



[Session 1](#) [Session 2](#) [Session 3](#)

Goals

Questions are the beginning of a path towards discovery, imagination, and STEM exploration. 'Purposeful' questions are well-placed questions that help youth expand and clarify their thinking, develop their reasoning and navigate science and engineering experiences with sharpened intentionality and focus.

The learning goal for this ACRES Module is for educators to be able to use well-placed questions to facilitate STEM learning and help learners understand what they should focus on and where they should go next.

Overview

Afterschool Coaching for Reflective Educators in STEM (ACRES) is a professional learning opportunity for after and out-of-school providers who want to embrace STEM education more deeply.

ACRES modules introduce educators to select STEM facilitation skills through contextual STEM activities, videos, reflection, and discussion. The strategies and techniques educators encounter can be readily put into action in their own STEM programming.

The Asking Purposeful Questions module takes place over three two-hour sessions. In the first session, educators will participate in a water filtration activity as they deepen their understanding of the power of purposeful questions. The activity serves as the context for educators to practice the skill of asking questions as they clean up dirty water. They will practice giving feedback and analyzing videos of the skill in action.

When participants return to their programs, they will record a video clip of themselves practicing the skill as they work with youth. Video clips are then shared and discussed with the coach and peers in sessions two and three.

Intended Use of this Guide

Module Guides, such as this document, are intended for coaches and other afterschool leaders to use as they coach cohorts of afterschool and library educators in STEM facilitation skills. ACRES cohorts are most often held virtually using Zoom video conferencing, however, adaptations can be made for in-person or hybrid in-person/virtual coaching.

Since the Asking Purposeful Questions module is foundational we recommend participants complete the three-session module prior to enrolling in other modules. All ACRES modules integrate the foundational skill of asking purposeful questions with additional skills and in new contexts.



Session 1



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Session 1 at a Glance			120 min.
Part 1.	Introductions and ACRES Overview	Community Builder	20 min.
Part 2.	Introduction to Purposeful Questions	Video 1: Parachutes Breakout Discussion	20 min.
Part 3.	Experience Purposeful Questions in the Context of a STEM Activity	Water Filter Activity	30 min.
Part 4.	See the Skill in Action	Video 2: Using Questions for Many Purposes	20 min.
Part 5.	Practice Formulating Purposeful Questions	Video 3: Library STEAMs Ahead With Creative Program (<i>What would you do?</i>) Practice PQs with water filters	20 min.
Part 6.	Conclusion and Next Steps	Review assigned task Final Reflection	10 min.

Preparation

- ☐ Become familiar with this Module Guide and the Coach's Guide for additional facilitation tips.
- ☐ Preview and queue videos and handouts
- ☐ Prepare a sample set of participant materials
- ☐ Make a copy of the [Sample Community Agreements](#) document if you will be using it
- ☐ Email participants with meeting details and materials ([Sample Emails](#))
- ☐ Set up the platform (e.g. Google Drive Folder) where participants will share their video clips

Participant Materials

When facilitating virtually, have participants gather a set of materials and prepare a sample set for yourself.

Two-liter plastic soda bottle. Cut the soda bottle in half and invert the top half as a funnel into the bottom half.	Alternatives: a smaller plastic water bottle, two different-sized plastic/paper cups, a funnel, and a cup
Cotton balls	Alternatives: cotton batting, cheesecloth, gauze
Paper coffee filter	Alternatives: a piece of cloth, paper towel
Dirty water – a container of water with food coloring, dried beans, potting soil, cooking oil	Alternatives: juice or coffee, pebbles, dirt or sand



- Scissors
- Paper Towel for clean-up and spills



Participant Handouts

[HANDOUTS FOLDER](#)

Participant Agendas

Asking Purposeful Questions: An Overview

Asking Purposeful Questions: The Process

Feedback Tips for Asking Purposeful Questions

Session Videos

[YOUTUBE PLAYLIST](#)

Video 1: [Tracy - Purposeful Questions - Parachute](#) (password: tracy)

Video 2: [Using Questions for Many Purposes](#)

Video 3: [Library STEAMs Ahead with Creative Program](#)



