Training Others to Deliver High Quality Science Programming

Introduction

It is quite likely that the most under-appreciated component of high quality 4-H Science programming is staff and volunteer training. Program planners and frontline staff usually have high hopes for program success, but are often disappointed when outcomes do not match expectations. The culprit may not be in the program's design, but in the lack of adequate preparation for those anxiously engaged in program delivery! This can be easily remedied by developing training *programs* with the same care and attention to detail that goes into the program planning process.

Perhaps the most important reason to develop a high quality training program is to ensure *fidelity of implementation*. Fidelity of implementation refers to how well program delivery corresponds to the ideal envisioned by the program planner (or curriculum author). Solo 4-H agents or educators cannot possibly reach the large numbers of youth in urban areas by themselves, so they must rely heavily on staff and volunteers. This is when fidelity of implementation becomes important. It is a fairly simple matter for a single 4-H professional to deliver programs in a similar manner across various venues and audiences – but another matter entirely when several people are responsible for program delivery. In addition, the sheer diversity of potential facilitators (e.g., 4-H colleagues/peers, associate staff, contracted staff, content rich volunteers, teenagers, collaborating afterschool and summer staff, community volunteers, etc.) virtually guarantees there will be differences in implementation!

The key, therefore is to provide training that will help program staff and volunteers implement content-rich, developmentally appropriate science programs in a similar manner across facilitators, audiences and venues. In the service of fidelity of implementation, it is important to mention that one-shot training does NOT work. To reiterate, *one-shot training does not work!* It is critically important to fidelity of implementation, *as well as* youth outcomes, that a training program provide the continuous, ongoing support program staff, volunteers *and youth* need for success.

The purpose of this chapter is to detail promising practices for training others to deliver high quality science programming. There are, however a few training practices worth emphasizing at this point:

1. Make it fun – future facilitators will model what they see!

2. Use an experiential, inquiry based approach – future facilitators will model what they see!

3. Limit the use of scientific terminology – future facilitators will model what they see!

4. Focus on science *processes* – future facilitators *will* model what they see!

Promising Practices

The promising practices for *Training Others to Deliver High Quality Science Programming* are subdivided into three categories: (a) Program Planning – Professional Development Opportunities, (b) Program Delivery – Professional Development Opportunities, and (c) Supporting and Recognizing Program Staff and Volunteers.

Program Planning – Professional Development Opportunities

In the Beginning

1. *Commit to providing program staff and volunteers with the continuous support and opportunities for professional development required to sustain quality 4-H Science programs.* Recognize from the start that the level of program success will be directly related to the level of support provided to frontline staff and volunteers.

2. *Ensure that staff and volunteers are well trained.* Program staff and volunteers need to feel comfortable with all aspects of providing 4-H Science programs – *content* and *context*.

   - Providing on-going (over time), comprehensive (content- and context rich) professional development opportunities is critical to 4-H Science program success.

   - This may be especially true in an urban program where new staff may not have been exposed to positive youth development programs or principles.

3. *Meet program staff and volunteers where they are.* Program staff/volunteers will have varying levels of experience and skills. They may have very little experience (or perhaps a negative experience) with science and may well have anxiety about delivering science curricula.

4. *Complete the <u>4-H Science Needs Pre-Assessment</u>.* Program staff and volunteers should also complete the instrument. This assessment will reveal personal and organizational strengths and challenges to implementing 4-H Science programs (see *4-H Science 101* in *Resources* below).

5. *Encourage program staff and volunteers to complete the <u>4-H Science Competency Self-Assessment</u>.* This tool will help improve 4-H Science program delivery and aid in staff development (see *4-H Science 101* in *Resources* below).

   - This assessment will reveal strengths in and challenges to implementing the core competencies.

   - Review results individually with staff/volunteers and help them set personal goals.

   - Develop training modules based upon overall results to address opportunities for improvement.

