week 2	Week 3	Week 4
Guest Speaker Activities 1A, B, C	Activities 2A, B, C, D	Activities 3A, B, C and 4A, B	Activities 4C and 5A, B
Week 5	**Week 6**	**Week 7**	**Week 8**
Activities 6A, B, C Field Trip	Activities 7A, B, C	Activities 8A, B, C, D and 9A	Activities 9B Field Trip
Week 9	**Week 10**	**Week 11**	**Week 12**
Activities 9C and 10A, B	Activities 11A, B, C and 12A	Activities 12A, B, C Field Trip	Activities 13A and 14A
Week 13	**Week 14**	**Week 15**	**Week 16**
Activities 14B, C and 15A	Activities 16A, B	Activities 17A, B Field Trip	Activities 18A, B
Week 17	**Week 18**		
Organize Fair	Presentations		