Session 1 Activities

Part 1: Introductions and ACRES Overview	
Activity with coaching notes	Suggested Prompts & Talking Points
1. Welcome participants <i>As participants join the workshop, welcome them and Review any logistical items (e.g. surveys, materials).</i>	We'll start by introducing ourselves, including where you're from and your role in afterschool education. Remind all to display preferred name and pronouns.
2. Zoom orientation <i>Orient them to the space – whether virtual or in person.</i>	Let's take a look at some of the Zoom features we'll use today: mute, stop video, rename, use chat bar, toggle gallery/speaker view, share screen, and use breakout rooms.
3. Facilitate a Community Builder <i>Creating a culture that is supportive and brave is key to a productive ACRES session. Facilitate a community builder activity to break the ice and connect to the session's topic. Be sure to keep in mind the purpose of the community builder is to create swift trust so participants feel comfortable sharing. Adapt one of the sample community builders or one of your own to fit your group.</i>	Sample Community Builders [Add the community builder you will use]
4. Provide an overview of ACRES <i>Make the following points, adjusting the messages to fit your group</i>	– This group will work as an ACRES cohort to learn the skill of asking purposeful questions. We will meet together to learn and then practice over the course of the follow-up sessions. – This module is in three parts. – Today, we'll lay the foundation for the skill of asking purposeful questions. We'll practice asking purposeful questions with each other before you go back and practice and capture it on video with youth (we'll brainstorm new strategies for this). – During our second session, we will share our videos, and both give and receive constructive feedback.



	– During session three, we'll share feedback on a second round of videos. This time you'll have had the opportunity to enact the feedback you received in the second session. Once you complete the Asking Purposeful Questions module, you can sign up for additional skills offered including, Facilitating Science Practices, Facilitating Engineering Practices, Facilitating Mathematics, Exploring Youth Understanding, Giving Youth Voice and Choice, Nurturing STEM Identity and Careers, and Virtualizing Your Offerings. – At the heart of ACRES is reflecting on our own personal practice and committing to move ourselves to the next point. Keep in mind we all have very different backgrounds and experiences, but we should not feel intimidated by any of those differences. By being here, we have made a commitment to learn and coach each other, give support and give opportunities to stretch. The purpose of ACRES is to strengthen and improve our practice through collaborative learning with colleagues. – Some of the resources we'll be using were developed by the Click2Science (C2S) project. The ACRES modules and skills have been informed by national standards documents such as Common Core State Standards (CCSS) and Next Generation of Science Standards (NGSS).
5. Provide an overview of today's session.	Today's workshop session will include: – Sharing our ideas and experiences around questioning – Thinking about questioning as a process – Practicing the skill of asking purposeful questions – Discussing how to capture and upload video in preparation for our next session
6. Establish Community Agreements <i>Option 1 - have a list of community agreements prepared and have the group discuss or use a shared document to copy and paste which ones they want to prioritize with room for others that aren't listed, sharing why they are important to them.</i> Sample Community Agreements	What would make this cohort a supportive and brave space for learning?



Option 2 - have participants list community agreements, making it visual for everyone by using the chat or another shared space

Option 3: If this group has previously-established community agreements, bring those into the discussion.

Part 2: Introduction to Purposeful Questions

Activity with coaching notes	Suggested Prompts & Talking Points
1. Offer community agreements for reviewing videos	Watching videos of others is a big part of ACRES work. We'll use the following video viewing community agreements: - Watch the video as if the people in the clip were in the room with us. - Provide feedback in a manner that will help educators stretch and grow. Feedback that is evidence-based and specific to the skill is the most effective. Remember, in ACRES we are working to build a 'supportive and brave' space with the goal of respectfully pushing each other to become better educators.
2. Share a video clip <i>The purpose of sharing the clip is to help participants think about the types of questions that can be asked and to recognize that there is an opportunity for the facilitators, other adults, and youth to ask focused, more meaningful, open-ended, 'purposeful' questions.</i>	While you're watching, jot down the questions you hear being asked and also make note of the types of responses the youth give. SHARE SCREEN & SOUND Tracy - Purposeful Questions - Parachute
3. Discuss the video clip <i>Ask participants to share the questions they heard being asked of youth in the clip. You can support the discussion by sharing the transcribed questions in the chat.</i>	What questions did you hear being asked of youth in the clip? What did you notice about how youth responded to the questions posed? (e.g. Were youth providing one-word answers or deeper, more thoughtful responses?) PASTE IN CHAT Below are some of the questions asked in the clip:



