DEVELOPING A GUEST SPEAKER ROUTINE FOR STEM PATHWAY SUPPORT

Leverage guest speaker visits to communicate affirming and practical knowledge about STEM college and career possibilities.

STEM PUSH seeks to broaden participation of Black, Latina/o/e, and Indigenous students in STEM. Pre-college STEM program leaders in this improvement network test out ideas to move us toward that goal.

These **evidence-based improvement packages** summarize our promising ideas, offering a collection of planning guides and resources so others may try out these changes.

Are you interested in improving STEM pathway support for Black, Latina/o/e, and Indigenous youth by maximizing interactions with guest speakers?

This improvement package offers ideas, tools, and strategies for embedding STEM pathway knowledge into guest speaker events. You will find:

- Ideas for centering students' interests and input to inform guest speaker recruitment and content.
- Examples of ways in which STEM PUSH pre-college STEM program leaders re-designed guest speaker preparation.
- Templates and tools with which to scaffold "sticky" guest speaker experiences.

Lift

An approximation of the amount of time it will take you to implement this idea.*

Leverage

An approximation of how much change you might expect to see in your program if you implement this idea.

02 The Challenge

- Programs do not always have the resources to engage in direct advising and counseling related to STEM college and career pathways. Guest speakers can communicate wisdom and knowledge about these pathways, yet they vary in their skill in connecting with students, and students' time with them is often limited.

02 The Change

- Seek and center student input on guest speaker recruitment and content.
- Provide explicit and intentional guidance to speakers on covering topics relevant to navigating STEM college and career pathways.
- Build in opportunities for students to reflect on guest speaker experiences.

02 The Improvement

- Increased student engagement with guest speakers
- Increased relatability of guest speakers to students
- Increased student understanding of the diversity and flexibility of STEM pathways
- Increased student confidence in pursuing STEM study and/or careers

03 Centering Equity

- Intentionally recruit guest speakers reflective of your student backgrounds.

03 The Routine

1. Facilitate an activity to gather student input on the types of STEM knowledge, experience, and topics they want to learn more about from a guest speaker.
2. Create a guide that communicates program goals and highlights key points for guest speakers to address.
3. Plan for intentional student reflection on guest speaker experiences.

References & Connections

Student interest survey template

"Would you rather" career exploration game

BEAM career exploration and interest activities

Guest speaker guide examples

Observation tools

Guest speaker reflection tools

Speaker Data Tracker

Share with Us

We would love to hear from you.

Tell us how this improvement package is supporting your work at www.stempushnetwork.org/contact-us/

Share on social.

Stay in the loop with our newsletter, and follow us on social media.

The Challenge

Programs often invite guest speakers because they know role models can have a significant influence on the possibilities students see for themselves in a given field. This is especially true for Black, Latine, and Indigenous students who are less likely to see people that look like them represented in STEM fields.

The challenge of facilitating guest speaker events includes not only finding speakers whose backgrounds and interests resonate with students, but also in prompting speakers to talk about what they do and how they got there in ways that make their path seem both appealing and attainable. Additionally, students often are not asked what they hope to learn from guest speakers; matching student interests to guest speaker recruitment and content enables students to better engage with and absorb the STEM pathway experience speakers have to offer.

The Change

- Seek and center student input on guest speaker recruitment and content.
- Provide explicit and intentional guidance to speakers on covering topics relevant to navigating STEM college and career pathways.
- Build in opportunities for students to reflect on guest speaker experiences.

The Improvement

- [ ] Increased student engagement with guest speakers.
- [ ] Increased relatability of guest speakers to students.
- [ ] Increased student understanding of STEM pathway diversity and flexibility.
- [ ] Increased student confidence in pursuing STEM study and/or careers.

The How Will You Know?

Sections throughout the package will offer examples of tools for measuring improvement.

Centering Equity

Who are the students in your program?

How many identify with racial/ethnic groups, gender identities, socioeconomic statuses, etc. that are minoritized in STEM?

What connections and networks does your program rely upon for recruiting guest speakers?

Have these sources yielded guest speakers in whom students can "see themselves"? Does your program seek out professionals who live in the communities your students come from (including friends and family members)? Are there additional connections, groups, associations, etc. your program could engage to expand your pool of guest speakers?

Why do you think this routine will be a high-leverage way to support Black, Latine, and/or Indigenous students in your program?

Improvement science is all about testing small changes that can make a big difference. When time and resources are limited, programs must make tough decisions about where to focus their improvement energy, so it is important to reflect on the rationale for trying out a new practice.

