



## Safer Remote Instructional Guide for Elementary School Science

Due to the COVID-19 pandemic, transitioning to virtual learning and at-home instruction has become commonplace internationally. This has created challenges for all teachers, but especially for STEM teachers. The philosophy of the [Next Generation Science Standards \(NGSS\)](#) for elementary grades encourages students to design and perform activities, and teachers have embraced this. However, translating this to a virtual setting is not easy. Additionally, trying to create safer science learning experiences when students are at home and not under the direct supervision of their teacher warrants concern due to the inherent risks associated with any investigation.

Below are guidelines for safer online instruction for administrators, elementary school teachers, parents/guardians, and elementary school students. This reference guide should be viewed as an instrument for developing a safer instructional setting for elementary school students for at-home or virtual learning. However, it should not be viewed as an absolute interpretation of each specific educational institution's guidelines. Legal safety standards and better professional safety practices are expected for all circumstances, as is following policies, regulations, and guidelines issued by the respective school, district, and state.

### Administrators

- Administrators should hold individual or departmental meetings with teachers to clearly define any and all at-home science investigations during remote learning situations.
- Administrators should establish procedures for having teachers develop weekly detailed lesson plans, including safety precautions, and have them made available to be reviewed to ensure appropriate science standards are met.
  - When alternative or modified investigations are needed (reasoning includes but are not limited to: the student is unable to obtain the proper materials, unable to have adult supervision, or the student is unable to obtain or properly wear the necessary Personal Protective Equipment [PPE]), a revised lesson plan should be requested and reviewed.
- Administrators can request to review the hazard analysis, risk assessment, and safety actions to be taken supplied by each teacher and review any procedures that include biological, chemical, or physical hazards.
- Administrators can request to review any revised safety agreements to include remote instruction.
- Administrators should ensure that the teacher has planned for and has been supplied the necessary PPE for any pertinent activity/investigation.
- Administrators must remind their teachers of their [Duty or Standard of Care](#) to the students.

### Teachers

- Teachers should prepare a weekly detailed lesson plan in case administration requires its preapproval. It should clearly demonstrate that it meets appropriate science standards that include but are not limited to: detailed instructions for activities or investigations or projects and a detailed list of materials required for investigations.
- To better align with and address NGSS, students are often asked to design their own investigations or make models. Student-designed procedures should be approved by the teacher before the actual activity is performed. Students and parents/guardians should be made aware of this requirement.
- Teachers should refer to [Safety in Elementary Science](#) for guidance on safety when planning lessons and activities/investigations to be performed in school or at home.
- Teachers must prepare a comprehensive hazard analysis, risk assessment, and list of safety actions to be taken for each relevant at-home activity/investigation.
- Teachers must revise any pre-existing safety agreements to include remote instruction that is

preapproved by administration.

- If no pre-existing safety agreement has been made, one should be prepared.
- For reference: [NSTA Sample Safety Acknowledgement Document](#).
- Teachers should include the [COVID-19 Pandemic Safer Science/STEM Online and Face-to-Face Learning Environments Instruction Disclaimer Statement](#) with each activity/investigation assigned to students.
- Teachers must review any video in its entirety that demonstrates the at-home activity/investigation before assigning it to ensure that it uses better legal safety standards and professional practices, that it displays and meets appropriate science standards or performance expectations, and is age appropriate.
  - In absence of an appropriate video, teachers should provide a recorded video of themselves performing the investigation and clearly depict the necessary aspects of the at-home experiment as stated above.
    - Do not perform any activity/investigation in a kitchen and depict tasting any non-food substance.
  - For reference: [NSTA Minimum Safety Practices and Regulations for In-Person and Virtual Sessions](#).
- Teachers should supply an alternative activity/investigation for the student to complete at home that meets the appropriate science standards or performance expectations.
- Teachers must supply the students and parents/guardians with clear and unambiguous written procedural instructions.
- Teachers must supply the students and parents/guardians with a comprehensive and thorough list of all materials, including the names and chemical formulas of reactants and products involved for each at home activity/investigation, possible inherent hazards and risks associated with the at-home activity/investigation, the relevant Safety Data Sheet (SDS), and the inclusion of proper waste and disposal procedures that is in compliance with local and state regulations put forth by the SDS in Section 13, Disposal Considerations.
  - Chemicals used in the home setting should be limited to only common household products that have a safety classification of zero to two on the SDS based on the Hazardous Materials Identification System (HMIS). Appropriate PPE should still be used even when household products are used.
- Teachers must provide adequate PPE to each student and supervising parent or guardian if at-home activity/investigations include hazardous substances or materials.
  - If the teacher is unable to provide or distribute the proper PPE, the teacher should forgo this investigation and provide an alternative at-home investigation and update the lesson plan.
- Teachers should be aware of the need to provide translations of directions for students in non-English speaking households.
- Teachers should be aware of the need to modify any assignments or activity/investigation in support of students with disabilities.
  - For reference: [An Educator's Guide to Virtual Learning: 4 Actions to Support Students with Disabilities and Their Families](#).
- Teachers should familiarize themselves with NSTA resources: [NSTA: Safety for Hands-on STEM Home Instruction](#) and [NSTA: Safety Recommendations for Opening the New School Year](#).
- Teachers should be aware of any resources and/or reopening plans provided by their respective State Department of Education or Public Instruction, or State Education Agency.
- Teachers should be aware of their [Duty or Standard of Care](#) to the student, even in the presence of at home investigation.

### **Parents/Guardians**

- Parents/Guardians should view any video in its entirety supplied by the teacher to confirm that it is age appropriate and that they fully understand the task required.
- Parents/Guardians must read, sign, and return the safety agreement provided by the teacher.
- Parents/Guardians should be present during the at-home activity/investigation or project or can confirm that adult supervision has been secured.
- Parents/Guardians should notify the teacher if they are uncomfortable or unable to perform the at-home

activity/investigation or project and request an alternative assignment.

- Parents/Guardians should not change investigation instructions or substitute materials without consulting the teacher.
- Parents/Guardians should not override safety measures stated by the teacher.
- Parents/Guardians should be aware they can request any assignments or activity/investigation to be translated into their language of preference.
- Parents/Guardians should be aware they can request any assignments or activity/investigation in support of their student with disabilities.
  - For reference: [A Parent's Guide to Virtual Learning: 4 Actions to Improve Your Child's Experience with Online Learning.](#)
- Parents/Guardians should comply with all local and state regulations put forth by the SDS in Section 13, Disposal Considerations, when disposing of any materials from the at-home investigation.

### **Students**

- Students must read, sign, and return the safety agreement provided by the teacher. · Students must read, sign, and return any virtual classroom rules/behavior agreement before beginning the activity/investigation.
- Students must accurately follow the written instructions provided by the teacher.
- Students should only perform at-home activities/investigations as instructed by the teacher and with adult supervision.