	- So you were dropping it more slowly, and what did you notice about how it behaved? - What's frustrating you right now? - What are you thinking about using to make it stay better? - What's your thinking here? Tell me how it's going to happen. - I'm noticing that you have a twisty and a string, how are you going to put those together?
4. Define Purposeful Questions and share handout	We think about purposeful questions, especially in STEM settings using Click2Science's definition: Purposeful questions are well-placed questions that drive STEM experiences while helping learners understand what they should focus on, and where they should go next. Purposeful questions can be used to: - better understand participant knowledge and thinking, - build relevance to youth lives, the broader world, and to STEM careers which are all an important part of building a person's STEM identity. Handout: Asking Purposeful Questions: An Overview
5. Discuss Purposeful Questions <i>Expect that participants will have a variety of responses. Often participants will report that they sometimes think ahead of time about the questions they will ask in a lesson and do some planning. Acknowledge that it's impossible to preplan all the questions that could be asked but that planning a few key questions and anticipating youths' responses to them deepens learning.</i>	BREAKOUT ROOMS In your breakout rooms, discuss: How intentional are you with your questions?
6. Share the Asking Purposeful Questions as a Process handout. <i>Briefly walk through the components of the process outlined on the handout and provide an overview of each of the components.</i> <i>Consider offering different examples of wait time.</i>	Handout: Purposeful Questions: The Process In ACRES we approach purposeful questions as a process: - Identify a specific purpose or goal for the activity. Why are you doing this lesson? What's the main takeaway you have for youth? - Plan some of the questions to ask that relate to this purpose.



- 1) Wait time can be useful not only after an educator has asked a question, but also after the youth answers (perhaps they will add more or another person will chime in).
- 2) Educators could also practice wait time after youth ask a question, giving other youth and themselves time to think.
- 3) In a group setting, educators might pose a question, and say "We'll take one minute of think time before you turn and talk about the question with the person next to you."

- Anticipate responses but also remain fluid. Be ready to ask a second or a third follow-up question.
- Think about how you're trying to move youths' thinking. There are many reasons to ask questions, two we emphasize are 'nudging youth' and 'broadening ideas.'
- Practice 'wait time.' Giving youth time to think deepens their thinking.
- Listen to responses actively and be ready with questions to ask as follow up on their thinking.

This process is what you'll be practicing and recording to share during our next session.

Part 3: Experience Purposeful Questions in the Context of a STEM Activity

Activity with coaching notes	Suggested Prompts & Talking Points
1. Introduce the Water Filter Activity.	Next, we will be engaging in a water filter activity to provide a common experience for the group to discuss the skill of 'asking purposeful questions.' This also provides an opportunity to experience it from the learner's perspective before conducting it with youth in their program.
2. Facilitate the Water Filter Activity with participants, as one might with youth. <i>The goals of this activity are to:</i> - examine the properties of various materials - use the materials to design a filter to clean up dirty water <i>The intended outcome for conducting the Water Filter Activity with afterschool educators is for the coach to model asking purposeful questions. The activity then becomes the vehicle for educators to practice stimulating thinking in their youth. Be sure to place the emphasis on the skill of asking purposeful questions and not on the activity outcome or youth success. You may find it is helpful to ask participants to take on the role of youth as they design and build their filters.</i>	What do you think are some reasons why water in a community may be dirty? Share briefly about Flint, Dakota Access Pipeline, and/or the Global Water Crisis. (e.g. According to Unicef, "In 2020, around 1 in 4 people lacked safely managed drinking water in their homes.") If you haven't already mixed up your dirty water, go ahead and mix the food coloring, dried beans, potting soil, cooking oil, or alternatives into your water. We add food coloring to represent chemicals, dried beans to represent solid waste, potting soil to represent earth, cooking oil to represent motor oil.



As you visit breakout rooms, model asking purposeful questions. In particular, model questions that aim to surface and clarify participants' thinking around the properties of the materials in relation to their effectiveness as filter materials.

- *What are some of the properties of these materials? How do you think they'll work with the substances we need to clean up?*
- *What do you know about these materials that makes you think that?*
- *How will layering the materials influence your water filter? Why are you thinking that?*
- *How do you think the materials will work together?*
- *Tell me more about why you chose to use this material.*
- *What made you decide to design your filter this way? How do you think your design is going to work?*
- *How is your design different from ___'s design?*
- *What materials do you wish you'd had to build your filter?*

3. Bring the activity to a close.

Participants will likely not be able to completely 'clean up' the dirty water. Let them know that this will also happen as they are working with youth and remind them that it is the process of asking questions, engaging in the thinking about things that could be done to clean the water and resulting discussions of how/why that might work that's important to future design, their lives, and to the broader world.