PROGRAM PERSPECTIVE: "We thought asking our experts to speak in depth about their personal and professional journey would help demystify STEM careers and career paths, which includes self-doubt, various forms of support/mentorship, and years of exploration. For racially/ethnically minoritized students, we hoped that hearing these stories and perspectives from experts of Color and diverse identities would help them imagine themselves in that field, and clarify the types of study they could engage in themselves, in the future." - Ellen, Nyjah, Stephen and Jen from Pittsburgh Parks Conservancy Young Naturalists

The Routine

This routine includes three steps, any of which could be implemented on their own. However, STEM PUSH programs have found it powerful to combine elements of all three.

Step 1. Facilitate an activity to gather student input on the types of STEM knowledge, experience, and topics they want to learn more about from a guest speaker.

Most STEM PUSH programs who tried this in an improvement cycle sought to better understand their students' guest speaker interests and priorities by developing brief surveys. To get started constructing your own interest survey, you might use the tools below.

→ Example surveys from RockEDU and Joaquin Bustoz Math-Science Honors Program
→ Use this set of synthesized questions as a jumping off point for creating your own interest survey.

IDEAS AND INNOVATIONS: Think flexibly and creatively about the format in which you might explore your students' perspectives on guest speakers. While a survey may be the most efficient approach for your context, versions of survey questions could also be incorporated into a group discussion or activity that involves voting, a gallery walk, sticky notes, a game, etc.

- Cindy and Ciera from Joaquin Bustoz Math-Science Honors Program first conducted a focus group with a subset of students about what they would like to hear about or learn from a guest speaker. They subsequently used *those* responses to shape the options they offered on the survey administered to a larger group of students.
- Barbara and Greiny from Bridge to Enter Advanced Mathematics (BEAM) facilitated a career exploration session during which students played a career-oriented "would you rather" game and worked in groups to select interview questions for guest speakers. They then completed individual surveys about their interests.

PROGRAM PERSPECTIVE: "The pre-survey enabled us to utilize students' voices when engaging them with people who work in STEM; it helped us to target guest speakers based on an understanding of what career paths students are interested in or want to learn more about…The program facilitators found the survey data interesting and used it to prompt further discussions in class." - Odaelys from RockEDU Lab JUMPSTART

RESPONDING TO SURPRISING DATA: Mary and Janille at Arthur Ashe Institute of Urban Health Health Science Academy did not expect the results they found from analyzing their student interest and speaker evaluation data. While the survey shed light on students' topical interests within the health sciences (e.g., telehealth, veterinary medicine, and public health) that could inform guest speaker recruitment, it also revealed low proportions of students indicating that recent guest speakers inspired them (38%), had expertise connected to students' strengths (12%), or that students identified with the speakers (6%).

Mary and Janille reflected, "Many students have felt a disconnectedness from the guest speakers that we bring in and are unable to identify specific speakers they could identify with. We need to understand more about why students feel disconnected, how they relate to outside speakers, and how to help them improve their connections to speakers (and do similar work with the speakers and facilitators)."

In response, the program planned to conduct focus groups with students and alumni to better understand what creates connectedness with speakers, revise the evaluation forms given to students and speakers to include connectedness questions, and update the guidance given to speakers to better encourage these connections.

Step 2. Create a guide that communicates guest speaker goals and highlights key points for guest speakers to address.

This idea was originally inspired by the "What's My Path" resource developed by the Arthur Ashe Institute of Urban Health/Health Science Academy. Improvers theorized that providing a thoughtful guide to guest speakers would increase the likelihood that the speakers would communicate practical knowledge about STEM college and career possibilities while building affirming STEM identities and sense of belonging for Black, Latina/o/e, and/or Indigenous students. Specifically, Arthur Ashe program leads hoped to encourage guest speakers to address topics such as non-linear and non-traditional STEM pathways, how their backgrounds and strengths connect to STEM, and support systems they drew upon along the way.

A template emerged consisting of three main parts:

- Programs realized the guide was a natural place to include **an overview of their program**, highlighting the program's goals and the specific populations it serves.
- Programs identified **the major categories they hoped the guest speaker would address** (e.g., career trajectory/pathway, current job/focus), and **what they hope students get out of each category** (goals).
- Programs added **guiding questions for each category** that encourage speakers to tell their stories rather than summarize their resume. Questions prompt speakers to share aspects of their journey that normalize doubt and struggle, call out barriers as well as resources for overcoming them, and highlight how their identities intersect with STEM.

Example Guest Speaker Guide

About the TEENS Program:

The Nature Museum TEENS (Teenagers Exploring and Explaining Nature and Science) Program is a stipend-based program that engages Chicago high school students in museum and field-based activities focused on urban ecology and environmental science.

