Bridging Gaps with Science Outreach – Minne, et al.

Appendix A. Supplementary Materials.

Think Like a Scientist Volunteer Code of Conduct

Mission

The mission of Think Like a Scientist (TLaS) is to invest in early childhood education to empower the next generation of scientists. We fulfill our mission by offering after-school science programs free-of-charge to elementary schools that serve historically underrepresented groups (HUGs) in STEM surrounding the CU Anschutz medical campus. We rely on volunteers to help fulfill this mission. We also strive to make science accessible and fun through hands-on experiments and personal connections with volunteer scientists. Volunteers are expected to uphold this code of conduct when representing TLaS.

Expectations

Volunteers are held to the following expectations:

1. Make science education fun and interesting
2. Be courteous and respectful when speaking with TLaS participants (aka 'young scientists') and when speaking other volunteers and partnering school staff
3. Be encouraging and positive when speaking with TLaS participants (aka 'young scientists') and when speaking with staff and other volunteers
4. Speak and act appropriately, professionally, and ethically while volunteering
5. Attend all sessions you signed up for punctually
6. If a true emergency arises that would prevent you from attending a session, inform the appropriate TLaS contacts as soon as possible
7. If an unforeseen conflict arises that would prevent you from attending a session, inform appropriate TLaS contacts at least 1 week in advance so that an alternate volunteer can be found to take your place as this program relies on the appropriate number of volunteers at each session to provide safe and effective hands-on science programming
8. Contact TLaS leadership when unsure of anything relating to the volunteering sessions

Unacceptable behavior

1. Breaching any confidentiality before, during, and after volunteering sessions (e.g. posting photos of classrooms you volunteered with without receiving consent from teachers; discussing another scientist's/volunteer's personal information or media without their consent)
2. Using curse words or other profanity during volunteer sessions
3. Using sexist, racist, homophobic, or ableist language during volunteer sessions
4. Soliciting any kind of promotion or materials during volunteer sessions
5. Placing personal gain above the interest of the mission of TLaS and the participants

Think Like a Scientist agrees to

1. Be available for questions and feedback
2. Keep volunteers informed about upcoming events, training sessions, and volunteering sessions
3. Treat all volunteers and their concerns with respect
4. Provide volunteers with access to training videos related to the Think Like a Scientist program
5. Provide an agreement to partnering schools and teachers regarding their appropriate conduct with volunteers

By signing below, you agree that you have read and fully understand and will abide by Think Like a Scientist volunteer code of conduct.

_____

Volunteer

Figure A1. Think Like a Scientist Volunteer Code of Conduct.

NAME: _____

Think Like a Scientist SURVEY

Thank you for taking the 'Think Like a Scientist' after-school class! We enjoyed getting to know you and teaching you all about how science works and how scientists think! We are asking you to take this survey so that you can help us make this class better.

For each question, please circle a number as your answer letting us know how you felt **BEFORE** the program compared to how you feel **AFTER** the program.

1. How exciting did you think science was…
note: a '**1**' means 'not very exciting' and a '**5**' means 'kind of exciting' and '**10**' means 'super exciting'

… **before** this program? **1 2 3 4 5 6 7 8 9 10**

… after this program? **1 2 3 4 5 6 7 8 9 10**

2. How much would you say you knew about the scientific method…
note: a '**1**' means 'not much' and a '**5**' means 'some' and '**10**' means 'a lot'

… before this program? **1 2 3 4 5 6 7 8 9 10**

… after this program? **1 2 3 4 5 6 7 8 9 10**

3. How confident are you that you would have been able to make an experiment to test a question that you have…
note: a '**1**' means 'not confident' and a '**5**' means 'kind of confident' and '**10**' means 'very confident'

… before this program? **1 2 3 4 5 6 7 8 9 10**

… after this program? **1 2 3 4 5 6 7 8 9 10**

4. How easily did you see yourself becoming some type of scientist one day...
note: a '**1**' means 'not at all' and a '**5**' means 'maybe' and a '**10**' means 'definitely'

… before this program? **1 2 3 4 5 6 7 8 9 10**

… after this program? **1 2 3 4 5 6 7 8 9 10**

FLIP OVER - more questions on the back!

Figure A2. Think Like a Scientist Student Participant Survey Example.

NAME: _____

These questions are being asked so that you can help us make this class better the next time we teach it. Please write answers to the questions that are **honest** and **constructive** (this means that you will tell us very nicely what you think ☺)

5. On a scale of 1 to 10, how would you rate this class? Circle the number below
note: a '10' means it's totally amazing and a '1' means that it needs to get better

1 2 3 4 5 6 7 8 9 10

6. What did you like most about this class?

7. Is there anything else that you wish you had learned in this class?

8. Is there anything you think we should leave out next time?

9. What can we do to make this class better?

10. Would you recommend that other students at your school take this class?

Circle your answer: YES NO

Why or why not?

T H A N K Y O U ☺ for taking this class and the survey!

Think Like a Scientist (TLaS) Volunteer Experience Survey

Thank you for volunteering with TLaS! Volunteers like you make our community outreach program possible. Please take a few minutes to complete this brief survey to help us to learn more about you, determine how the experience impacted you as a volunteer, and help us to strengthen the program in the future.

Please keep in mind that TLaS offers this program FREE of charge to all schools it partners with because most of the students are of very low socioeconomic status (>80% qualify for free and reduced lunch). Additionally, at most schools, TLaS is the ONLY science that the students are exposed to. Science has been removed or drastically decreased at the schools we visit to focus on meeting state testing standard in reading, writing and math. Your contribution as a volunteer made a valuable impact on the science education of the students TLaS serves.

* Indicates required question

1. What is your CU Anschutz affiliation? *

Mark only one oval.