In breakout rooms, we will first examine and discuss the materials, before designing and building filters. I will visit the breakout rooms as you work.

BREAKOUT ROOMS of 3-4

Paste in Chat:

- **Discuss: As you examine these materials (the coffee filters, cotton balls, gauze), how do you think they will interact with the oil, solids (beans and soil), and dissolved substances (food coloring)?**
- **Sketch your filtering idea, labeling the materials.**
- **Build your filters, keeping track of any changes or improvements made to the original design.**
- **Wait to test your filters until we're back in the main room.**

RETURN FROM BREAKOUTS

Participants are now ready to test their filters.

What do you think will happen when the dirty water is poured through?

Let's have someone from each team briefly share their result:

What worked? What would you do differently next time? Why?

You can set aside your water filters and materials for use later.



Part 4: See the Skill in Action

Activity with coaching notes	Suggested Prompts & Talking Points
1. Share and discuss the Water Filter video. <i>Play the clip of Katie facilitating the water filter activity two times. The first time, participants will focus on observing the purposeful questions. The second time, participants will make note of feedback in the form of strengths and opportunities.</i> <i>You may find it helpful as the facilitator to have a copy of the questions that Katie asked and the learning goal she shares:</i> <i>Katie: So with your partner, the first step that you're going to be doing is you're going to be brainstorming how to make your water filter. You're going to build your filter in this top part. And then we're going to test it out as a group at the end to see whose filter does what.</i> • <i>What do you think the different functions might be?</i> • <i>Do you think they'll catch the same sized dirt?</i> • <i>Do you think the different sizes of the materials might affect it?</i> • <i>Can you talk me through what you were thinking here?</i> • <i>What do you see?</i> • <i>What do you think you could try to get rid of some of that yellow color.</i>	Next, we'll be watching a video of another educator, Katie, facilitating the water filter activity. We are doing this for two reasons 1) to see the skill in action and 2) to practice giving feedback. In the video clip, youth work on designing a water filter. You'll see them selecting materials, creating a prototype, testing, and refining their design –similar to the activity that was conducted earlier in this session. This video clip was put together by a professional film crew, has been edited, and is not 'typical' raw video footage of practice that we see from educators made in the field during ACRES. We're using it now to see the skill in action and practice providing feedback. SHARE SCREEN & SOUND During the first viewing, pay attention to how the educator in the video, Katie, guides youth by asking purposeful questions, especially those that are helping to nudge youth to think more deeply or pushing them to broaden their ideas. Play Video 2: Using Questions for Many Purposes What questions did you hear? What kinds of follow up questions did she ask? What did you notice about the way youth respond to her questions? Share and review handout: Feedback Tips for Asking Purposeful Questions Are there any other feedback tips you would add to this list?



	SHARE SCREEN & SOUND As we watch the video a second time, make note of both a strength and an opportunity for Katie with regards to the skill of asking purposeful questions. We're not looking at anything else at this time (e.g. behavior management, instructional flow, materials, the quality of the activity). Play Video 2: Using Questions for Many Purposes
2. Talk about the videos that participants will upload for the coaching session	Before our next session, you will be capturing and uploading video of yourselves practicing the skill of asking purposeful questions with youth. The videos are raw, do not need to be edited, not of perfect practice, or of perfect youth. Clips should be between 3-5 minutes long. You can choose to be in the video by having someone record you or setting your camera on a table, or you can hold the camera close to the youth. The main concern should be good audio so we can hear the purposeful discussions. You can choose the STEM activity you'd like to facilitate; it doesn't have to be the water filter activity, but it certainly can be. Remember you can use the purposeful question handouts to help you plan a few questions in advance for the activity. You may find it helpful to have a set of the question prompts to use while you facilitate. Although it may seem unnatural or awkward at first, this is normal and it will become more natural with practice. Remember to identify a main purpose for the activity before you plan. It's the process of uncovering what youth are thinking about and how they are justifying the decisions they're making that are important and not the end product or the 'right answer.'