6. *Plan quality, professional training.* Components to include in trainings will be discussed in more detail (see *What to Include in Trainings* below). Often people equate quality with a "professional" look and feel. The following tips will aid in increasing the professionalism of trainings:

   - Request pre-registration. Assign someone to staff a sign-in table the day(s) of the training to check people in, hand out name badges and packets, and answer any questions. Materials should be displayed in an orderly manner, and the table should be manned at least 30 minutes prior to program start.

   - Provide information packets (folders) for participants to use during the training (agenda, worksheets, note paper), and include any take-home hand-outs, supply lists, directions, and so forth.

   - Use printed name badges and have certificates of completion for each participant.

   - Create appealing collateral materials (flyers, forms, agendas, hand-outs, etc.) that shout "professional!" Use white space for emphasis. Eliminate the use of clip art and word art. Use high quality, 21st century graphic images.
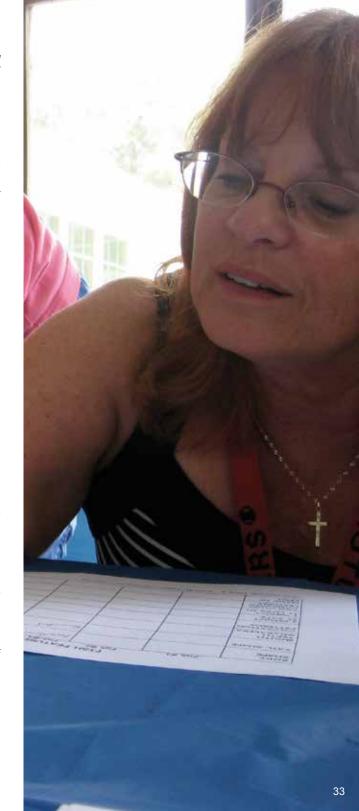
- Begin and end on time. Begin and end on time. Begin and end on time!

- Provide (and follow) an agenda. It is not necessary to provide times (other than start and end). This allows trainers to "go with the flow" according to audience needs.

- Bring at least one assistant whenever possible. This will depend upon the size and scope of the training. Multiday functions that include refreshments and meals will require at least two assistants, one to coordinate food service and one to assist in the training. It is better to arrive over-staffed than under-staffed!

7. *Adopt (or adapt) the National Partnerships for After School Science (NPASS) model for training 4-H Science program facilitators.* This model provides outstanding support for facilitating inquiry based learning activities (see *NPASS* in Resources below).

8. *Subsidize professional development opportunities.* Use grant or other soft monies whenever possible to subsidize at least part of the cost of the training (e.g., 2-day institutes, full-day trainings, in-services, workshops, etc.). Prospective trainees may or may not have the funds for a 100% fee-based model. The goal is to reduce barriers to entry as much as possible in order to increase the quality of 4-H Science programs as well as the number of youth served.

<u>What to Include in Trainings</u>

9. *Include the following topics in the initial, as well as on-going trainings.* These topics have been identified as "critical" for supporting program staff and volunteers prior to and during program implementation. Topics focus on delivering science *content* in the appropriate positive youth development *context*. This is what sets 4-H Science apart from other formal or informal science education activities!

Critical Training Topics

These topics are important regardless of staff/volunteer background and/or experience.	Content	Context
a) **Inquiry based learning** (4-H Science Checklist)	☑	☑
b) **Experiential learning model** (4-H Science Checklist)	☑	☑
c) **4-H Science Abilities** (4-H Science Checklist)	☑	
d) **4-H Science Checklist***	☑	☑
e) **4-H Science Logic Model*** (include program assessment/evaluation)	☑	☑
f) **4-H Science Core Competencies** (Essential Elements of 4-H Youth Development)*	☑	☑
g) **Program curriculum** (project kits, materials, tools, etc.)	☑	
h) **Ages and stages** (developmentally appropriate practices)		☑
i) **Group management**		☑

