



NATIONAL SOCIETY OF BLACK ENGINEERS

**T.O.R.C.H. Handbook**

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## Introduction

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This handbook will outline what TORCH is, generally how to implement each type of programming, and the support available from the National TORCH Committee. Additional resources and detailed implementation guides will be available on the TORCH website.

### Objectives

Technical OutReach Community Help (TORCH) is NSBE's community service initiative. We aim to use our technical backgrounds to *positively impact the community* and achieve the following objectives:

- To provide science, engineering, technology and mathematics exposure opportunities within Black communities
- To stimulate enthusiasm about science, engineering, technology and mathematics within Black communities
- To provide introductory training to members of the community in modern technology, software and technical knowledge
- Promote the value of science, engineering, technology and mathematics education at all levels
- Encourage greater Black participation in science, engineering, technology and mathematics at all levels

### Program Components

TORCH is an umbrella program of NSBE, which encompasses outreach activities that impact non-NSBE members and NSBE members alike, especially pre-college youth in Black community. Although increasing membership may be a result of these activities, TORCH programs seek to provide services ahead of promoting membership. TORCH programs are divided into the following branches:

- **STEM Community Training**  
Formal classroom style education in STEM fields aimed at both youth and adults.
- **Informal Science and Engineering Education**  
Casual outreach activities, targeted at youth, which aim to show how science & engineering can be fun.
- **A Walk for Education**  
A single day outreach activity aimed at encouraging youth to be better prepared for higher educational opportunities in STEM fields, and in general.
- **Technical Expertise Services**  
Using our technical skills to provide a direct service to the community
- **Traditional Community Service Activities**  
Any other type of community service: food/clothing drives, volunteering at a shelter, etc.



## **TORCH vs. PCI**

TORCH events are focused on the objectives above, outreach and promotion of STEM fields, without regard to NSBE membership. PCI events focus on creating a NSBE pipeline and NSBE Jr. Chapters. It serves well for TORCH and PCI programs and activities to coexist, however, they are not the same. For more information about PCI, visit [nsbe.org](http://nsbe.org) and select PCI under Programs.

## **Chapter 1: STEM Community Training**

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STEM Community Training is the core of TORCH and directly impacts the digital divide in the most significant way. STEM community training may come in multiple forms and for any sub demographic of the community. Examples of STEM community training include: computer proficiency courses, tutoring for K-12 students in STEM, supplemental instruction in STEM, job readiness training, technology seminars, website design and programming. TORCH has the broadest impact of all NSBE programs and should not only reach the K-12 audience, but working adults, high school graduates and senior citizens. STEM community training should directly provide a skill or knowledge in the topic, similar to the outcome in a school course.

### **Forms of STEM Community Training**

A TORCH Center and program are distinctly different and reporting your center or program will need to be specific. Here are brief definitions for a TORCH center and program:

#### **TORCH Programs**

TORCH programs are moderate in length, varying between a few weeks to an entire year. The location tends to be fixed, and does not need to be specifically established in the community. TORCH programs can take place at a school, on your university campus, or at a community center that runs other programs as well. Programs can focus on a specific age range and specific offerings. Generally TORCH programs offer up to two types of programs in a given time period.

#### **TORCH Centers**

A TORCH center is a dedicated space in which NSBE TORCH offers majority, if not all of the training programs in that location. Ideally, a TORCH center is housed within the community, is open access to all community members, and has computers and equipment to offer the entire community. The content offered by centers is very broad touching multiple age ranges and demographics represented in the community. NSBE members engaged in TORCH direct the technical content of the center and offer multiple courses at one time period.

Regardless of whether your chapter selects a program or a center, the process is very similar and the following content will guide you in developing your program or center. A strong staple of TORCH lies within STEM community training, along with Informal Engineering and Science and Technical Expertise Services.



## Getting Started

In establishing a TORCH program or center there are considerations that need to be made early. The subset of the community that you desire to serve is extremely important and drives decisions later on location, time, and most importantly, the content of the program. To determine a population to work with consider the following:

- What groups are underserved in our community?
  - Elementary students, middle grade students, high school, non-high school graduates, seniors, etc.
- What types of STEM community training would most benefit the population?
  - Computer literacy, internet safety, e-mail and internet introduction, tutoring, supplemental instruction, GED preparation
- What access does your chapter have to the community members?
  - Community center, after-school program, senior citizens home, AWFE promotion, school contact
- What expertise can your chapter provide to the community?
  - Science and math tutoring, computer skills, specific technology expertise
- How many chapter members will actually participate in TORCH consistently?
  - Find out if any members have community service requirements for scholarships

Exploring the answers to these questions will help your chapter make the important decision of whom to serve, and will guide the rest of your program development. Take the time to answer each of these questions critically.

