

APPENDIX A

SCIENCE TEACHERS AS PUBLIC HEALTH EDUCATORS QUESTIONNAIRE

- 1) Do you teach **multiple subjects to a single class of students** all/most of the day?
 - Yes (typical of elementary teachers who teach in a self-contained classroom)
 - No (typical of teachers who teach in departmentalized or teaming situations)

- 2) **During the 2021-22 school year**, have you addressed COVID in any of your science instruction (for example: class discussion, formal lesson, student presentation, current event coverage)?
 - Yes
 - No

- 3) How does your teaching about COVID this school year (2021-22) compare to your teaching about COVID last school year (2020-21)?
 - I've spent **much less time addressing COVID this school year** than I did last school year.
 - I've spent **slightly less time addressing COVID this school year** than I did last school year.
 - I've spent **about the same amount of time addressing COVID this school year** as I did last school year.
 - I've spent **slightly more time addressing COVID this school year** than I did last school year.
 - I've spent **much more time addressing COVID this school year** than I did last school year.

- 4) K-12 science teachers tend to be responsible for instructional activities and non-instructional tasks. About how many hours did you spend in a typical week on:
 If you began teaching during the pandemic, please select N/A in the "Prior to Pandemic" column.
[Response options: N/A, <10 hours, 11-20, 21-30, 31-40, 40-50, 51-60, >60 hours]

	Prior to the pandemic	Last school year (2020-21)	This school year (2021-22)
a. Science instructional activities (for example: preparing science lessons, teaching science lessons, <u>managing materials</u> , and <u>grading</u>)			
b. Non-instructional tasks (for example: writing/answering emails, troubleshooting technology, talking with students/parents/other teachers)			

- 5) **During the 2021-22 school year**, have you used COVID to address topics that are part of your science curriculum?
 - Yes
 - No

- 6) **During the 2021-22 school year**, have you addressed COVID as a stand-alone topic, unrelated to the rest of your science curriculum (for example: a current event topic outside of the specified curriculum of your classes)?
- Yes
 - No
- 7) **During the 2021-22 school year**, which of the following topics have you covered? *Select all that apply.*
- What COVID is (for example: the difference between the virus and the disease)
Symptoms of COVID
 - How COVID is diagnosed
 - Types and accuracy of COVID tests (for example: antigen/rapid, PCR)
 - How COVID tests work
 - How COVID is treated
 - Common misconceptions about COVID
 - How coronavirus is transmitted among humans
 - Ways to prevent coronavirus transmission (for example: masking, hand washing)
 - Factors that place people at risk for contracting coronavirus (for example: age, immunocompromised)
 - Local/national COVID policies and procedures (for example: mask mandates, quarantining, contact tracing)
 - Access to COVID vaccines (nationally and/or globally)
 - Types of COVID vaccines (mRNA, viral vector) and how they work
 - The process/timeline for developing COVID vaccines
 - Side effects of COVID vaccines
 - Efficacy of COVID vaccines
 - Safety of COVID vaccines
 - COVID vaccine hesitancy
 - COVID immunity
 - How the virus has changed/mutated over time
 - Differences among strains of COVID (for example: Delta, Omicron)
 - Differences between outbreaks, epidemics, pandemics, and endemics
 - How COVID compares to other pandemics (for example: influenza 1918)
 - Social disparities in COVID transmission/treatment/impacts
 - Environmental impacts of COVID supplies (for example: masks, gloves, testing kits)
 - Broader impacts of COVID (for example: impacts on the economy, education, etc.)
 - How to evaluate sources of information about COVID

8) **During the 2021-22 school year**, which of the following have you used in your COVID instruction? *Select all that apply.*

- Commercially published materials (printed or electronic)
- Commercially published kits/modules (printed or electronic)
- State, county, or district-developed units or lessons
- Lessons or resources from websites that have a subscription fee or per lesson cost (for example: BrainPop, ShareMyLesson, Teachers Pay Teachers)
- Lessons or resources from websites that are free (for example: Khan Academy)
- Units or lessons you created (either by yourself or with others)
- Units or lessons you collected from any other source (for example: conferences, journals, colleagues, university, or museum partners)
- None of the above

9) **During the 2021-22 school year**, which of the following sources/materials have you used to teach about COVID? *Select all that apply.*

- [COVID-19! How Can I Protect Myself and Others?](#) from the Smithsonian Science Education Center
- Materials from the [Responding to an Emerging Epidemic through Science Education \(REESE\) project](#)
- [Responding to a Mystery Illness](#) from Amgen Biotech Experience
- [COVID-19 Lesson Plans from NIH](#)
- [Exploring Infectious Diseases](#)
- [National Geographic's Interdisciplinary K-12 Resources](#)
- [CDC's Toolkit for K-12 Schools](#)
- [Discovery Education](#)
- [TedEd](#)
- [Mystery Science](#)
- None of the above

10) **During the 2021-22 school year**, have your students asked questions about COVID?

