Professional Development Situation: Training

Skill Focus: Making Connections to STEM Careers

Time Required: 90 Minutes

IDENTIFYING POSSIBLE STEM CAREERS

Participants will watch the "Bringing in the Experts" video-based learning module and explore soil ecology to learn to connect STEM careers to OST activities.

Agenda

Welcome— 5 minutes

Introduction— 15 minutes

- STEM Careers "Find Someone Who"

See the Skill in Action— 15 minutes

- Bringing In the Experts video-based learning module

Hands-on learning— 40 minutes

- Exploring Soil Ecology guide

Conclusion— 15 minutes

Materials

- Computer with Internet connection
- Projector and speakers
- Flip chart paper and markers
- Pens for participants
- 3 x 5 cards for participants
- One copy of STEM Careers "Find Someone Who" for each participant.
- Bringing In the Experts video-based learning module
- One copy of Exploring Soil Ecology guide for each participant.
- Materials for Exploring Soil Ecology guide
    - Jam Jars (2 per group)
    - Soil (Different varieties)

- Labels or tape
- Water
- Sticks to stir (1 per group)
- Tape measures

Before the Session

- **Read this training guide** to become familiar with the content and allow time to personalize the activities to best suit your presentation style. Watch all videos and read informational materials.
  - *Italics indicate text that can be read aloud or emailed to participants.*
- Send reminder email about the training. Determine if any participants require accommodations (sight; hearing; etc.).
  - *The next professional development opportunity to enhance our STEM skills will be on DATE at TIME at LOCATION. Our focus for this session will be "Making Connections to STEM Careers". Let me know if you require any accommodations to participate in the training. I am happy to answer any questions you have and look forward to seeing you at the workshop. I can be reached at CONTACT INFO.*
- Gather all materials needed for the training.
- Develop a list of possible questions participants might have during the training. Create potential responses to be explored through informal conversation. Review any key terms or ideas that may be unclear.
- On the day of the training, test the audio and video equipment.

Training Outline

Welcome (5 min)

- Greet participants as they arrive. Make sure everyone feels welcome and comfortable.
- Introduce yourself and the focus of the session: "Connecting to STEM Careers".
- Ensure participants are aware of the locations of restrooms facilities, refreshments, etc.

Introduction (15 min)

- Hand out the "Find Someone Who" handout. Ask participants to find other participants who can tell them about the careers on the table.
- Give participants ten minutes to fill out the table. Once the ten minutes are over, ask participants these questions:
  - *How are these connected to STEM?*

- *It is not only important for youth to see possible careers out there, it is important for them to identify a person who has a similar career. It is also important for youth to see people like them in STEM careers. How do you introduce STEM role models to youth in your program?*
- *Think about STEM careers you have introduced to youth. How did you decide to share this career with youth? How did this career area complement the other activities you were leading with youth at the time?*

See the Skill in Action (15 min)

- Introduce the video.
  - *In the video, we will see one strategy for introducing career roles as a part of the activity structure. You will have an opportunity to explore this strategy as well as other strategies for making career connections. Strategies can be used in any activity and should be applied to all career possibilities.*
- Show the introduction video so that participants can learn about the Soil Analysis activity. Bringing in the Experts video-based learning module. Ask participants if they have any questions regarding the activity.
  - *What does Andrea say to connect the activity to the career?*
    - (She says "What can a farmer do with this kind of soil?")
- Show the Skill Video in Step 3.
- Play the video again as needed. Pause for participants to respond; then debrief using the reflection questions as a guide:
  - *What does Andrea do to help introduce STEM role models?* (Listen at 0:39)
  - *How does this reinforce a STEM identity in youth?* (Listen at 0:49)
  - *How does this encourage all students can be contributors to STEM*? (Watch and listen at 1:10-1:37)
  - *What does Andrea say that encourages a "real world" application for youth?* (Listen at 1:38)
  - *What are different strategies to connect STEM careers to activities in your program? How could you use the strategies in the video in your program?*
- **Note**: As discussion continues, you may want to **revisit the video** as questions arise.