Quick facts about program:

- 10 week program that meets Wednesday and Saturday
- 16 teens in the spring program
- Freshman - Seniors in high school (primarily public, neighborhood schools)
- Come from various parts of city (14 community areas, 13 wards, 13 zip codes; 12 schools)
- 95-100% are from racially/ethnically minoritized groups
- Current academic standing (e.g., GPA, AP classes, letters of recommendation) not a factor for program eligibility or part of the application
- Range of motivations for participating in program

Career Pathway(s) and Identity	Guiding Questions
We'd like for a portion of your presentation to focus on your pathway from high school to where you are now. A majority of our teens are from groups underrepresented in STEM and some would be first generation college students. Our goals for having you speak to this aspect of your experience are: • Act as a role model for various pathways into STEM • Share personal experiences that relate to the lived experiences of the teens in the program (both as high school students and in the future) NOTES:	How did you realize your interests? Did you encounter obstacles or barriers? How did you overcome them? Advice you wish you heard in high school? Before pursuing your selected career path, did you ever doubt your decision? What resources did you use? Where did you look for help/guidance? Who were your role models? Were there any experiences that were particularly significant along your pathway? Were there any experiences that didn't seem that important at the time, but now you look back on it and recognize it as impactful? How would you characterize familial, community, and societal influences on your pathway, both good and bad? How does your field affect your identity and perception of yourself and vice versa? Would you describe your pathway as "straight" (e.g., you always knew you wanted to be an xx), or did your interests change over time?

Your Focus (what you do now)	Guiding Questions
We'd like a portion of your presentation to cover what you do now at your current job and field. Our goals for this section are: • Teens gain a better understanding of your career (what a xx "does") • Teens gain a better understanding of the impact/relevance of your work • Teens explore, share, and identify interests (career wise, general) NOTES:	What does your day-to-day look like? What is your favorite thing about your job? Least favorite? If you could change one thing about your field, what would that be and why? What are the types of skills, dispositions, and other characteristics that are valuable for someone in your position? What are some ways you continue learning? (e.g., conferences, partnerships, professional development) What are other related fields/careers (e.g., some of the different careers that a wildlife biologist can have? academic , gov't, contract, industry, non profit, museum) How can teens continue to explore an interest in this area?
Student Engagement/Activity	**Guiding Questions/Suggested Formats**
We'd like a portion of your visit to engage students in an activity related to your field that also connects with what teens are doing in the program. Our goals for this section are: • Help teens identify that the work they're doing in the program is real science • Teens are able to see that the work they're doing connects to projects outside of our program • Reinforce/support a sense of STEM identity, agency, and belonging • Capitalize on your expertise in the field NOTES:	Examples (depends on speaker's expertise): • Recording birds • Habitat restoration • Identifying collected insects • Making herbal salves • Using air quality monitoring devices • Analyzing open-source data

In addition to yielding more targeted guest speaker content, program leaders found the guide useful for guest speaker recruitment and for scaffolding preparatory conversations with program staff. The process of creating a speaker guide also helped program leaders clarify their goals for bringing in guest speakers in the first place.

Examples of full guest speaker guides can be found here.

ADAPTATION ALERT: After their first round of testing, most programs refined the language and questions in their guide. Several noted that in the future, it would be important to communicate that guest speakers should not feel obligated to answer ALL questions contained in the guide.

IDEAS AND INNOVATIONS:

- For Dave and Aby from Teenagers Exploring and Explaining Nature and Science (TEENS), this improvement cycle created an opportunity for their program to step back and reflect on the purpose and value of guest speakers. Check out the simple document they created PRIOR to developing their guest speaker guide to help them articulate their goals and criteria for having a guest speaker as they relate to the broader program goals.

- Chetta from Project Exploration made a point of engaging guest speakers, when possible, in a "warm handoff" conversation in between the recruitment and presentation stages:

"In the initial stage of our research, we identified the importance of warm handoffs in ensuring that STEM professionals feel at ease and confident. Engaging them in conversation is an effective way to help them feel comfortable, and we prioritized this approach whenever possible. However, the most crucial aspect was connecting them with someone who has a good understanding of Project Exploration's mission and pedagogy. We designed the initial meeting or interview to identify common values and establish synergies. Typically, STEM professionals shared personal and professional experiences to help us uncover crucial story elements. Since conversations could bring up deep-seated trauma or sensitive topics, it was crucial to establish a connection and rapport immediately, which was facilitated by warm handoffs."

How will you know?

Some STEM PUSH improvers measured the effectiveness of their new approach to guest speaker guidance with observation tools that could be used by staff members during guest speaker presentations. This helped them answer questions like *"Will guest speakers cover the topics/themes identified in the guide?" and "Will students engage with the event informed by our new guest speaker preparation process?"*

Observation tools

Programs that tested a guest speaker guide and wanted to know if it was helpful for the guest speaker sent a quick follow up survey through GoogleForms.

Step 3. Plan for intentional reflection on guest speaker experiences.

Reflection is a powerful practice that can reinforce individual and collective learning. Giving students an opportunity to reflect on guest speakers can enhance the "stickiness" of those experiences. Program leaders facilitated student reflection in various ways, including whole group debrief discussions and exit surveys. These tools were aligned with their goals for embedding STEM pathway support into the program.