- Yes
- No

11) Please list up to five (5) questions your students have asked about COVID.

- 1.
- 2.
- 3.
- 4.
- 5.

12) What was the single most important factor that made you decide to address COVID **during the 2021-22 school year**?

13) What was the single most important factor that made you decide **not** to address COVID **during the 2021-22 school year**?

14) **During the 2021-22 school year**, to what extent has each of the following been a **source of information** for you about COVID, *whether for instruction or for your personal use? Select one on each row.*

	Not at All	Minimal	Moderate	To a Great Extent
a. Local news station (for example: NBC4), via radio, TV, or internet	()	()	()	()
b. National broadcast TV news program (for example: NBC Nightly News, CBS Nightly News)	()	()	()	()
c. 24 hour TV news (for example: CNN, MSNBC, FOX, BBC)	()	()	()	()
d. TV talk show (for example: the View, Today Show, Daily Show)	()	()	()	()
e. Radio/internet/podcast program (for example: NPR, TedTalk)	()	()	()	()
f. Online-only sources (for example: Huffington Post, Yahoo News, AOL)	()	()	()	()
g. Newspapers, whether print or online (for example: NY Times, Boston Globe)	()	()	()	()
h. Popular science magazines (for example: Scientific American, Discover)	()	()	()	()
i. Other magazines, whether print or online (for example: Time, New Yorker)	()	()	()	()
j. Centers for Disease Control and Prevention (CDC) website	()	()	()	()
k. Johns Hopkins Coronavirus Resource Center website	()	()	()	()
l. National Institutes of Health (NIH) website	()	()	()	()
m. World Health Organization (WHO) website	()	()	()	()
n. Websites from other health organizations (besides CDC, Johns Hopkins, NIH, and WHO)	()	()	()	()
o. Websites from teacher professional organizations (for example: National Science Teaching Association, National Association of Biology Teachers)	()	()	()	()
p. Social media (for example: Facebook, Instagram, LinkedIn, Twitter)	()	()	()	()
q. Printed publications from federal agencies (for example: the Centers for Disease Control, National Institutes of Health)	()	()	()	()
r. Printed publications from international health organizations (for example: World Health Organization)	()	()	()	()
s. Printed publications from teacher professional organizations (for example: National Science Teaching Association, National Association of	()	()	()	()

Biology Teachers)				
t. Resources provided by your school district	()	()	()	()
u. Conversations with health professionals (for example: nurses, doctors)	()	()	()	()
v. Conversations with other teachers	()	()	()	()
w. Conversations with others (i.e., not health professionals or teachers)	()	()	()	()

15) The COVID pandemic created a number of challenges for science teachers. Please **describe up to three (3) of the biggest challenges related to your science teaching** that you have experienced during the pandemic.

- 1.
- 2.
- 3.

16) Interestingly, some science teachers also experienced a number of unanticipated benefits as a result of the pandemic. If this is true of you, please **describe up to three (3) benefits of the pandemic related to your science teaching** that you have experienced.

- 1.
- 2.
- 3.

17) Please rate the extent to which you disagree/agree with each of the following statements. *Select one on each row.*

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
a. I am confident in my ability to successfully teach about COVID.	()	()	()	()	()	()
b. I could currently find ways to teach about COVID if I wanted to.	()	()	()	()	()	()
c. It is up to me whether or not to teach about COVID.	()	()	()	()	()	()
d. The topic of COVID is well aligned to the content standards I am required to teach.	()	()	()	()	()	()
e. It is expected that I teach about COVID.	()	()	()	()	()	()
f. The decision about whether or not to teach about COVID is beyond my control.	()	()	()	()	()	()
g. It is difficult for me to teach about COVID.	()	()	()	()	()	()
h. I am able to choose when and how to teach about COVID.	()	()	()	()	()	()
i. I feel social pressure to teach about COVID.	()	()	()	()	()	()
j. I have adequate access to	()	()	()	()	()	()

supports/resources/materials for teaching about COVID.						
k. Other people get to decide whether or not I teach about COVID.	()	()	()	()	()	()
l. People who are important to me in my profession (for example: other teachers, principals) have asked if I am teaching or planning to teach about COVID.	()	()	()	()	()	()
m. People who are important to me in my profession (for example: other teachers, principals) think I should teach about COVID.	()	()	()	()	()	()
n. I am confident in my ability to successfully teach about COVID.	()	()	()	()	()	()
o. I could currently find ways to teach about COVID if I wanted to.	()	()	()	()	()	()

