



Safer Remote Instructional Guide for Science Grade Levels 6–12

When schools must be closed, science teachers will look for ways for students to engage in hands-on activities while they receive instruction remotely. Research has shown that students learn science most effectively when they are engaged in asking questions, conducting investigations, and drawing their own conclusions. For students to have these experiences outside the classroom, teachers and administrators must regard safety as a paramount concern.

Below are guidelines for safer online/at-home instruction for administrators, teachers, parents/guardians, and students for grade levels 6–12. Legal safety standards and better professional safety practices are expected to be followed in all circumstances. This document is meant as a guide; each educational institution may have its own policies that must be followed from the respective school, district, local municipality, state and federal governments, and professional associations.

Administrators

- Administrators should meet with their departments to discuss any at-home investigations to be assigned, the equipment needed, and the procedures that students will be expected to perform.
- Administrators should work with their department to brainstorm potential problems with the at-home investigations so they can warn students and parents about them before any investigation takes place.
- Administrators should be aware of the circumstances of the families in their communities so investigations are not assigned to students that would not have the resources or supervision to perform.
- Administrators should ensure that students are always given alternative assignments that they can do without penalty or embarrassment if carrying out an investigation is impossible.
- Administrators should require teachers to do a thorough hazard analysis and risk assessment, review all procedures and equipment needed prior to any investigation is assigned for students to do at home. If any safety hazard with potential resulting risk is foreseen that cannot be addressed through safety actions (e.g. engineering controls, operating procedures, and/or personal protective equipment [PPE]), the investigation should not be done outside the school building.
- Administrators should ensure that students are specifically told to conduct only the specific investigation assigned and depending upon the age of the student and

any disability, not to work alone without direct adult supervision.

- Working together, administrators and teachers should use their standard safety acknowledgement form to create an at-home science safety agreement and ask parents and students to sign and return the document. This can be done using a platform such as Google Forms, which will allow the forms to be stored electronically and printed, if necessary. For reference: [Safety acknowledgement form for grades 9–12](#) and [safety acknowledgement form for grades 6–8](#).
- Administrators also should create a disclaimer form that must be signed by parents and students. NSTA has a sample Disclaimer Form titled [COVID-19 Pandemic Safer Science/STEM Online and Face-to-Face Learning Environments Instruction Disclaimer Statement](#).
- Administrators should ensure that if an investigation involves chemicals, even household chemicals, a Safety Data Sheet (SDS) is provided. Household chemicals can be just as dangerous as those in the lab, and students and parents must be made aware of those dangers.
- Administrators and teachers can work together to provide students with materials in a pick-up-and-go format if students do not have access to the necessary materials in their homes.
- Administrators must ensure that if goggles and gloves are required, the school makes this PPE available to students. Students/families should be surveyed for allergies so that appropriate PPE can be distributed.
- Administrators must ensure that detailed instructions about how chemicals should be disposed of appropriately are provided to families. Any chemical that cannot safely go down the drain or into the garbage and is harmful to the environment should not be used outside of the school building.
- Administrators should ask teachers to model for their students, through a video or a screencast, what they are being asked to do.
- Administrators should know when the investigations are being assigned and ensure that the teacher is available to clarify procedures and troubleshoot problems. This will enable teachers to make sure that their directions are explicit enough for their students to follow.
- Administrators must ensure that translations of directions are available to students so that misunderstandings due to a language barrier can be avoided. This is particularly important for younger students in non-English-speaking households.

Teachers

- Teachers must provide an at-home science safety agreement for students/parents to sign and return. No investigations should be done until the safety agreement has been signed and returned.
- Teachers should create and use a disclaimer form, which also must be signed by parents and students. NSTA has a sample Disclaimer Form titled [COVID-19 Pandemic Safer Science/STEM Online and Face-to-Face Learning Environments Instruction Disclaimer Statement](#).