Hands-on Learning: Exploring Soil Ecology (40 min)

- Participants will now do the Exploring Soil Ecology activity. Hand out the Exploring Soil Ecology guide for this activity, which includes a pie chart worksheet.
- **Read** through the instructions together as a room:

- *Take a clean, straight-sided jam jar and fill it about a third of the way up with the soil with which you are experimenting. Also, have ready another jar of clean water and a stirring stick.*
- *Now, add the clear water until the jar of soil is almost full. First, just watch the mixture for a while - do you see air bubbles rising? How much air is there in soil? Now, stir up the mixture and leave the jar for 2 or 3 hours for the contents to settle out and the water starts to clear.*
- *When the water settles, different layers should appear. Sand particles are the biggest and weigh more than silt - so the bottom layer will be the sand part of the soil. Any pebbles will also be at the bottom. Next up is the silt layer. Silt particles are smaller than sand and weigh less so they appear over the sand. If you were able to separate out any clay particles they are the smallest and will be on top. Organic plant materials will be on top.*

- **Give participants time** to complete the Exploring Soil Ecology activity and create their pie charts. They will use a ruler and colored pencils to complete the pie chart.
- Reflect with the group:
  - *How could careers be included in this activity?*
  - *Who is a career role model you could share with youth related to this activity?*
  - *Are there activities you lead that could be formatted this way?*
  - *What are other ways you integrate careers into activities and experiences you lead with youth?*
  - *How is integrating careers into an activity, as we did today, different than a separate conversation or activity dedicated to careers?*
  - *How do you identify and share STEM role models with youth?*

Conclusion (15 min)

- Ask participants to review their "Find Someone Who" game from the beginning of the session. Ask them to circle or color in any careers that might be connected to the soil ecology activity.

After the Session

- Within 2-3 weeks of the training, email participants:
  - *Thank you for your participation in the recent "Making Connections to STEM Careers" training. I hope you found it useful. Attached are some strategies used to support documentation of STEM. Consider meeting with a co-worker, supervisor, or friend to share the goals you are working on. I look forward to continuing our learning at the next session on SKILL/FOCUS on DATE at TIME at*

LOCATION. Please let me know if you have any questions. I can be reached at CONTACT INFO.

Want to Earn Credit? Click2Science has teamed up with Better Kid Care to provide continuing education units. Check it out at: http://www.click2sciencepd.org/web-lessons/about

STEM Careers "Find Someone Who"

Find someone who can tell you what each of the STEM careers on this list are. Have them initial in the box next to the STEM career after they tell you about that career.

Ethical Hacker	Space Agency Biostatistician	Underwater Archaeologist	Nanotechnology Engineer
Flavor Technologist	Nuclear Medicine Technologist	Herbologist	Actuary
Data Scientist	Economist	Bioenergy Engineer	Industrial Psychologist
Structural engineer	Pathologist	Software Tester	Biochemist
Pharmaceutical Engineer	Epidemiologist	Skate park engineer	Marine virologist

Read more at http://mentalfloss.com/article/85922/8-incredible-stem-careers-you-didnt-know-existed

Resources: Making Connections to STEM Careers

Frontline staff and volunteers in out-of-school programs need to help youth connect the activities they do on a daily basis to real-life careers and pathways so that they can navigate into a satisfying career.

Connecting youth to careers in STEM includes four important pieces:

Youth need **STEM career role models**. Through posters in the learning space, video clips shared in activities, guest speakers/experts brought in from the community and hosts of field trip experiences, youth need to see diverse individuals (younger and older; highly educated and vocational school grads; men and women; diverse races and ethnicities; and people that work in offices, laboratories and out in the field). Through these characteristics, individual youth are more likely to see themselves in those STEM roles.

Identify STEM career opportunities connected to activities being led with youth. As frontline staff members are preparing to lead STEM activities with youth, one preparation piece should include career-focused information related to the activity. The tasks completed and knowledge applied in hands-on learning experiences are often similar to tasks completed by STEM professionals every day. An activity in which youth design water filters relates to environmental engineers. Activities in which youth observe, classify or manipulate animal behavior relate to animal scientists, veterinarians, zoologists and others. If youth are asked to study soils or rocks, they are doing similar tasks to those required of a geologist, soil scientist or farmer. STEM professions are broad and, in some cases, somewhat obscure. Helping youth see real-world choices related to activities they enjoy doing can help them see themselves in those careers. Youth need exposure to and assistance with **career pathways**. Youth may identify with a career choice but have no idea how to get from where they are to where they want to be. Choices along a career pathway include classes to take in middle and senior high school; technical school or college; specialized training; extracurricular experiences; and part- time employment, job shadow or internship opportunities. When interacting with youth, frontline staff can integrate career pathways into conversation and activities. In doing so, it is important to include careers that require differing levels of education.

Not all STEM careers require advanced college degrees. It is important to **include examples of STEM careers on all levels of the education spectrum**. Not all youth are able to pursue a career as a veterinarian for academic, financial or other reasons; however, a youth interested in helping animals may be interested in a career as a vet tech or feedlot worker or humane society caretaker, etc. These career choices may require only a high school diploma, a vocational or community college certificate or degree, or a bachelor's degree.

For additional information about career pathways and an interactive experience for youth, visit http://careerexplorer.unl.edu. Career Explorer also is available from the iTunes Store and the Google App Store for use on mobile devices.