Part 5: Practice Formulating Purposeful Questions

Activity with coaching notes	Suggested Prompts & Talking Points
1. Practice by Using Video: What Would You Do? <i>As participants share their questions, listen to see if the questions have the qualities of purposeful questions.</i>	We are going to watch a very short video clip and then take turns suggesting a purposeful question we could ask to better understand youths' perspectives and help build relevance between their lives and the activity. The question could be to nudge toward explaining thinking further or to clarify thinking. The clip is a news story showcasing STEM programming in the library. Youth are building something in the clip. SHARE SCREEN & SOUND Library STEAMs Ahead with Creative Program <i>Show the clip, starting at 1:32 and running through 1:51, pausing for purposeful question suggestions.</i> <i>Show the next section of the clip, starting at 1:51 and running through 1:59, pausing again for purposeful question suggestions.</i> You may have noticed that it's hard to think of questions on the spot, this is why we encourage you to think about some of your questions ahead of time - not all of them, but a few key questions related to the activity's goal can be helpful.
2. Re-Share Handout <i>Share Asking Purposeful Questions: The Process one more time to reinforce planning and asking purposeful questions as a process. As you talk about the handout again, reveal your goals and thinking as you modeled the water filter activity.</i>	When I was facilitating the water filter activity, my main goal was to get you to think about the materials and how you'd use them in your design. Then I was trying to nudge you to explain a little bit more, or when I asked you to say how your filter was similar or different to someone else's, I was trying to broaden your thinking to get you to compare designs. Wait time – tough but powerful! And then follow-up questions – how did you know, what's your evidence... pushing for justification and explanation.



3. Practice by Role Playing

Ask for a volunteer to take on the role of educator while the other participants role play as youth.

While the volunteer is practicing, jot down the purposeful questions asked.

Read back the questions that were asked by the volunteer educator and ask the group what they notice about the questions posed. Make suggestions as necessary to shift questions to be more purposeful.

e.g. Questions such as: Do you think you have similar results? Do you agree with that? are leading or confirmation questions that could potentially end a conversation if youth reply 'yes' or 'no.' Shifting the question to 'How are these similar?' and adding 'What's your evidence?' are questions with more power to engage youth's thinking.

Be sure to thank the volunteer for being brave

Now we're going to bring back our water filters for a little more practice with purposeful questioning. Remember the goal of that activity was for youth to examine the properties of various materials and use the materials to design a filter to clean up dirty water

For the next few minutes, we're going to have one volunteer take on the role of educator and the others, youth. The educator will practice asking purposeful questions for 2-3 minutes, and the youth will respond with their thoughts about their water filter engineering.

We'll continue with a new volunteer as time permits.

BREAKOUT ROOMS OPTIONAL

Part 6: Conclusions and Next Steps

Activity with coaching notes

Suggested Prompts & Talking Points

1. Conclusion and Next Steps

Bring the session to a close by asking participants to share their reactions to the purposeful question skill. Share the following tips:

- Asking purposeful questions may feel awkward at first but as you practice it will feel more natural.
- You might find that 'practicing' the skill with your own family and friends

What reactions do you have to the purposeful question skill?



first goes a long way in boosting your confidence and building comfort. • Build in time to do a little pre-planning prior to trying this skill out with youth.	
2. Review the video task for next time, <i>Remind participants of their video task for next time. This could be a good time to walk through the upload process on the platform you are using (e.g. Google Drive Folder or another sharing platform).</i>	Your task before next session will be to record a 3-5 minute video of you facilitating a STEM activity using the purposeful questions process with youth. Remember, we are not looking for perfect facilitation or perfect youth! The purpose of this course is to gain an understanding of how to be a community of learners, where educators can share, ask each other questions about their practice, and improve STEM facilitation skills. You can record your video on a phone or other device and upload it after you're finished. Let us know if you'd like support with the technology involved. Share the courtesy letter with parents/guardians of the youth you film. You do not need to get signatures, however the letter will inform them about the work you are doing. Don't hesitate to reach out to me or the group if you need any support in making your video. Please upload your video to _____ by _____.
3. Remind participants how to prepare peer feedback <i>Note that if the cohort is larger than 5 or 6 people, consider breaking the cohort into review groups where each participant is only preparing feedback for 4-5 other videos.</i>	As you watch one another's videos prior to the coaching session, prepare feedback for each person framed as a "strength and an opportunity" – one comment on what was done well and one suggestion for something to think about doing next time with regard to the skill. It's always nice to hear some positives but we learn more from insights that are evidence-based, specific and actionable. The most constructive feedback includes a question or suggestion of what the person might want to consider or try as a next step. You may want to refer to our handout: Feedback Tips for Asking Purposeful Questions



4. Facilitate a short reflection.

Reflection is an essential element of ACRES. Have participants reflect on their experience in today's session using the Rose, Bud, Thorn prompt. You can have each participant share aloud (speaking order suggested) or in the chat (privately to you or publicly to everyone).