→ Check out these example post-surveys from RockEDU and Joaquin Bustoz Math-Science Honors Program
→Use our synthesized reflection questions and exit survey as a template for creating your own post-speaker reflection tool.

How will you know?

Student reflection data can also act as a means for program leaders to evaluate the short and long-term success of these events. In the context of their improvement cycles, reflection tools also helped program leaders determine whether or not the changes they made to their guest speaker process were successful, answering questions such as:

- Will the speaker's journey resonate with students' identities in affirming ways?
- Will minoritized students connect aspects of their own lives to guest speakers' journeys?
- Did the guest speaker experience deepen or strengthen students' STEM identity? Did minoritized students see expanded possibilities for themselves within STEM?
- Did students connect their own strengths and assets to competencies that matter in STEM?
- Did the guest speaker experience expand or deepen students' understanding of the diversity and flexibility of STEM trajectories and possible college/career paths?
- Did minoritized students express interest in a field/profession/career that they had not considered before?
- Did the guest speaker experience make students feel more confident in pursuing STEM undergraduate study and/or careers?

IDEAS AND INNOVATIONS: At the end of each day in the Young Naturalists program, students complete a "Gots & Needs" reflection as a group so program staff can understand what they "got" from the day and what they "need" in the future. On guest speaker days, program staff included a speaker reflection component in the Gots & Needs protocol so they could hear student feedback on the speaker themselves, taking notes on students' contributions. See how these improvers organized their observation and student reflection data into a Speaker Data Tracker so they could understand the impact of changes they made to their guest speaker approach.

PROGRAM TAKEAWAYS

- "The speaker guide provided support for speakers so that they can more appropriately prepare for our students. The post-survey also gave us valuable data to understand what the students' takeaways are after these sessions. Overall, students found all guest speaker sessions valuable and over 90% made connections, are more interested in pursuing a STEM major/career, and taught them something new about a STEM major/career." - Odaelys, RockEDU LAB JUMPSTART

- "While the program has regularly had guest speakers in the past, our goals and criteria for having guest speakers were never formally documented...being able to develop and articulate our goals for having speakers, our criteria for having speakers, and a structured guide of what we're hoping our speakers will cover, we could actually study the impact of our interventions...As a result of implementing these tools we saw our teens more engaged...Having the speaker focus on identity and pathway from high school really resonated with a number of teens. Teens that do not frequently share with the whole group were more eager to share and respond to speaker prompts. In their reflections, many of the teens mentioned the non-linear pathway and that it's okay not to know exactly what you want to do." - Dave and Aby, Nature Museum TEENS

- "The Speaker Guide is really helpful and we will continue using it in future years. When we introduce the guide in the future, we should clarify what stories and experiences we hope the speakers share with students. Despite the guide, most speakers still focused on resume-type information and their successes, rather than key learning moments and personal stories...Tell your speakers clearly what you're hoping students will walk away with after they speak. Resume stuff is cool, but not nearly as valuable as personal experiences and stories!" -Ellen, Nyjah, Stephen and Jen from Pittsburgh Parks Conservancy Young Naturalists

RockEDU Student Pre-Survey for Guest Speaker Interest

It is recommended to put these prompts into a form (e.g., Google form).

Please complete this form to give us insight on the type of speakers/careers you'll like to hear from/of.

First name:
Last name:

Race/Ethnicity
Black or African-American
East Asian
Hispanic or Latino/a/x
Jewish
Middle Eastern or Northern African
American Indian or Alaska Native
Native Hawaiian or Pacific Islander
South Asian
Southeast Asian
White
Prefer not to say
Prefer to self-describe
If you prefer to self-describe, do so here:

Gender:
Male/Man
TransMale/TransMan
Female/Woman
TransFemale/TransWoman
Genderqueer/Gender non-conforming
Non-binary
Prefer not to identify

Grade level:
11/12

What is your familiarity with STEM majors and career options?
Scale of 1-5 (1 = I only know a few STEM majors or career options; 5 = I know a lot about STEM majors and career options)

As of today, how interested are you in pursuing a STEM major or career?
Scale of 1-5 (1 = Not at all interested; 5 = Very interested)

What are your areas of interest in STEM? Check all that apply.
Astronomy
Biology
Chemistry
Computer Science
Engineering
Earth sciences
Health sciences
Information technology
Mathematics
Physics
Other
If you mark "Other" please describe your area(s) of interest in STEM.

Do you personally know someone that is a STEM professional (outside of LAB Jumpstart)?
Yes/No
If yes, what area of STEM are they in?

We value and embrace diversity, and wish to connect your identity/ies to STEM careers. For you to be excited to hear from a STEM professional who shares one or more of your identities, what would those identities be?

Arizona State University Joaquin Bustoz Student Input Survey

The JBMSHP will present a career panel on Tuesday, April 5 from 4:00 - 5:30pm at the MU Union Stage. Dinner will be provided. We will also raffle off a $25 Door Dash gift card for those who attend! You can also attend the event via Zoom.