- ◯ CHA/PA Program
- ◯ Dental School
- ◯ Graduate School
- ◯ Medical School
- ◯ Nursing School
- ◯ Pharmacy School
- ◯ Children's Hospital
- ◯ University Hospital
- ◯ Other: _____

Figure A3. Think Like a Scientist Volunteer Survey Example.

2. What is your current position? *

Mark only one oval.

- ◯ Faculty
- ◯ PRA
- ◯ Master's Student
- ◯ PhD Candidate
- ◯ Post-doctoral Fellow
- ◯ Medical Student
- ◯ CHA/PA Student
- ◯ Dental Student
- ◯ Pharmacy Student
- ◯ Other

3. TLaS offers all programming for free to schools in need, partnering specifically with schools where the majority of students are on free and reduced lunch. Along those lines, TLaS offers this program to schools with diverse student populations (i.e. ethnicity and socioeconomic status). Ideally, we would like to recruit a diverse population of volunteers to show our student participants that everyone can be a scientist. If you agree to share your information, please select all of the options below that accurately describe your demographic information.

Check all that apply.

- ☐ African American / Black
- ☐ Asian
- ☐ Caucasian / White
- ☐ Hispanic / Latino
- ☐ Native American
- ☐ Native Hawaiian / Pacific islander
- ☐ Two or more races
- ☐ First generation college student
- ☐ English as a Second Language Learner (ESL)
- ☐ I prefer not to reveal this information
- ☐ Other: _____

4. Have you volunteered with TLaS before this current experience? *

Mark only one oval.

- ◯ Yes
- ◯ No

5. Please select the following location that you most recently volunteered at that prompted the delivery of this survey

Mark only one oval.

- ◯ Boston Elementary (Aurora, CO)
- ◯ Crawford Elementary School (Aurora, CO)
- ◯ Montview Elementary (Aurora, CO)
- ◯ Central Library (Aurora, CO)
- ◯ Martin Luther King Jr. Library (Aurora, CO)
- ◯ I'm not sure about the location where I volunteered

6. How did you hear about volunteer opportunities with TLaS?

_____

7. *

Mark only one oval per row.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree	NA
TLaS fosters a positive learning environment for participating students	◯	◯	◯	◯	◯	◯
TLaS fosters a positive representation of science for participating students	◯	◯	◯	◯	◯	◯

TLaS exposes students to science through hands-on activities that make science approachable and fun						
The TLaS materials emailed to me prior to my volunteer experience helped me to prepare for the session						
Volunteering with TLaS has contributed to diversifying my professional experience						
Volunteering with TLaS helped me fulfill a portion of my teaching goals						
Volunteering with TLaS helped me fulfill a portion of my community outreach goals						
I contributed to a positive learning environment						
I would volunteer with TLaS again in the future						
I would recommend volunteering with TLaS to my professional peers and colleagues						

8. We welcome any additional feedback about your volunteer experience that could be used to strengthen the program or improve future volunteer experiences. THANK YOU for volunteering with TLaS and for sharing your feedback. We hope to see you back as a volunteer in the future

9. Are you interested in taking on a leadership role in Think Like a Scientist? We are hoping to expand the program into more schools and need more people like you to take on leadership roles to do so. If interested, please type your email address into the box below. Thank you :)

Community Partner Evaluation of TLaS Program

Thank you in advance for providing TLaS with constructive and thoughtful feedback. We appreciate your partnership and hope to collaborate with you for many years to come!

* Indicates required question

1. Email *

2. For which school, library or program are you completing this evaluation for? *

Mark only one oval.

- Boston P-8
- Crawford Elementary
- Montview Elementary
- Paris Elementary
- MLK Jr. Library - Aurora
- Central Library - Aurora
- Hoffman Heights Library - Aurora
- Denver Metro Regional Science and Engineering Fair (DMRSEF)

3. What is your role at your school, library or program? *

TLaS Program Impact Questions

Figure A4. Think Like a Scientist Community Partner Survey Example.

4. *

Check all that apply.

	Strongly Agree	Agree	Neutral	Disagree	Srtongly Disagree
TLaS positively impacted the participating students	☐	☐	☐	☐	☐
TLaS positively impacted the participating program (school, library, other)	☐	☐	☐	☐	☐
TLaS was a fun and positive learning experience for students	☐	☐	☐	☐	☐
My program (school, library, other) plans to continue its partnership with TLaS in the future	☐	☐	☐	☐	☐
I would recommend the TLaS program to my colleagues and other programs	☐	☐	☐	☐	☐

5. Please provide TLaS with any additional comments, suggestions or feedback from yourselves and/or the members of your community (teachers, parents, students, etc.).

6. Please provide TLaS with testimonials from yourselves and/or members of your community (teachers, parents, students, etc.). Anything that would demonstrate the impact of the program would be valuable.

Table A1. *Colorado Measures of Academic Success School, District, and State Proficiency Scores for Partnering Schools.*

Math Proficiency	School Level	District Level	State Level
Crawford	3%	10%	27%
Paris	5%		
Boston*	8%		

Literacy Proficiency	School Level	District Level	State Level
Crawford	12%	20%	41%
Paris	8%		
Boston*	8%		

*All data are based on the 2020 – 2021 and 2021 – 2022 school years. *Boston is a P-8 school.*

Table A2. *Wilcoxon Analysis of TLaS Student Participant Post-Pre Surveys.*

Question	Input	Group1	Group2	Effect size	n1	n2	Magnitude
Confidence of experimental design	student_response	before	after	0.753280327	75	75	large
Interest in science-related career	student_response	before	after	0.799330346	75	75	large
Knowledge of scientific method	student_response	before	after	0.795478552	74	74	large
Passion for science	student_response	before	after	0.745106037	75	75	large