18) The following statements represent a range of feelings science teachers may experience. Teachers may have experienced some of these feelings prior to the pandemic. Other feelings may have surfaced last school year (2020-21) or this school year (2021-22). Please indicate which of the following you have personally felt and when. **(Check all that apply in each row. You may have multiple checkmarks in a single row.)**

	Prior to the pandemic	Last school year (2020-21)	This school year (2021-22)	Never
a. nervous, anxious, worried, or on edge about my science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. concerned that my science teaching is not effective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. concerned that I am unprepared or under-prepared to teach science	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. little interest or enjoyment in teaching science	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. confident that I am a good science teacher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. dissatisfied with the quality of my science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. certain that I can adapt my science teaching to any circumstances/situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. enthusiastic about science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. tired/exhausted from the additional effort it takes to teach science during COVID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. confident that my students are learning science	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. confident in my ability to actively engage students during science instruction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. unprepared or under-prepared to support the social emotional needs of my students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

m. disconnected/isolated from students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. disconnected/isolated from colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. frustrated by lack of support from my district for science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. frustrated by lack of support from my school for science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. frustrated by lack of support from my community for science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. frustrated by the lack of resources/materials for science teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. optimistic that my school/district is headed in a positive direction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. unsure how to teach science given the school climate/context	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. overwhelmed by extra work as a result of student absenteeism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. overwhelmed by extra work as a result of covering classes/duties for teachers who are absent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
w. overwhelmed by the amount of time it takes to prepare and deliver science instruction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x. stressed out by problems with technology (for example: lack of internet access, reliable device, issues with log in)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
y. anxious about balancing home and work responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z. scrutinized about my ability to teach real world science and how it impacts student life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19) To what extent have you considered **leaving** the teaching profession: *Select one on each row.*

	Not at All	Minimal	Moderate	To a Great Extent
a. Prior to the pandemic	()	()	()	()
b. Last school year (2020-21)	()	()	()	()
c. This school year (2021-22)	()	()	()	()

20) How likely are you to leave teaching in the next two years (for reasons other than scheduled retirement)?

- Not at all likely
- Somewhat likely
- Very likely
- Extremely likely

21) Please indicate which of the following factors have influenced your interest in leaving the teaching profession. *Select all that apply.*

- A health condition that puts you at greater risk for illness under COVID
- A loved one who you either live with or see regularly who has a high-risk condition under COVID
- Inadequate safety plans for COVID mitigation at your school or district
- Challenges of remote/hybrid instruction

- Challenges of in-person instruction
- Inadequate support from your school or district
- Inadequate support or involvement from parents/guardians
- Student behavior
- Inadequate instructional materials
- Childcare responsibilities
- Interest in transitioning to a different education-related job (for example: school administration, tutoring)
- Interest in transitioning to a job that is not education-related
- Insufficient pay
- Demands of teaching on your time
- The stress of teaching
- Dissatisfaction with the way things are run at your school
- Pressure to teach/not teach certain topics or in certain ways
- Lack of support for science instruction at your school

22) To what extent have each of the following influenced your decision to **stay** in the teaching profession?

	Not at All	Minimal	Moderate	To a Great Extent
a. Passion for teaching/content	()	()	()	()
b. Enjoyment in working with students	()	()	()	()
c. Income/job security	()	()	()	()
d. Amount of time invested and/or being close to retirement	()	()	()	()
e. Optimism that teaching conditions will get better	()	()	()	()

23) [Former teachers only] At what point did you stop teaching?

- At the end of the 2019-2020 school year
- During the 2020-2021 school year
- At the end of the 2020-2021 school year
- During the 2021-2022 school year

24) [Former teachers only] How did you leave your teaching position?

- I took early retirement
- I took scheduled retirement
- I resigned
- I was furloughed
- I was laid off
- I took an unpaid leave of absence

25) [Former teachers only] Did you leave teaching mainly because of reasons related to the COVID pandemic?