*See 4-H Science 101

a) *Inquiry based learning:* Most program facilitators, regardless of background, will need training to support the inquiry based learning approach. It is crucial that they understand and become comfortable with the process of facilitating inquiry (as opposed to merely transferring information) (see chapter on *Inquiry Based Learning Approaches* and the *4-H Science Professional Development Toolkit* in *Resources* below).

b) *Experiential learning model:* While an inquiry based approach *does* include components of experiential learning, it does *not* specifically address application and community engagement (see the *4-H Science Professional Development Toolkit* in *Resources* below).

c) *4-H Science Abilities:* These abilities are included in the *4-H Science Checklist*. Exposure to and mastery of these abilities is important for increasing foundational science skills (see *4-H Science Program Design – 4-H Program Checklist*).

d) *4-H Science Checklist:* The checklist outlines seven components of "Science Ready" programs. Staff and volunteers should use the checklist periodically as a self-check for program implementation (see also *Appendix I – Make a Better Pinwheel: Review and Share* in *4-H Science 101* in *Resources* below).

e) *4-H Science Logic Model:* Break the model down into bite-sized sections so as not to overwhelm trainees. Focus especially on outcomes (see *4-H Science 101* in *Resources* below).

f) *4-H Science Core Competencies:* Ideally, the *4-H Science Core Competencies Self-Assessment* was completed in advance of planning initial trainings. During trainings, focus upon areas that need strengthening. Administer subsequent assessments as part of on-going trainings so trainees can track their development. Include ideas on how to strengthen/implement competency areas (see *4-H Science 101* in *Resources* below).

g) *Program curriculum:* Modeling the correct use of program curriculum is imperative. When planning the trainings, plan to facilitate lessons/activities the way they should be implemented with a youth audience (for more information see *Program Delivery – Professional Development* below). Also demonstrate the appropriate use of project kits, materials, tools, and so forth.

h) *Ages and stages:* Most staff/volunteers will benefit from at least a refresher course on developmentally appropriate practices. Do not assume, however that people who are already involved with youth (associated with education or youth serving organizations) are familiar with developmentally appropriate practices. If using teen/adult facilitator teams, consider including *Youth as Partners* training as well.

i) *Group management:* This is especially useful for people who are not comfortable with facilitating or working with more than a couple of youth at any one time.

10. *Include video vignettes of program facilitators in action.* Allow time for trainees to discuss/critique what does or does not work in the video. The facilitators in the videos should not be known to the current audience – if necessary arrange to borrow video from colleagues in other counties or states.

11. *Include opportunities for trainees to facilitate an activity or project as part of the training.* This is also known as a "teach back." This would be done on the second day of an initial two-day training, or at any time in subsequent trainings.

12. *Include opportunities to discuss and process different presentation and facilitation methods.* This is quite

helpful, so trainees can understand the differences between lecture, demonstration, guided inquiry, and open inquiry. Use the learning module in the *4-H Science Professional Development Toolkit* (see *Resources* below).

13. *Include time for reflection.* Trainees will need time to process everything they are learning. Be sure to include ample time for discussion and reflection throughout the training. Allowing the trainees time to reflect will help them remember to do the same when they facilitate the programs with youth.

<u>Frequency and Timing</u>

14. *Provide regular professional development opportunities for facilitators.* Periodic in-service trainings for new and experienced facilitators are very helpful to their success, and to maintaining fidelity of implementation. Conduct multiple sessions and include learning activities to support content and context. Encourage experienced facilitators to assist in the trainings. Regular trainings:

   • Allow program staff and volunteers to build partnerships and relationships with each other and the trainer(s).

   • Provide on-going opportunities for feedback, problem-solving, encouragement, praise, and support. (see also *Personal and Resource Support for Facilitators* below).

   • Facilitate development of a community of practice. Partnerships and relationships are built over multiple training sessions.

