

1. What grade level do you primarily teach?

Mark only one oval.

- ☐ Middle School (grades 6-8)
- ☐ High School (grades 9-12)
- ☐ Other

2. What subject area(s) do you teach?

Check all that apply.

- ☐ Biology/Life Science
- ☐ Chemistry
- ☐ Physics
- ☐ Physical Science (combined Physics & Chemistry)
- ☐ Earth Science
- ☐ Astronomy/Space Science
- ☐ Integrated/General Science
- ☐ Engineering
- ☐ Other: _____

3. What modes of instruction has your school used during COVID-19?

Check all that apply.

- ☐ In-person (all students coming to school)
- ☐ Hybrid (with students only coming to school on some days)
- ☐ Hybrid (with some students coming to school and others learning virtually)
- ☐ Virtual (all students learning from home)
- ☐ Other: _____

4. On average, about how long have you CONSECUTIVELY taught at least some students virtually? (In other words, if your school has used multiple modes of instruction, how long do you usually teach virtually before your school switches to in-person or hybrid learning)?

Mark only one oval.

- ☐ 1 - 2 weeks
- ☐ 1 month
- ☐ 2 - 3 months
- ☐ 4 months or more

5. Approximately how much TOTAL time have you taught at least some students virtually?

Mark only one oval.

- ☐ 1 - 2 weeks
- ☐ 1 month
- ☐ 2 - 3 months
- ☐ 4 - 5 months
- ☐ 6 months or more

6. During the time(s) when you have taught VIRTUALLY, how much SYNCHRONOUS time (i.e. you and all students logged on at the same time) have you taught per week?

Mark only one oval.

- ☐ Less than an hour
- ☐ 1 - 2 hours
- ☐ 3 - 4 hours
- ☐ 5 hours or more

7. During the time(s) when you have taught VIRTUALLY, how much ASYNCHRONOUS time have you taught per week? (e.g. how much time are students "expected" to spend on your class, how much work have you assigned)

Mark only one oval.

- ☐ Less than an hour
- ☐ 1 - 2 hours
- ☐ 3 - 4 hours
- ☐ 5 hours or more

8. About how many of your students have sufficient technology (e.g. device access, device functionality, internet speed) to complete work for virtual learning?

Mark only one oval.

- ☐ Less than 10%
- ☐ About 25%
- ☐ About 50%
- ☐ About 75%
- ☐ More than 90%

9. Is there anything else about your virtual teaching situation not covered by the previous questions that you want to share?

Teaching Strategies

For the remainder of the survey, consider only your VIRTUAL teaching experiences (i.e. teaching students who are not coming into the school building, and are engaging in class with digital tools. This could include situations where some students are learning virtually even if others are coming into the building, i.e. a hybrid teaching situation, but in that case, consider only what you do for those students who are NOT coming into the school building.)

10. During VIRTUAL teaching, how frequently do you engage students in each science practice? (Rarely = about once a month; Sometimes = several times a month/about once a week; Often = several times a week. For definitions of the practices, refer to NGSS Appendix F <https://www.nap.edu/read/18290/chapter/12>).

Mark only one oval per row.

	Never	Rarely	Sometimes	Often
Asking Questions/Defining Problems	☐	☐	☐	☐
Developing & Using Models	☐	☐	☐	☐
Planning & Carrying Out Investigations	☐	☐	☐	☐
Analyzing & Interpreting Data	☐	☐	☐	☐
Mathematics & Computational Thinking	☐	☐	☐	☐
Constructing Explanations/Designing Solutions	☐	☐	☐	☐
Arguing from Evidence	☐	☐	☐	☐
Obtaining, Evaluating, & Communicating Information	☐	☐	☐	☐

For the following questions, consider "strategies" to include activities, digital tools, or things that you do or ask students to do. As you list strategies, focus on those that you have found to really engage students in the practice: What strategies have seemed to result in most, if not all, students participating, and have put the "thinking work" on students? For example, virtual labs may relate to Planning and Carrying Out Investigations, but an activity where students follow provided directions rather than developing their own investigation would probably not.

If you do not feel like you have engaged students in the practice, you may say "none".

11. What are some strategies you have used to engage students in ASKING QUESTIONS/DEFINING PROBLEMS virtually? (This could include activities, digital tools, etc.)

12. What are some strategies you have used to engage students in DEVELOPING & USING MODELS virtually? (This could include activities, digital tools, etc.)