Please provide your input on what kind of guest speaker we should invite to the panel and topics you would like to hear about. This feedback will help us to identify JBMSHP alumni working in industry to speak.

Student information

First Name:
Last Name:
ASU ID:

Major:
Current year:
Gender:
Ethnicity:

Speaker Topics

What topics would you like to hear from a career panel? Choose as many as you like.

- Graduate school - How to pay for it (fellowships, grants, etc.)
- Graduate school - Is it worth it? How does it help with current job?
- Internships - Did they help you with your current job? How did you get it?
- Struggles in college - Was college hard for you (academics, finances, personal)?
- Underrepresented in STEM - Did you face any hardships in your major/ career?
- First-generation student - Do you experience imposter syndrome?
- First-generation student - Did you feel like you could talk to your family about struggles you were facing in college/ work?
- Working in industry - How did you negotiate your salary?
- Working in industry - How did you choose the best company for you?
- Working in industry - When do you know it is time to find another job?

Are there any other topics you would like to hear about?

Majors

What majors would you like to hear from?

- Aerospace/ Mechanical Engineering
- Computer Systems Engineering/ Computer Science/ Electrical Engineering
- Chemical/ Materials Science Engineering/ Sustainability
- Construction/ Civil Engineering
- Bioengineering
- Industrial Engineering
- Mathematics

Are there any other majors you would like to hear from?

Additional comments/ suggestions:

Student Interest Survey Template

Please provide your input on what kind of guest speaker(s) we should invite to [PROGRAM] and/or topics you would like to hear about. This feedback will help us to identify people who match your interests and can best answer your questions.

Name [if ok to be identifiable]

Grade level: [multiple choice appropriate to program]

Gender: [open-ended or multiple choice appropriate to program]

Race/Ethnicity: [open-ended or multiple choice appropriate to program]

[Other demographic/identity information of interest for your context, e.g. first-generation college student, LGBTQIA+]

What is your familiarity with STEM majors and/or career options? [Note: This could be an item you include again on a post-survey to capture change before and after guest speaker events!]

- I'm not really familiar with any STEM majors or career options
- I know about a few STEM majors or career options
- I know about a lot of STEM majors and career options

What are your areas of interest in STEM (select all that apply)?

- a list of topics relevant to your program's STEM focus OR
- a list of STEM fields/disciplines OR
- a list of STEM majors OR
- a list of topics related to STEM college-going more broadly - Some examples:
  - *How do people decide to study STEM in college?*
  - *What do people find challenging about college, and how do they address these challenges?*
  - *What are sources of support for people from groups underrepresented in STEM who pursue a STEM major/career?*

Pro Tip: If you offer a list of topics, fields, careers, etc., consider using descriptions rather than formal names which may not be familiar to students (e.g., "germs, viruses, and diseases" instead of "epidemiology").

Group Members: _____ *Date:* _____

Career Interview Group Planning

Thank you for helping us plan upcoming career exploration activities! As a group, please read the questions on the back of this sheet.

Guests will answer three of the questions that are on the back of this sheet, in front of the whole class. Which three questions would your group pick, and why?

In the table below, write each question you chose and why your group chose it.

Question	**We chose this question because...**

What questions do you think were missing from the list on the back?

Imagine you talked with guests in small groups rather than as a whole class. Would you choose the same questions or different ones? Why?

How do you think speakers might answer questions differently in front of the class vs in small groups?

Interview Question Options

1. What are the major duties/responsibilities of your job?
2. What character traits/work habits do you or your employer expect an employee to have?
3. What training/education is required for this job?
4. What other jobs/people depend on your job getting done?
5. What are the "normal" hours of your job? If there is overtime, how much/often?
6. What types of demand (physical, mental, emotional) or hazards, if any, are involved in your job?
7. What specific types of tools, equipment, and/or technology do you use on a regular basis?
8. What led you to this job/career? If you have/had a role model or mentor, please tell me about them.
9. What do you like most about your job? The least?
10. What courses in middle/high school would help a student prepare for your job/career?
11. What extracurricular activities, volunteer work, and/or part-time job might help someone prepare for your job?
12. What changes, positive and/or negative, have taken place in your job/career recently or since you started? How much have these changes affected you and/or your career?
13. What do you think your job/career will be like in ten years?
14. What is the employment outlook for this field of work and/or how difficult is it to find your type of job?
15. What other occupations are related to your job/career?
16. What advice would you give a student who is considering your type of job/career?
17. What is a typical week at your job/career like?
18. What's a work accomplishment that you're really proud of?
19. Based on what you know now, would you pick the same career path? Why or why not?
20. How did you find your job? Did you have any idea in college that your current job existed?
21. Does your job change often? And if so, how do you update your knowledge and skills?
22. What were your favorite classes in school? How do those classes relate to your current job?
23. What's the best career decision you've ever made? What's the worst?