15. *Plan multiday trainings.* Do not be afraid to ask staff and volunteers to commit to a two-day (or longer) training, especially when launching a new program or working with new personnel. A two-day training allows for more reflection/processing time, and facilitates the inclusion of teach-backs as part of the professional development experience (see *Item #11* above).

16. *Offer trainings to complement program implementation.* Provide a once-a-month series of trainings to introduce multiple projects in a curriculum and to reinforce positive youth development (PYD) principles. This allows the facilitators to receive the training information and implement the projects over the following weeks. The training should cover the curriculum that will be used for that month, and facilitators should receive the corresponding materials kit at that time.

Program Delivery – Professional Development Opportunities

1. *Include teens on your training team.* Trainings are the perfect venue for modeling youth as partners *and* demonstrating team facilitation. This approach is especially effective for use in trainings that include new teen facilitators, as the new trainees get to see experienced peers in action (see also <u>*Staffing with Teenagers and Teens as Cross-Age Teachers*</u>).

2. *Utilize experienced facilitators as trainers.* Experienced facilitators bring a unique perspective to the trainings and can respond to specific questions with authority. They also offer tips for handling all types of situations that arise during program sessions.

3. *Allow time to model a typical science activity or project.* The importance of modeling inquiry as part of the training cannot be overstated. Trainees need to experience the process themselves to better understand how it looks and feels.

   • During the session, deliver activities from the curriculum as if facilitating to the youth audience.

   • Do not step out of character or narrate that process – just do it! Teaching "tips" can be delivered at the end.

- Allowing facilitators to experience the project for themselves encourages the true excitement of learning.

4. *Address the science fear factor.* Perhaps the biggest fear prospective facilitators have regarding science programming is that they will "do" it incorrectly, or that they will not have the "right" answer. Reiterate that *it is okay* (even desirable) **not** *to have all the answers* – the best facilitators do not provide answers – they provide experiences! Focus staff/volunteers on the *process* of science discovery (inquiry), and on helping youth develop and practice *4-H Science Abilities.*

5. *Remind trainees often that they are "co-learners" with youth.* Program staff/volunteers must be willing to explore and learn together with youth. This principle can be especially difficult for staff/volunteers coming from the formal education system. One way to circumvent the tendency for facilitators to want to provide answers (transfer of knowledge) is to engage youth in "real" community-based projects that do not yet have a solution (science discovery)!

6. *Remind trainees that the goal is to help youth develop an interest in science and to begin thinking like scientists.* It is much more important for youth to discover/observe what is happening, and process it in their own terms, than for them to be stifled because they do not know the correct scientific vocabulary. Encourage trainees to let youth make up their own science words to explain their observations (e.g., "uppy bit," law of conservation of "oomph," etc.).

7. *Help facilitators see youth as scientists doing science.* The use of appropriate, inquiry based curriculum will reinforce this concept, as will encouraging facilitators to provide youth with opportunities to engage in authentic tasks (e.g., GPS/GIS community mapping, water quality testing, etc.). Remind them that the youth are more likely to see themselves as scientists *today* if they are treated like scientists - *today!*

8. *Stress the importance of the teaching environment when delivering informal science education.* Learner understanding and comprehension will increase if youth are physically and emotionally comfortable in the educational setting. Advise facilitators to choose activities and teaching strategies that complement both the setting (e.g., indoor or outdoor, tables and chairs or just chairs, morning or evening, etc.) and the relationships (e.g., familiar with each other or not, mandated to be present or voluntary, etc.).

9. *Remind facilitators it is okay* **not** *to complete all activities during a session.* Again, the focus is on the processes, not the activities. Facilitators should allow ample time during and after the activity for youth to explore, ask questions, share thoughts and information, reflect, and so forth (see also *Item #3* under *Program Planning and Evaluation* in <u>Inquiry Based Learning Approaches</u>).

Supporting and Recognizing Program Staff and Volunteers

1. *Build relationships with program staff and volunteers.* A connection with those who are delivering the program means they are more likely to ask for assistance when help is needed. A personal knowledge of program staff/volunteer needs will help inform the kinds of support and professional development opportunities provided to them.