CHAT or ALOUD

Reflecting on today's session, please share:**A rose - something that went well for you in today's session****A thorn - something that is a sticking point, or something that isn't resting easy for you****A bud - something that has you thinking about the future**

Session 2 & 3

The same agenda can be used for both sessions.



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Session 2 & 3 at a Glance			90- 120 min.
Part 1.	Re-introductions and Overview	Community Builder	15 min.
Part 2.	Community Agreements		5 min.
Part 3.	Breakout Discussion		10 min.
Part 4.	Video Review and Feedback	Video sharing process Closing reflection	60-90 min.

Preparation	
☐	Prepare feedback for each participant
☐	Email participants with meeting details and assignment reminders (Sample Emails)



Part 1: Re-introductions and Overview

Activity with coaching notes	Suggested Prompts & Talking Points
1. Welcome participants <i>As participants join the meeting, welcome them back and lead a community builder.</i> <i>Creating a culture that is supportive and brave is key to a productive ACRES session. Facilitate a community builder activity to break the ice and connect to the session's topic. Be sure to keep in mind the purpose of the community builder is to create swift trust so participants feel comfortable sharing. Adapt one of the sample community builders or one of your own to fit your group.</i>	We'll go around in ___ order. When it's your turn, you can re-introduce yourself. Community builder suggestions [Add the community builder you will use]

Part 2: Establish Community Agreements

Activity with coaching notes	Suggested Prompts & Talking Points
1. Review the community agreements that were established in Session 1. Sample Community Agreements <i>Ask participants if there are any community agreements that they would like to see added or removed.</i> <i>When you have participants choose a community agreement to focus on, you can choose to have them share it in the chat or write it down privately.</i>	[Add the community agreements from Session 1 here] Choose one community agreement you want to personally focus on for today's session.

Part 3: Breakout Discussion

Activity with coaching notes	Suggested Prompts & Talking Points
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1. Engage participants in a discussion about their practice of purposeful questions.

Depending on the group size, consider either using breakout rooms or holding the conversation as a whole group.

BREAKOUT ROOMS OPTIONAL

In your breakout rooms, discuss:

How are you incorporating purposeful questions into your teaching?

How are you feeling about incorporating purposeful questions into your STEM activities? What was the most challenging part?

How are you feeling about talking about your video recordings or lesson plans with the group?

Part 4: Video Review and Feedback

Activity with coaching notes	Suggested Prompts & Talking Points
1. Share the video-sharing process with participants	Each person will have the opportunity to share their video and receive feedback. – When it is your turn you will share the context of your video – We'll all watch the video – You may want to refer to our handout: Feedback Tips for Asking Purposeful Questions – Each person will share a strength specific to the asking purposeful questions skill – Each person shares an opportunity specific to asking purposeful questions – Finally, we'll circle back to you to hear your reflections on the feedback and what you would like to try next.
2. Review the videos <i>You can do this by sharing screen and sound, or by sharing the link and having participants watch it at their own pace.</i>	[Add your notes on sharing order and feedback here]



If participants do not bring a video to share, the following options can still provide in-depth reflections:

- *Ask participants to share a lesson plan they have done or plan to do, and give feedback on the purposeful questions involved in the activity.*
- *Choose from one of the example videos of educators facilitating STEM in the appendix below to practice giving feedback and/or see the skill in action.*

3. Conclusion and Next Steps

If this is session 2, remind participants of their second video task.

If this is session 3, take a moment to thank participants and share upcoming opportunities with them.

Session 2:

For next time, your tasks are:

- Reflecting on your feedback from our coaching session, practice purposeful questions a second time. Find a new STEM activity or build on the first one. Practice posing purposeful questions including wait time and follow-up questions. Record another 3-5 minute video and upload prior to meeting.
- If you are going to be filming with different youth, please share the courtesy letter with parents/guardians of the youth you film.
- You may want to refer to our handout: [Feedback Tips for Asking Purposeful Questions](#) when preparing feedback for session 3.