NOTE: Questions selected from the following resources:

- Tips for Career Day Speakers
- Career Day: Suggested List of Question To Ask Guest Speakers

Name: _____ *Date*: _____

Student Survey

Rank the following career interests from 1 (for "most favorite") to 6 (for "least favorite").

Rank (1-6)	Career Interest
	Working with people
	Creative skills and expression
	Technical and scientific skills
	Manual and mechanical skills
	Leading, persuading, and directing others
	Routines and adhering to standards of performance

Rank the following career activities from 1 (for "most favorite") to 6 (for "least favorite").

Rank (1-6)	Career Activity
	Artistic, unusual, and creative activities
	Working on practical, productive, and concrete activities
	Taking responsibility, providing leadership, and convincing others
	Things being organized into routines and having an order
	Learning by reading, study, analysis, or investigation
	Helping others and being concerned for the welfare of others

What would you like guest speakers to know about you and your classmates before they visit?

What's one thing you can do this year to help you on your career journey? How will it be helpful?

What would you like to do or talk about with guest speakers when they visit?

How strongly do you agree with each of the following statements? Select the best response.

Statement	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Something I like about math is that it is useful.					
Something I like about math is that it is precise.					
Something I like about math is that it is beautiful.					
Something I like about math is that it is challenging.					
Something I like about math is that it can be used to improve the world.					
Something I like about math is that it will help me get a better career.					
I plan to use math in my future career.					
I like to solve complex problems.					
If I am trying to solve a problem, I think of alternate ways to solve it.					
When I don't understand a problem, I keep working until I find the answer.					

Statement	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
If I can't solve a math problem quickly, I quit trying.					
Solving challenging problems helps me improve at doing mathematics.					
I can understand even very complicated ideas in math if I work at it.					
Even if I try hard, how well I learn is something that I cannot change very much.					
I can become a better problem solver by trying hard.					
People who look like me and/or share a similar background work in STEM.					
I have had at least one role model (a peer or adult) who motivated me to do well in math.					

Nature Museum TEENS Guest Speakers: Goals and Criteria

Program goals (short-term outcomes)
Teens will be able to:

- develop transferable science, technology, and 21st century skills
- develop science identity/agency through participation in community and citizen science projects and existing CAS/PNNM projects
- identify a range of college and career paths in environmental sciences and conservation
- collaboratively develop and carry out interest-driven, field-based investigations of the urban environment

Goals for having guest speaker

- Role models for various pathways into STEM
- Share personal experiences that are impactful for teens
- Help students explore, share and identify interests (career wise, general)
- Share content knowledge (expertise) on a variety of topics
- Represent a variety of experiences and demographics (across guest speakers)
- Connects with the work that the teens are doing in the program

Criteria for guest speakers (what we're looking for)

- Speaker represents an underrepresented demographic in the STEM field
- Speakers that can relate to the lived experiences of the teens in the program
- Speakers should represent various career stages
- Experience/comfort speaking to diverse audiences
- Experience/comfort speaking to non-academic audiences
- Speaker's work/focus is local
- Speakers should represent a variety of STEM backgrounds (intersection of other disciplines okay)
- Connects with what teens are doing in the program (ideally directly, but indirect okay too -> related to nature and the environment and people and cities)
- Whenever possible align with teen interests

Guest Speaker Guide Feedback GoogleForm

Thank you again for taking the time to speak with our students. We would love your feedback as we continue to improve how we engage with guest speakers!

1. Did you utilize the guest speaker guide when preparing for the presentation?
[Yes/No/I did not receive a guide]

[If Yes] How helpful was the speaker guide in preparing your presentation?
[scale 1 – not helpful, 5 – very helpful]

2. In retrospect, was there anything you wish had been included in the guest speaker guide that would have helped you feel more prepared to engage with our students?

3. Based on your experience, did you feel that your presentation was at an appropriate level for this group of students? [Yes/No/Unsure]

4. What did you enjoy most about your experience?

5. What could we do better when inviting and hosting guest speakers?

RockEDU Speaker Session Exit Survey

Please complete this short survey at the end of the speaker session.

How likely would you recommend this speaker to a friend or family member?
Scale of 1-5: 1 = Not at all likely; 5 = Extremely likely

The speaker was engaging and gave me an opportunity to discuss with my classmates, ask questions, and share my thoughts.
Strongly disagree, Disagree, Neutral, Agree, Strongly agree

What was something new that you learned from the presentation today? What is something you're still confused about?

I was able to make connections with the speaker – through their work, life experiences, or interests.
Strongly disagree, Disagree, Neutral, Agree, Strongly agree

The speaker made me more interested in pursuing a STEM major/career.
Strongly disagree, Disagree, Neutral, Agree, Strongly agree

The speaker taught me something new about a STEM major/career.
Strongly disagree, Disagree, Neutral, Agree, Strongly agree

What did the speaker do well?