- Yes
- No

26) [Former teachers only] Please indicate which of the following factors contributed to your decision to leave the teaching profession. *Select all that apply.*

- A health condition that puts you at greater risk for illness under COVID
- A loved one who you either live with or see regularly who has a high-risk condition under COVID
- Inadequate safety plans for COVID mitigation at your school or district
- Challenges of remote/hybrid instruction
- Challenges of in-person instruction
- Inadequate support from your school or district
- Inadequate support or involvement from parents/guardians
- Student behavior
- Inadequate instructional materials
- Childcare responsibilities
- Interest in transitioning to a different education-related job (for example: school administration, tutoring)
- Interest in transitioning to a job that is not education-related
- Insufficient pay
- Demands of teaching on your time
- The stress of teaching
- Dissatisfaction with the way things are run at your school
- Pressure to teach/not teach certain topics or in certain ways
- Lack of support for science instruction at your school

During the pandemic, some science teachers partnered with school counselors, school social workers, and/or school mental health professionals. These individuals provided support to teachers, students, and families.

27) Did you have access to school counselors, school social workers, or school mental health professionals during the pandemic?

- Yes
- No

28) Did you receive support from school counselors, school social workers, or school mental health professionals during the pandemic?

- Yes
- No

29) To what extent did you receive the following types of supports from school counselors, school social workers, or school mental health professionals during the pandemic? *Select one on each row.*

	Not at All	Minimal	Moderate	To a Great Extent
a. Explained how to refer a student to the school counselor/social worker/mental health professional for additional social emotional services or support	()	()	()	()
b. Checked in with teachers on a regular basis about their own social emotional well-being	()	()	()	()
c. Provided resources for teachers' own mental health	()	()	()	()
d. Provided resources for the mental health of students and their families	()	()	()	()

e. Provided information about how to work with students who are experiencing grief or trauma	()	()	()	()
f. Assisted with classroom management	()	()	()	()
g. Followed up with students who are absent due to COVID (for example: recovering from COVID, quarantining, caring for a family member)	()	()	()	()

30) [Former teachers only] Your responses to the previous questions will give us some information about your experiences during the pandemic, but we would really like to know “the rest of the story.” Please describe in your own words how you felt about teaching during the pandemic and what factors were most influential in your decision to leave the profession.

The next few questions ask about your participation on professional development focused on science or science teaching. When answering these questions, please include:

- face-to-face and/or online courses
- professional meetings/conferences
- workshops
- professional learning communities/lesson studies/teacher study groups
- coaching and mentoring

Do not include:

- courses you took prior to becoming a teacher
- time spent providing professional development for others (including coaching and mentoring)

31) When did you **last participate** in professional development focused on science or science teaching?

- | | |
|---|---|
| <ul style="list-style-type: none"> ○ In the last 12 months ○ 1–3 years ago ○ 4–6 years ago | <ul style="list-style-type: none"> ○ 7–10 years ago ○ More than 10 years ago ○ Never |
|---|---|

32) Which of the following types of professional development related to science or science teaching have you had in the last three years? *Select all that apply on each row.*

	In Person	Online	Did not attend
a. I attended a professional development program/workshop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I attended a national, state, or regional science teacher association meeting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I completed an online course/webinar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I participated in a professional learning community/lesson study/teacher study group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I received assistance or feedback from a formally designated coach/mentor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. I took a formal course for college credit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33) What is the **total** amount of time you have spent on professional development related to science or science teaching **in the last 3 years**?

- | | |
|--|---|
| <ul style="list-style-type: none"> ○ Less than 6 hours ○ 6–15 hours ○ 16–35 hours | <ul style="list-style-type: none"> ○ 36–80 hours ○ More than 80 hours |
|--|---|

34) Did you complete any of the following types of biology/life science courses at the undergraduate or graduate level? *Select one on each row.*

	Yes	No
a. General/introductory biology/life science courses (for example: Biology I, Introduction to Biology)	()	()
b. Biology/life science courses beyond the general/introductory level	()	()

35. We will select 40 teachers who complete this survey to participate in a follow-up video conference interview. These one-on-one interviews will last approximately 45-minutes and will cover many of the same topics as the survey, but in greater depth. All teachers who participate in a follow-up interview will receive a \$75 honorarium.

Would you be willing to take part in a follow-up interview if selected? (Your indication of interest now does not obligate you to participate. You can change your mind later and decide not to participate.)

- Yes
- No