- Teachers should develop a standard safety acknowledgement form to create a home science safety agreement and ask parents and students to sign and return the document. This can be done using a platform such as Google Forms, which will allow the forms to be stored electronically and printed, if necessary. For reference: [Safety acknowledgement form for grades 9–12](#) and [safety acknowledgement form for grades 6–8](#).
- In their lesson plan, teachers should include the standards to be addressed and any investigations or projects that will take place.
- Teachers should include a detailed list of materials in the lesson plan, as well as how the materials will be provided for students who are at home if they do not have them.
- Teachers must do a hazard analysis, risk assessment, and a thorough review of all equipment and procedures. If any safety hazard with potential resulting risk is foreseen that cannot be addressed through safety actions (e.g. engineering controls, operating procedures, and/or PPE), the investigation should not be done outside the school building.
- Teachers must provide clearly written instructions, and model what students are to do through a video or screencast. This will allow the students to see what the investigative setup looks like and understand what they are expected to do.
- Teachers must remind students that safety is important even though they are at home. Instruct students that they should work with an adult and should never work alone.
- Teachers must remind students that household chemicals can be just as dangerous as those in the lab, so they should follow the classroom safety rules when performing any laboratory or field investigations.
- Teachers should instruct students to only do the lab as written, and DO NOT mix chemicals unless instructed to do so.
- Teachers should provide a list of chemical hazards and SDS for students/parents. Information must also be included about how to dispose of all lab materials appropriately. If a chemical cannot be disposed of safely at home and is harmful to the environment, it should not be used.
- Teachers should instruct students what to do if they spill a chemical while doing an investigation.
- Teachers should be accessible to help clarify procedures and troubleshoot problems while the students are working on their investigation.
- Teachers should be aware that their [Duty or Standard of Care](#) to their students is still in effect even if their students are learning remotely. This means that teachers must take every precaution to ensure that what they are asking students to do outside the classroom is as safe as possible. Teachers retain liability for the instructions they give to students. School districts will share in that liability as the teacher's employer. These legal issues make it all the more critical for teachers to take the time to do a hazard analysis and risk assessment of every activity they ask their students to do outside the classroom and to get authorization from their

supervisor to ask students to carry out these investigations remotely.

- Teachers must supply students with appropriate PPE to carry out activities at home, and if that is not possible, the investigation should not be conducted outside of the school building.
- Teachers whose classes include students with disabilities and English as a New Language (ENL) students must make certain that their investigations can be modified to meet these students' needs.
- Teachers should ensure that any video they ask their students to watch follows better professional practices for safety and is appropriate for the students' age group.
- Teachers should provide students/families with alternative assignments if students are unable to complete the investigation for any reason.

Parents/Guardians

- Parents should read and sign the appropriate safety acknowledgement form based on the grade level provided ([safety acknowledgement form for grades 9–12](#) and [safety acknowledgement form for grades 6–8](#)) and the [disclaimer statement before](#) their child begins any at-home investigations.
- Parents/guardians should view the entire video that the teacher provides of the setup of an investigation to ensure that they thoroughly understand what their child is being asked to do.
- Parents/guardians who are uncomfortable with or unable to perform the investigation should notify the teacher and request an alternative assignment.
- Parents/guardians should discuss any disabilities their child has with the teacher so the teacher will be aware of modifications needed to allow the student to gain the most benefit from the assignment.
- Parents/guardians must ensure their child does not work without direct adult supervision.
- Parents/guardians should carefully review any SDS supplied by the teacher and ensure that chemicals are disposed of safely and in a way that is not harmful to the environment.
- Parents/guardians should make sure that the investigation being performed has been approved by the teacher.
- Parents/guardians could have some items on hand for investigations, if possible, such as vials, eye droppers, magnifiers, balloons, safety goggles, funnels, disposable gloves, vinegar, baking soda, food coloring, dishwashing soap, measuring spoons, plastic mixing and storage containers, and a waterproof tablecloth. (Some of these items could be sent home by the teacher.)

Students

- Students must read and sign the appropriate safety acknowledgement form based on the grade level ([safety acknowledgement form for grades 9–12](#) and [safety acknowledgement form for grades 6–8](#)) and [disclaimer form](#) provided by the teacher.
- Students must read carefully any written instructions provided by their teacher

before they begin the investigation.

- Students should only perform the investigation assigned by the teacher.
- Students should not begin any investigation without supervision by an adult.