## Location, Location, Location

Another critical decision is location for your TORCH program. If your chapter has a connection with a community center, that provides the space and equipment you need, scheduling is the only real question. Work with the center director to determine times that your chapter can host programs. Definitely ensure that the times work well with the community members that you are serving as well as your chapter members. Be sure to consider how many people can comfortably fit in the space, as this will dictate the number of participants and volunteers at one time.

Hosting programs on your campus is also an option. Be sure to check with campus security for procedures for guests on campus, especially after hours and weekends as most of your programs will likely take place during these times. Also check with IT for any issues regarding computer use and access.

## We do not have Community Contacts!

This is frequently a question that arises while chapters start to decide on their chapter TORCH efforts. If existing contacts in the community and your chapter do not exist, forming those



contacts can be easy. One way to connect directly with the community is through hosting an AWFEE and handing out information for your TORCH program in the bags. This face-to-face advertising technique has been very successful in the past, and we encourage you to use your AWFEE as a method toward long-term impact. Working with the outreach program of your university or the college of engineering is also a great way to connect with existing community groups. The staff in these offices can provide you information on programs that request volunteers from the college or university. Another way to develop community contacts is to just make them! Visit the community centers, after-school programs, senior citizen programs or other groups in your area. Introduce yourselves, NSBE and TORCH, get to know the staff and determine together the best way that your chapter can service the local community.

## Chapter 2: Informal Science and Engineering

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Informal engineering and science education is becoming a widely used method to engage individuals in STEM in a more personal way, generally without a highly descript method of delivery. The NSF provides this definition: “Informal learning happens throughout people's lives in a highly personalized manner based on their particular needs, interests, and past experiences. This type of multi-faceted learning is voluntary, self-directed, and often mediated within a social context. It provides an experiential base and motivation for further activity and subsequent learning.” This aspect of TORCH differs from STEM Community Training as the method of delivery is not in a formalized setting and engages the learner with an activity that may not directly be considered by the learner as science. Examples of TORCH informal engineering and science education activities include: kitchen chemistry, engineering open house activities, engineering arts and crafts and engineering demonstrations.

### How to Get Started

Incorporating Informal Science and Engineering to your chapter programming can be done in many ways that involve varying degrees of commitment. Informal science and engineering can come from simple one-time events or be incorporated into long-term seminars that meet on a regular basis. One way chapters can incorporate Informal Science and Engineering as part of their outreach activities is by providing fun and simple science experiments for groups to perform at a local Boys and Girls Club, or grade school.

As with any programming initiative the first step is to choose a target audience. Common audiences would be high school and middle school students, but even elementary or younger students could be the target audience as well. The easiest way to facilitate an activity and ensure that it will be effective is to partner with a school or community organization that already has a captive audience and cater your program to them.

Once the audience has been identified the next step is to set the overall logistics of the program and select the type of session you will host. Will it be interactive or more of a demonstration? Will there be single session or will the students rotate among several different activities?



The next several sections will describe different logistical approaches, types of activities and provide several resources and potential partnerships for your Informal Science and Engineering outreach activities.

## **Forms of Outreach**

### **Field Trips**

Invite a class full of students to campus for the day. An easy way to facilitate this is to work with the school of education on your campus.

### **Reverse Science Fair**

Instead of the traditional science fair where students present their work to judges, experts in the field will present their knowledge through activities and demonstrations to youth to encourage them to consider entering a STEM field. A good balance of static demonstrations and interactive activities should be maintained so that kids remain engaged in the activities at hand. This type of event is especially well suited for conferences or for collaborations among engineering professional societies.

A separate guide on planning an Informal Science and Engineering Fair is available on the NSBE website.

### **Visits**

Visit a school or community after school program and bring an activity with you.

## **Types of Content**

### **Demonstrations**

Demos can be a quick easy way to engage students and spark interest. This type of activity can be easier logistically to handle, and require fewer volunteers. For a demo you can simply have 1-2 volunteers that are well versed in the subject matter at hand and additional volunteers or chaperones who are responsible for the students, dependent on their ages. Below are some ways to coordinate hosting a demo as part of your chapter TORCH programming.

Partner with a lab or research center on your campus and host a demo of something that they do for members of the community, especially youth. Be sure to pick a group with work that has a clear connection to its long-term application and has an engaging demo. Engineering research centers funded by the National Science Foundation are a great resource for this type of activity. K-12 outreach is strongly encouraged for all of them and required of the newer ones. Recap after and talk to the participants to highlight where science and math were involved in the demo.