Session 3:

Thank you for participating in ACRES! If you want to continue with other skills, please check out the ACRES website for upcoming cohorts!

5. Facilitate a short reflection.

Reflection is an essential element of ACRES. Have participants reflect on their experience in today's session using the Rose, Bud, Thorn prompt. You can have each participant share aloud (speaking order suggested) or in the chat (privately to you or publicly to everyone).

CHAT or ALOUD

Reflecting on today's session, please share:
A rose - something that went well for you in today's session



A thorn - something that is a sticking point, or something that isn't resting easy for you
A bud - something that has you thinking about the future

Appendix A: Videos of Educators Facilitating STEM

These example videos may be used either as a way to practice giving feedback to educators on the STEM facilitation skill or as a supplement if there aren't enough videos to reflect on during the cohort. Please note that these are examples, not exemplars. In ACRES, it's not about perfection, it's about reflection and connection. Use these videos to reflect and connect more deeply on the skill of Asking Purposeful Questions.

Video Title and Link	Description
Asking Purposeful Questions Module	
Water filter design and predictions	Educator talks with a first-grader about her water filter design
Density observations	Upper elementary-age youth investigate density concepts through a simple floating and sinking activity
Density: wonders and experiment design	Upper elementary-age youth continue to investigate density concepts through a simple floating and sinking activity
Density: continued wonders and experimenting	Upper elementary-age youth continue to investigate density concepts through a simple floating and sinking activity
Testing motors	A librarian engages with two upper-elementary youth as they work on designing a car
Car design in the library	A librarian continues to engage with two upper-elementary youth as they work on designing a car
Engineering a parachute design	Upper-elementary youth work to redesign a parachute
Designing nests: engineering challenge	A librarian works with a group of neurodivergent adult men to solve an engineering problem
Tower Building: testing and redesign	A small group of elementary and upper-elementary youth in a library setting use notecards to build towers that can support a small stuffed animals
Bridge Building	Middle school aged youth builds a bridge.
Paper Drop Explorations	Educator talks with a first grader about how things fall.



M&M Estimation	Two middle-school youth estimate the number of M&Ms in a cylinder
Chocolate chip cookie math	Upper-elementary youth uses math to figure out how many cookies can be made from the cookie dough.
Cheese and crackers math	Elementary youth uses math to understand how to have enough cheese for the crackers.
Click2Science Videos	
Giving Youth Control During Computer Science Activities (Click2ComputerScience)	In a computer science activity, youth design and test algorithms, designing solutions on their own
Connecting Real-World Roles to Career Roles (Click2Science)	Middle school youth think about the different STEM careers related to wearable technologies design activity
Learning About Local Habitats (Click2Science)	Elementary-age youth learn about animals in a local habitat by going on a nature walk
Managing the Excitement of STEM (Click2Science)	Middle school girls work to solve a 'hazardous waste' engineering problem
Designing a Grape Smasher (Click2Science)	Youth are asked questions about their 'grape smasher' designs and make connections to STEM careers
Designing Investigations Using Ice Cubes (Click2Science)	Groups of middle school youth work to design an experiment with controlled variables
Sharing and Explaining Findings (Click2Science)	Youth work in small groups developing a graph and making sense of data from a soil investigation
Constructing Explanations (Click2Science)	Youth build a speaker to learn about electricity and magnetism
Sparking Interest (Click2Science)	Youth build and improve a marker robot
Using a focus question (Click2Science)	Educator uses a focus question to help youth orient to the STEM activity

Appendix B: Certificate of Attendance

Make a copy of the [Certificate of Attendance](#) and personalize for your participants based on their attendance.


Afterschool Coaching for Reflective Educators in STEM
a project of


This is to certify that

<<Participant Name>>

has participated in

Afterschool Coaching for Reflective Educators in STEM (ACRES)

Skill(s) Addressed: <<Skill>>

Dates: <<Dates>>

Contact Hours: <<Contact Hours>>

 JONES GAIN



Acknowledgment of Support: This material is based upon work supported by the National Science Foundation under Grants No. DRL 17131341 and DRL 2115229, as well as the Noyce Foundation, the STEM Next Opportunity Fund, and the Davis Family Foundation. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the funders listed above.