   - Be positive and affirming. Provide lots of encouragement. Reiterate *Item #4* under *Program Delivery – Professional Development Opportunities* above.

   - Remind staff/volunteers periodically of the benefits of their contributions. All volunteers are vital, however some may not realize how much their input makes a difference.

2. *Allow new facilitators to progress from trainee to trainer over time.* Ideally, a model training program will

allow facilitators to develop their skills in a structured, supportive environment.

- Following initial orientation and training, a new facilitator should attend a program session as a participant-observer.

- After the new facilitator has attended the program as a participant, she/he should be teamed with an experienced facilitator to co-facilitate a program session (see also *Item #3* below).

- After the new facilitator has co-facilitated a program session, he/she leads his/her own program session.

- As the final step in the process, the not-so-new facilitator is ready to train others in future training sessions, and co-facilitate with or mentor new facilitators (see *Enfield* in the *Case Studies* below).

3. *Partner new and inexperienced facilitators with experienced facilitators.* This has proven to be an excellent method for further "on-the-ground" training of new facilitators. Experienced facilitators act as role models and mentors. This pairing lessens anxiety in general, and helps to effectively deal with questions from program participants. The seasoned facilitator may also help assess whether the new trainee is on the right track and can intervene early to help extinguish unwanted habits, while fostering positive techniques.

4. *Follow-up coaching and "checking-in" is important.* Periodically meet with facilitators to ascertain how they are faring, and to review curriculum and activities with them. Facilitators should not be left on their own for long periods of time without staff contact.

- Conduct field observations, and provide facilitators with feedback regarding inquiry based learning effectiveness.

- Use an observation tool (e.g., *NPASS2 Afterschool Site Observation Form*, see *Resources* below) in order to provide specific feedback and support.

5. *Provide opportunities for inexperienced staff and volunteers to shadow experienced staff facilitating a program.* People model what they see, so if at all possible find ways to incorporate shadowing into a comprehensive training program.

6. *Create a learning community to support program facilitators.* Foster sharing among facilitators. Provide them with adequate opportunities to practice teaching each other for immediate feedback. Use technology (e.g., e-mail, blogs, conference calls, etc.) to cut down on travel expenses of learning community members, and help them become immediately accessible to each other for support and problem-solving around programming issues.

7. *Provide access to appropriate 4-H Science and inquiry based learning resources.* Sometimes program facilitators may need/want additional materials to support the curriculum provided. Help them locate high quality resources based on the program's educational goals. Ensure the facilitator understands how to effectively use these resources "as is" or adapt them to meet their specific program needs.

8. *Provide materials kits at the training, along with lists for consumable items.* This will reduce a major barrier to implementation, as staff and volunteer facilitators may or may not have the time or the resources to pull together materials needed for program implementation. Providing the same materials to all facilitators also increases chances for fidelity of implementation. Instruction for using the kits should be covered in the trainings. Use inexpensive and readily available materials to keep costs to the implementation sites at a minimum.

9. *Recognize successes within a reasonable timeframe after program completion.* Assess the impact of a program shortly after program completion to show those involved the effects of their contribution(s).

- A small recognition should be immediate and informal to provide some needed feedback.

- Many programs have an annual or bi-annual volunteer awards ceremony which makes for a nicer event, but this may delay recognition.

- Provide recognition to program/collaborating staff by including them in award nominations, program showcases, press releases, and so forth.

10. *Recognize and reward program volunteers regardless of the type of service.* All volunteers should receive the year pins and certificates that traditional 4-H volunteers (club leaders) receive and should be honored at the annual 4-H Achievement Night for service years. They should also be eligible for all other forms of recognition and incentives offered to 4-H volunteer leaders and facilitators (e.g., scholarships to attend 4-H Conferences, invitations to co-present at meetings and national conferences, nominations for State and National Leader Awards, profiles in the local media for their contributions to youth and families, etc.).