13. What are some strategies you have used to engage students in PLANNING & CARRYING OUT INVESTIGATIONS virtually? (This could include activities, digital tools, etc.)

14. What are some strategies you have used to engage students in ANALYZING & INTERPRETING DATA virtually? (This could include activities, digital tools, etc.)

15. What are some strategies you have used to engage students in MATHEMATICS & COMPUTATIONAL REASONING virtually? (This could include activities, digital tools, etc.)

16. What are some strategies you have used to engage students in CONSTRUCTING EXPLANATIONS/DESIGNING SOLUTIONS virtually? (This could include activities, digital tools, etc.)

17. What are some strategies you have used to engage students in ARGUING FROM EVIDENCE virtually? (This could include activities, digital tools, etc.)

18. What are some strategies you have used to engage students in OBTAINING, EVALUATING, & COMMUNICATING INFORMATION virtually? (This could include activities, digital tools, etc.)

Challenges

I am also interested in the challenges teachers face in engaging students in science practices virtually. The next set of questions will ask about how difficult it is for you to engage students in each practice and why. Again, consider only your VIRTUAL teaching experiences.

19. How difficult has it been to engage students in ASKING QUESTIONS/DEFINING PROBLEMS during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

20. Explain why you rated ASKING QUESTIONS/DEFINING PROBLEMS the way you did.

21. How difficult has it been to engage students in DEVELOPING & USING MODELS during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

22. Explain why you rated DEVELOPING & USING MODELS the way you did.

23. How difficult has it been to engage students in PLANNING & CARRYING OUT INVESTIGATIONS during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

24. Explain why you rated PLANNING & CARRYING OUT INVESTIGATIONS the way you did.

25. How difficult has it been to engage students in ANALYZING & INTERPRETING DATA during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

26. Explain why you rated ANALYZING & INTERPRETING DATA the way you did.

27. How difficult has it been to engage students in MATHEMATICS & COMPUTATIONAL THINKING during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

28. Explain why you rated MATHEMATICS & COMPUTATIONAL THINKING the way you did.

29. How difficult has it been to engage students in CONSTRUCTING EXPLANATIONS/DESIGNING SOLUTIONS during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

30. Explain why you rated CONSTRUCTING EXPLANATIONS/DESIGNING SOLUTIONS the way you did.

31. How difficult has it been to engage students in ARGUING FROM EVIDENCE during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

32. Explain why you rated ARGUING FROM EVIDENCE the way you did.

33. How difficult has it been to engage students in OBTAINING, EVALUATING, & COMMUNICATING INFORMATION during virtual learning?

Mark only one oval.

	1	2	3	4	5	
Easy	☐	☐	☐	☐	☐	Hard

34. Explain why you rated OBTAINING, EVALUATING, & COMMUNICATING INFORMATION the way you did.

Support

I am also interested in how teachers have been supported in transitioning to virtual learning. The following questions ask about various supports you may (or may not) have received in teaching virtually.

35. For each of the following forms of support, indicate how useful you have found it in terms of transitioning to TEACHING SCIENCE PRACTICES VIRTUALLY. If you have not received any support in that form, choose "Have not received".

Mark only one oval per row.

	Not helpful	A little bit helpful	Reasonably helpful	Very helpful	Have not received
Whole-staff meetings	☐	☐	☐	☐	☐
Department meetings/Meeting with science teacher colleagues	☐	☐	☐	☐	☐
Training on how to use specific digital tools	☐	☐	☐	☐	☐
Training on virtual teaching strategies	☐	☐	☐	☐	☐
Connecting with teachers from other schools (e.g. via Twitter, Facebook groups)	☐	☐	☐	☐	☐
Individual research (e.g. searching online for strategies, reading articles)	☐	☐	☐	☐	☐
Other (please describe below)	☐	☐	☐	☐	☐

36. If you indicated in the previous question that you have received "Other" forms of support, please describe them below.

37. For the supports that you described as "reasonably" or "very" helpful, what made them helpful?

38. For the supports that you described as only "a little bit" or "not" helpful, what made them not helpful?

39. What are some areas you would like more training/support in? (e.g. increasing student engagement, using virtual labs, virtual assessment...)

Conclusion

40. Is there anything else about teaching science virtually that you'd like to share?

41. If you would be willing to participate in a follow-up interview to gather more information about your virtual teaching, please provide your e-mail address below.

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