What could the speaker do better?

ASU Joaquin Bustoz Guest Speaker Event Post Survey

Thank you for attending today's JBMSHP career panel. We hope that you found it informative and helpful!

Please complete this short feedback survey by 10am on Wednesday, April 6, 2022, to be entered in a raffle to win one of TWO $25 Door Dash gift cards! Winners will be notified by email tomorrow.

Thanks again for attending!

Student information

First Name:

Last Name:

ASU ID:

Major:

Current year:

Gender:

Ethnicity:

Student feedback questions

• I feel like the speakers helped to ease any anxieties I may have about a STEM career after graduation.

• I feel like I gained a better insight on what to expect for grad school.

• I feel like I could relate to the speakers - we seem to have similar life experiences/ backgrounds/ challenges.

• Which STEM professional did you enjoy hearing from and why?

• What did you like most about this career panel?

• Is there anything you would change about this career panel event?

• Would you be interested in attending a speaker series in the future with JBMSHP alumni in industry?

• Please share any additional comments, thoughts, and suggestions for future events.

Reflection Questions

In a same or next-day debrief, give students time to jot down responses to one or more of the questions below. Once they have had time to reflect, facilitate a group share-out in which each student shares one response.

- What is something that stuck with you from the guest speaker? For example, was there something new you learned, want to explore, or are curious about?
- Was there anything that surprised you about this guest speaker's journey? (If so, what?)
- Were you able to relate to this guest speaker? If so, how? For example, did anything the speaker shared provide a new perspective on yourself, your interests, your skills, and/or your place in science?
- How do the knowledge and/or skills you have connect to the knowledge and skills the guest speaker uses in their job?
- Does this guest speaker's career connect at all to other parts of your life and things that matter to you? If so, how?
- What is something you're still confused about, or have more questions about?

Student Exit Survey

I felt like I could relate to the speaker(s) – through their background, their life experiences, their work, and/or their interests. [Yes/No]
  - [If yes] What about the speaker did you connect with?

I learned something new about a STEM major/career.
[Strongly disagree, Disagree, Agree, Strongly agree]
  - [If agree or strongly agree] What did you learn from the speaker(s) that you didn't know before?

The guest speaker(s) made me feel like there is a community for me in STEM.
[Strongly disagree, Disagree, Agree, Strongly agree]

The speaker helped me feel more confident about pursuing a STEM career after high school.
[Strongly disagree, Disagree, Agree, Strongly agree]

I feel like I gained a better understanding of what to expect if I major in STEM.
[Strongly disagree, Disagree, Agree, Strongly agree]

This speaker made me more interested in pursuing a STEM major/career.
[Strongly disagree, Disagree, Agree, Strongly agree]
  - [If agree or strongly agree] What about this guest speaker made you more interested pursuing a STEM major/career?

How do the knowledge and/or skills you have connect to the knowledge and skills the guest speaker uses in their job? [open-ended and "I don't know/I'm not sure" option].

- [If "I don't know/I'm not sure]":
  - I answered "I don't know/I'm not sure" because I'm not sure what knowledge and skills this STEM professional uses
  - I answered "I don't know/I'm not sure" because I couldn't think of the knowledge or skills I have
  - I answered "I don't know/"I'm not sure" because I don't see a connection between my knowledge/skills and what this STEM professional does

The speaker was engaging (for example, gave me an opportunity to discuss with my peers, ask questions, and/or share my thoughts).
[Strongly disagree, Disagree, Agree, Strongly agree]

Please share anything else you'd like us to know about what you liked or didn't like about this guest speaker experience.

End of speaker series or end-of-program survey

This survey can help you determine the longer-term impact or stickiness of guest speaker experiences. This could be a quick standalone survey or integrated into an existing end-of-program survey or feedback form.

[If you asked this earlier in the program and/or on a guest speaker student input survey]
What is your familiarity with STEM majors and/or career options?

- I'm not really familiar with any STEM majors or career options
- I know about a few STEM majors or career options
- I know about a lot of STEM majors and career options

OR

Which best describes your knowledge about [STEM majors/STEM career options/specific STEM field(s)] after hearing from the guest speakers who came this [summer/semester/year, etc]?
[check all that apply]

- I know more about [STEM majors/STEM careers/specific STEM field(s)] now than I did before hearing from the guest speakers.
- I know about the same about [STEM majors/STEM careers/specific STEM field(s)] NOW as I did before hearing from the guest speakers.
- I have more QUESTIONS about [STEM majors/STEM careers/specific STEM field(s)] now than I did before hearing from the guest speakers.

Which STEM professional did you enjoy hearing from the MOST and why? [Provide a list of guest speakers that includes their field/profession].