Case Studies

Bird – Increasing Staff and Volunteer Confidence and Competence for Success. Each year 4-H trains roughly 30 to 60 teens and adult coaches in the *4-H Youth Experiences in Science (YES)* Program, 25-35 teens and adults as 4-H On the Wild Side staff, and 20 Sacramento START program leaders in the 4-H Water Wizards Program. Trainings contain a variety of elements. All include material on inquiry based teaching and the processes involved in doing science. For *YES* and On the Wild Side, teens and adults learn about working with youth. When projects require teens and adults to work together, sometimes they are also trained in youth-adult partnerships.

In all instances, the trainings are hands-on. Participants learn through activities, discussion, experiencing concepts (like the processes in science), and demonstrating what they'll be teaching to youth. PowerPoint is never used! Science is about doing, so that kind of teaching is modeled. Some trainees have negative feelings about science. Some are scared or unsure that they are capable of teaching it. Some people are overconfident and lack background in how and what to present. Science does not feel accessible for some; it's seen as something complex. In order to reach urban populations, trainees need to see that they can, indeed, do science, that it requires nothing more than a mindset, and that it can be enjoyable. Training evaluations and observations indicate success in helping participants come away from the trainings with three things. First, participants better understand the process of science. Secondly, they feel more secure in the content area they'll be teaching. And thirdly, they feel a sense of confidence and enjoyment in the teaching process. **-Marianne Bird, University of California**

Edwards - Building Capacity for 4-H Afterschool Success. Jackson County 4-H Afterschool is focused on program delivery through contracted staff members and volunteers. The largest program efforts are under contract with the Local Investment Commission (LINC), the major provider for afterschool programs in the Kansas City area. This contract is funded through a 21st Century Community Learning Center grant – providing funding for six 4-H associate staff members to deliver informal education programs at 11 afterschool sites (reaching 600 afterschool 4-H members). 4-H also provides leadership for training and implementation of 4-H Science for these and other sites. Successful trainings have included multiple delivery methods. Baseline trainings are provided in the area of positive youth development. In 2010, with support from the National 4-H Council and MetLife Foundation 170 afterschool providers from 11 school districts attended a day-long Power UP! Your After School Professional Development Institute. Power UP! sessions primarily fall into three areas: (a) informal science education principles, (b) positive youth development, and (c) project based learning (including Aerospace, GPS/GIS, and NPASS2 cur-

ricula). The monthly training schedule includes Great Science for Girls (12 hours), NPASS2 (9 monthly - 3 hour sessions), *4-H Wonderwise*, and Afterschool Universe (8 hours). "Learn by doing" facilitation, conducive scheduling, and certified training hours are keys to Jackson County 4-H Afterschool training success. **-Beth Rasa, University of Missouri**

Enfield – Progressive Responsibility and Peer Support for 4-H Science Facilitators. All 4-H SLO SCIENTISTS facilitators participate in hands-on orientation and training that reinforces the key components of the 4-H SLO SCIENTISTS instructional model and the use of 4-H SLO SCIENTISTS materials. A goal of the facilitator training is to enhance fidelity to SLO SCIENTISTS principles of constructivist education used by inquiring youth/adult teams in the numerous hands-on inquiry based experiences, as well as how this all fits together in a framework of positive youth development. It is critical to train potential facilitators in inquiry based learning before they begin facilitating their first SLO SCIENTISTS session. The training session needs to model inquiry learning approaches, offer numerous opportunities for hands-on practice with activities, and include ample time for reflection. Questioning techniques, including open-ended vs. closed questions, is also important to address in the initial training.