Work with faculty or teaching assistants to alter an interesting lab activity that you've done in class into a demonstration. Find a senior member of the chapter to present the on the work



they've done for a senior project. Be sure though, to make sure that the project is something that the kids will understand or connect with on some level.

### **Activities**

Activities are the best way to engage students in science and engineering in a relatively informal manner. One suggested way to implement an activity is as a competition. If the activity results in building or designing something more permanent, a completion is less necessary. For example if building bridges, it may be best if done as a completion, however an activity such as making slime would not make sense to be done that way.

When planning an activity, it's important to keep in mind the supplies. It may be necessary to choose a different activity or alter the procedure dependent on the available funds. To keep the activity most effective as an informal activity, the supplies should be regular things that can be found in most grocery stores. This will make the idea of the activities more realistic and feasible for students and encourage future experimentation better than exposing them to specialized equipment that they wouldn't have access to in daily life.

### **General Tips**

#### **Collaborate**

Most campuses have other groups doing some sort of outreach program. The easiest way to get started is to use a "borrowed" audience and only have to worry about the content you provide. Try your school's education program and see if any student who is student teaching could connect you to a classroom. For a younger audience partner with a Jumpstart program, it's never too early to introduce kids to science & engineering and there are plenty of activities aimed for any age range.

#### **How to Present to Kids**

When explaining the scientific context of the activity, take care to cater your explanation to your audience. Try to use questions to guide kids to 'discover' the explanation on their own. Making a discovery rather than being taught will make the activity different from school and encourage the kids to maintain and interest in the subject at hand.

If hosting a demonstration, be sure to select something where the science has both a "wow" factor and a clear application. The goal is to spark interest in science and show kids that they can have a future working in a STEM field. Something flashy will get their attention, but if there is a clear application and relation to the "real world" or everyday life, they're more likely to remember.

#### **Involve Families**

If hosting an event on a weekend involve the parents in the activity. Kids who have a parent working in a STEM field are much more likely to enter one, while we can't afford this advantage to more youth, we can help parents be supportive of their children's' aspirations by helping parents understand.



If working with a school or afterschool program, give the kids a handout to take home that includes not only extensions for the kids but a letter to the parents. Use the letter to the parents to describe the activity that the child participated in and some background on who you are and why you are working with their child's school or after school program.

## Chapter 3: A Walk for Education

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The goal of A Walk for Education (AWFE) is “to increase awareness of the opportunities available through education particularly in the STEM fields and to shatter myths about African-Americans in math, science, engineering and other technologies.” AWFE is a grassroots program in which NSBE members go door to door in underserved Black communities and hand out information on college, scholarships, SAT/ACT preparation tools, NSBE and the benefits of majoring in STEM fields. AWFE is the primary outreach and advertising mechanism of TORCH. AWFE should be used to promote the other TORCH activities of the chapter.

AWFE is now a chapter-based program, with support from the National TORCH Committee. AWFE is designed to impact both traditional students and non-traditional students and should be paired with other TORCH programs. Examples include promoting STEM Community Training Program as Northeastern University did, hosting an Informal Science and Engineering Activity as the Charlotte Alumni Chapter did, or even pairing AWFE with a day of general service. A second activity will reinforce the NSBE members' dedication to the community, provide additional time for members to interact with members of the community, and thereby make the information that was passed out that much more meaningful.

### Hosting AWFE

To host AWFE your chapter should consult the AWFE Implementation guide for a detailed plan of how to plan AWFE. You may receive funding and certain materials from the National AWFE fund by submitting a proposal. Proposals will be funded based on the strength of the chapter's plan and the connection to the TORCH objectives and only if an AWFE sponsor is obtained. If no sponsor is obtained, proposals will be forwarded to the National Programs Fund. Walks will ideally be in the same community as a chapter's on-going service project or include an Informal Science and Engineering or Technical Expertise Services event in conjunction with the walk. Though less emphasis is being placed on AWFE and financial support may not be available AWFE can still be an important component of a full TORCH program. This single day outreach effort can increase attendance at other TORCH programs and is a low-commitment way to introduce more members to your chapters' TORCH program.

An Implementation Guide for AWFE can be found separately on the NSBE website.