Is there anything you would change about this [career panel event/guest speaker series]?

Please share any additional comments, thoughts, or suggestions for future guest speaker events.

Observation Tools

Once one or more of these tools has been completed for multiple speaker events, you can compare data across different speakers to better understand which speakers, topics discussed, and/or activities most engaged your students.

Speaker Checklist (Young Naturalists)

This checklist can be completed by a program staff observer during the guest speaker event.

The checklist is aligned with program-created guest speaker guides which focus on encouraging speakers to discuss the intersection of their career, experiences, and identities. Modify this form to address the goals and structure of your program's own guest speaker guide!

Career Pathways and Identity. Check all that apply.

Did the Speaker:

- ☐ discuss their pathway from high school to their current role?
- ☐ have a linear career pathway (i.e., high school to college to current position) or an indirect pathway?
- ☐ discuss obstacles or barriers on their career path?
- ☐ discuss resources, help, or role models that assisted them on their career path?
- ☐ share advice they wish they'd heard when they were in high school?
- ☐ talk about family, community or societal influences?
- ☐ share aspects of their identity (such as race/class/gender/sexuality/ability) in relationship to their field? List which aspects of their identity they discussed:

Current Career Focus. Check all that apply.

Did the Speaker:

- ☐ describe what they do now in their current role?
- ☐ discuss their favorite or least favorite thing about the job?
- ☐ talk about skills or dispositions important in their field of work?
- ☐ describe accomplishments they are proud of?
- ☐ discuss related fields?
- ☐ talk about ways for students to continue exploring this career field?

Did the **Students**:

- ☐ actively listen to the speaker?
- ☐ ask questions or share comments about the speaker's career path?
- ☐ ask questions or share comments related to the speaker's identity?
- ☐ ask questions or share comments about the speaker's current field or work?

Nature Museum TEENS Speaker Workshop Observation Tool

Speaker workshop content
Completed by one staff member during workshop and discussed with staff immediately following; each section refers to section in template and staff member will have template alongside this document).

"Career Pathway(s) and Identity" section
Did the speaker describe their pathway from high school to their current role? (circle one)

In depth description that covers multiple prompts from the template	Pathway briefly covered, but not in depth and little reference to identity	Pathway not covered
Notes:		

"Your Focus (what you do now)" section
Did the speaker describe what they do now in their current role as well as related fields? (circle one)

In depth description that covers multiple prompts from the template	Brief description of what speaker does now that only covers one or two of the prompts	Current focus not covered
Notes:		

"Student Engagement/activity" section
Did the speaker engage teens in activity or investigation that connects the teen work in the program to what the speaker does in their current role? (circle one)

Speaker engages teens in an activity that connects to program focus	Speaker engages teens in an activity, but not directly connected to program topics	Speaker does not engage teens in an activity or investigation
Notes:		

General Reflections:

Speaker-teen interaction
Completed by at least one staff member during presentation; discussed by all staff following presentation. Where box is checked, briefly describe.

"Look fors"

- ☐ Teens ask presenter questions and/or share connections
- ☐ Teens ask presenter questions related to pathway
- ☐ Teens ask presenter questions related to current job
- ☐ Teens ask presenter questions related to how presenter's identities impact(ed) pathway and current role
- ☐ Teens share connection to content or experience shared by presenter
- ☐ Teens are "engaged" in the presentation (not on phones or engaged inside conversations, focused on speaker, etc.)
- ☐ Presenter responses to teen questions and/or ideas are affirming and positive
- ☐ Presenter responses are age appropriate

Record types of interactions (ex. Mostly responses, but also some questions.
Record number of teens interacting (i.e., is it only one or two teens asking questions, or a majority?)

Student and Speaker Reflection Questions

Student Engagement Tool

These forms provide numerical values for student engagement with the speaker, and allow staff to reflect on what drives student engagement during speaker events, and for whom.

This form can be completed by a program staff observer during and immediately after the guest speaker event. (If someone is also completing the speaker checklist, it is preferable to have a different person complete this form - if possible - so observers do not have to attend to multiple tools at once!).

PART 1. COMPLETE **DURING** SPEAKER EVENT				
Number of student attendees:				
Student Name	Racial/ethnic identity (if known)	Other identities of interest (if known)	Participation *(Mark a tally each time this person engages in the discussion)*	What topic(s) or activity garnered this student's engagement?

PART II. COMPLETE **AFTER** SPEAKER EVENT	
How many students attended the event?	
What percentage of students contributed at least once to the discussion?	
What percentage of students contributed 3 or more times to the discussion?	
Did you notice any patterns of participation in terms of age, racial/ethnic identities, and/or other identities?	

Share with Us

We would love to hear from you.

Tell us how this improvement package is supporting your work at www.stempushnetwork.org/contact-us/

Share on social.

Stay in the loop with our newsletter, and follow us on social media.