Training strategies include regular opportunities for reflection and improvement. In addition, peer-facilitator assistance helps to further reinforce fidelity to the model. After initial orientation and training, facilitators first attend 4-H SLO SCIENTISTS sessions as participant observers, then assist experienced facilitators with sessions, then lead their own 4-H SLO SCIENTISTS sessions with experienced facilitators assisting them, and finally lead their own group sessions of 4-H SLO SCIENTISTS. Reflection and mentoring to improve skills and ensure the incorporation of positive youth development concepts is an ongoing process throughout each step of the training model. This allows the facilitators to have the experience of learning by doing through their own continuity, interaction, and reflection. This training strategy, employed from the start of the 4-H SLO SCIENTISTS program, has shown itself to be very effective in preparing volunteers for service as 4-H SLO SCIENTISTS facilitators. **-Richard Enfield, University of California**

Warner – Multiday Training, Ongoing Technical Assistance, and Site Visits. Cornell University Cooperative Extension 4-H in NYC in partnership with the New York City Department of Youth and Community Development (NYCDYCD), Cornerstone Hydroponics Science Education Food Production After School and Summer Program trains the two Cornerstone Project staff from each of the 25 Cornerstone sites throughout NYC's five boroughs, in the *Grow with the Flow* curriculum for three full days. This 24-hour core training is supplemented by technical assistance during the winter, spring, and summer during implementation, and is supplemented by observations and on-site coaching. Participation in the three-day training is critical to the program's success. Each of the ten sessions includes background information for group leaders/educators and activities for youth. This information, presented in a concise and easily understood manner, serves two purposes: (a) it helps clarify the facilitator's understanding of the scientific principles, and (b) it can be used as an outline for teaching young people. Youth are provided with seeds to grow edible crops such as basil, Chinese cabbage, and lettuce, while exploring fundamental concepts in applied and biological sciences, technology, and environmental studies.

The *Grow with the Flow* curriculum can be supplemented and expanded with curriculum elements from the larger Hydroponics Learning Model. The Hydroponics Learning Model curriculum consists of over 30 sessions that help the facilitator and youth design, implement, and monitor nutrient drip flow technique (NDFT) hydroponics systems such as that explored in the *Grow with the Flow* program. **-Philson Warner, Cornell University**

Resources

4-H Science 101 – this training guide provides four hours of activities that will help introduce your staff and participants to the development, delivery, and assessment of 4-H Science programs. Available at *http://www.4-h.org/resource-library/professional-development-learning/science-training-guides-resources/*.

4-H Science Professional Development Toolkit – an online set of resources and training activities to be used by youth development professionals and volunteers to prepare them to support their 4-H Science programs. Includes sections on the 4-H Science Checklist, 4-H Science Competencies, Experiential and Inquiry-Based Learning Methods in 4-H Science, Recruiting and Developing 4-H Science Content Rich Volunteers, Recruiting and Developing Traditional Volunteers in 4-H Science, Tools and Resources for 4-H Science Professional Development, and Communities of Practice. Available at *http://www.4-h.org/resource-library/professional-development-learning/science-training-guides-resources/*.

Afterschool Training Toolkit - research-based practices, sample lessons, video examples, and resources to support academic enrichment in afterschool settings. Available at *http://www.sedl.org/afterschool/toolkits/index.html*.

Guide to Professional Development of Out-of-School Science Activity Leaders - the tools and articles provided here describe a model for how to engage out-of-school activity leaders in professional development around science and engineering activities for youth. Based on a successful NSF-funded program called the National Partnerships for AfterSchool Science (NPASS), it describes an approach to out-of-school programming where science is complementary to what happens in school, and the activities and projects used with youth are accessible to most program leaders. Available at *http://ltd.edc.org/resource-library/guide-professional-development-out-school-activity-leaders*.

NPASS2 – National Partnerships for After School Science – includes best practices for afterschool science for science project leaders along with many other informal science education resources and professional development tools for OST. NPASS2 is led by the Center for Science Education at EDC. Available at *http://npass2.edc.org/*. The NPASS2 Afterschool Site Observation Form and a Science Trainer Reflection Form are available at *http://npass2.edc.org/forms-and-tools-data-collection-and-feedback*.