## Chapter 4: Technical Expertise Services

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NSBE members in college, graduate school and those working as technical professionals have skill sets that can be used to enhance the community through NSBE TORCH programming. Technical Expertise Services seeks to match NSBE members with community-based organizations that have specific engineering or project management needs. This can be very broad but examples would be device enhancements to help the disabled, solar power cell installation for a home for a family in need, or strategic planning advice for a small non-profit. This area of TORCH lends itself to expanding current partnerships with universities (senior design projects), companies with community endeavors, and other well-known organizations such as Habitat for Humanity.

Technical Expertise Services, or TES, provides professional caliber, technical services in the areas of Training, Roundtables, Education, and Career Services. TES utilizes the expertise of the alumni, upper-level and graduate student members of NSBE and affords these members the opportunity to take their specific technical skills and use them in service to the Community.

Many of community-based organizations that provide services to children, adults, and seniors often do not have the funds to hire professionals to do things such as manage their IT infrastructure, provide technical training, convene professional panels, or review personal advancement documents such as resumes, business plans, planned university course load, etc.

TES will use the model of integrated product teams (IPTs) of NSBE professionals, S&T Companies, other affinity groups/organizations, and community TORCH centers. These teams will plan and execute projects, which provide TES services to TORCH organizations and the surrounding community. As a general operating rule, NSBE Special Interest Groups (SIGs) – the technical clearinghouse in the Society – will be solicited to provide technical leadership, and TES managers will match the myriad of technical skills of the group members to meet the diverse needs of our communities.

### Focus Areas

#### Service & Training

This area of technical expertise services is the most obvious and partners easily with traditional community service. Spend a few hours helping the staff a community center update their use of technology or teach them how to better use what they have available. Provide IT services to a local non-profit. Use your technical expertise to consult on a design for Habitat for Humanity or a similar organization. These efforts of providing a service should also have an educational component when possible as to empower the organization to be able to maintain any technology that you provide. Good partners for these types of activities are Engineers Without Borders and the American Society of Civil Engineers. This is also an area for alumni and PCI to work



together on a service project. For example alumni may do the design work and then work side by side with high school NSBE Jr members to implement and build a new bridge in a park.

**Roundtables**

The roundtable element will serve members of the local community who are interested in hearing from subject matter experts and technical professionals. The roundtables are intended to address technical and/or social issues of interest to our community, for example, the NSBE Environmental Engineering SIG could sponsor a roundtable on *Air Quality and Pollution in Urban Cities*.

**Career Services**

Career Services will span college counseling services to early-career advisory services. IPTs supporting Career Service projects will focus on resumes, strategic career plans, job searches, and available hiring and career development resources. This could mean sponsoring a seminar on how to write an effective resume, or assisting members of the community in conducting an on-line job search.

**Leadership Crosswalk**

**Getting Started:**

|         | Local TORCH Coordinator   | Local NSBE Coordinator                           | Local Industry/Professional Coordinator                  |
|---------|---|--|--|
|         | Services TORCH Center   | Services local NSBE Chapter                      | Services Company or Organization                         |
| STEP 1) | Identify Center needs for TES   | Identify NSBE resources to devote to TES         | Identify company/org. resources to devote to TES         |
|         | <i>Interview staff, volunteers, and patrons</i>                         | <i>Sign-up sheets for Focus Areas (T,R,E,CS)</i> | <i>Confirm company/org. intent to allocate resources</i> |
| STEP 2) | Reach out to local AE, Grad Chapter, S&T Co, affinity organization, etc | Reach out to local TORCH center                  | Reach out to local AE Chapter or TORCH Center            |
| STEP 3) | Align needs with resources to pick TES programs                         |  |  |
| STEP 4) | Identify the Focus Areas and IPT members for each project               |  |  |
| STEP 5) | Plan/Coordinate Schedule of TES Events by Focus Area                    |  |  |
| STEP 6) | Plan & Publicize TES Events <i>at TORCH Center</i>                      | Plan & Publicize TES Events <i>within NSBE</i>   | <i>Support</i> the Planning & Publicity of TES Events    |
| STEP 7) | Execute TES Event   |  |  |
| STEP 8) | Evaluate TES Event  |  |  |



## Chapter 5: Traditional Community Service

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While NSBE members have the opportunity to provide unique services from their engineering background, oftentimes the community still needs fundamental human service needs that traditional community service activities provide. These activities, while not a paramount focus are still a way that NSBE may positively impact the community and often can include a broader base of members to impact a greater number of individuals. Traditional community service activities should be a part of all physical meetings of NSBE regional and national leadership and all regional conferences and events. Traditional community service activities include: food, clothes, book/textbook, toy and school supply drives, food distribution and serving, clean-ups, Habitat for Humanity and other similar projects.

These programs can also be used to support and strengthen the impact of other TORCH programs. For example, donate supplies from a school supply drive to an afterschool program and do an informal Science & Engineering activity with the kids there, or clean up a park in the neighborhood where your AWFE will be held. This will show a continued support in the neighborhood and increase the impact on the community.

## Chapter 6: TORCH Implementation and Support

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There should be a TORCH event and TORCH workshops to teach the membership more about what TORCH is at every conference. October is National TORCH month in NSBE. Additional information will be available on the TORCH pages of the NSBE website annually, but this is a time when TORCH efforts should be focused and advertised more to the membership. AWFE's will only be supported during TORCH month. Members can participate in MLK Day of Service and wear NSBE gear or join local National Engineers Week activities as a part of their TORCH participation. Specific shorter guides for these events will come out throughout the year, and there are summaries of NSBE's participation of these events below.

The National TORCH Committee can support chapters and regions in two ways: grants & awards. TORCH programs can receive funding from the committee to run their programs by submitting a proposal to [torch@nsbe.org](mailto:torch@nsbe.org). At National Convention, a chapter, region, and individual will be recognized with a cash award their participation in TORCH.

### **TORCH Month: October**

TORCH Month will be when all NSBE funded AWFE's will occur. Chapters should also host another TORCH activity during the month, or use a general body meeting (GBM) to increase TORCH awareness among the members. The TORCH month guide will have more detailed information and activity guides about easy specific easy to plan activities for chapters.



## USA Science and Engineering Fair: April 2012

The DC Alumni Extension, National TORCH Committee, and WHQ will be hosting a booth on the Mall during this event that is a part of the President's Educate to Innovate Program. If you are in the area and would like to support this event, please contact [torch@nsbe.org](mailto:torch@nsbe.org) for more information.

## National Engineers Week: February: February 19-25

See the National Engineers Week Foundation for details about how to get involved. This is a great time to partner with other engineering professional societies, both student chapters at your school and local alumni/professional chapters.

## TORCH Proposal Criteria

TORCH funds may be used to support program related expenses for NSBE members to implement activities. Supplies for Informal Science and Engineering Activities, software or printing for STEM Community Training Programs, and resources for preparation of Technical Expertise Services are examples of items that can be funded. Stipends, food, and travel related expenses will not be funded.

A strong proposal will show that the chapter has worked to minimize the cost of the program by seeking outside funding and designing a creative program, a partnership with a community organization to ensure participation, and effective planning. Scope of the program and chapter experience in the area will also be considered. Proposals for AWFE specifically will evaluate the chapter's overall TORCH program and other components in addition to AWFE because the impact of AWFE is dependent on follow-up programming.

## TORCH Award Criteria

- **Hours of Service:** Volunteer hours will be the first criteria used to evaluate chapters' participation in the program. The total number per chapter- normalized to chapter size, hours per active member, and percentage of membership participating will all be considered and weighted into award decisions.
- **Consistency of Reporting TORCH:** If hours are only submitted prior to Convention and not consistently they will be weighted less than those chapters who consistently report hours. To achieve the most credit in this area and allow the TORCH team to best support your efforts your TORCH program should be 'registered' in August or September (or whenever you start), hour sheets should be submitted monthly, and complete reports should be submitted once per semester.
- **Quality of Reporting of TORCH efforts:** Reporting tools for the number of volunteer hours, surveys for participants and surveys for volunteers will be available. In order to measure the effectiveness of the program and better support the program in the future we need to have this data. Chapters supporting the TORCH program at a national level by providing this essential data will be recognized.



- **Participation in multiple branches of TORCH:** A thorough implementation of the TORCH umbrella of programs will be given additional consideration. Additionally linking various efforts to improve the impact on the community, not only the number of people touched will be considered. It's great to reach a lot of people, but a single day doesn't have as great of an impact as a continued partnership between a chapter and community. For example, when your chapter is looking for community service projects, work with the same people where you teach classes, or if you're looking to provide technical expertise services offer them to a local Soup kitchen where the chapter volunteers regularly.
- **Contributions to TORCH Community:** The ultimate goal of TORCH is to *positively impact the community*, chapters who support the overall mission of TORCH by sharing the tools they develop with other chapters through the National Committee or helping to support nearby chapters' TORCH efforts will also be recognized. For example if your chapter has a STEM community training program, sharing your lesson plans so that other chapters can get started without duplicating your efforts will positively affect your chapter.

**TORCH Awards:**

Member of the Year, Chapter of the Year (collegiate & alumni), Outstanding AWFE, Innovative TORCH Program, Region of the Year