



ALSDE Guidance for COVID-19 Lab Material/Equipment Use **Quick guide version also available at www.amsti.org**

As science teachers, our goal is to have a safe, engaging laboratory environment which allows us to provide our students with authentic, hands-on learning opportunities. The three-dimensional nature of our 2015 Alabama Course of Study: Science emphasizes student-centered investigations that foster problem-solving, reasoning, data collection, and discovery. Students in science classrooms are natural scientists and are eager to explore the environment around them. Science teachers have the responsibility of planning safe student-centered investigations that address the three dimensions of scientific and engineering practices, crosscutting concepts, and disciplinary core ideas.

Science safety in K-12 science classrooms should be considered by all Alabama educators. Everyone is expected to model and display good safety habits at all times and set appropriate safety expectations. By becoming familiar with classroom experiments and always following proper safety procedures, you can prevent or eliminate most classroom accidents. Science experiments are designed with safety in mind; however, accidents can and will happen, which is why everyone should be aware of potential problems and take necessary and appropriate precautions.

COVID-19 Considerations for Hands-On Activities

In preparation for the 2020-2021 school year, science teachers will have to modify normal instructional practices to prevent the spread of viruses and other disease-causing organisms.

- ❖ Teachers and school leaders should consult with the following agencies throughout the school year:
 - [Center for Disease Control \(CDC\)](#)
 - [Alabama Department of Public Health \(ADPH\)](#)
 - [The RoadMap to Reopening Schools](#)
 - [The Alabama K-12 Science Safety Guidelines](#)
 - Local Education Agency (LEA) Policies and Procedures
- ❖ Do students have to complete the hands-on activity to master the three-dimensions of the standard? If not, consider alternative methods for investigations.
 - A teacher could perform the physical aspects of the investigation as a demonstration or as a video recording, which would then be used by students for analysis and explanations. The use of cameras and large-scale projection can enhance this practice.
 - Pre-recorded videos and computer simulations are also alternative methods for investigations.
 - Refer to the [AMSTI K-12 Science Remote Learning Resources](#) for additional alternatives by grade level and standard.
- ❖ Build in time for the sanitation of surfaces (desks, lab tables, partitions, doorknobs, etc.), lab equipment, materials, and personal protective equipment (PPE) such as safety goggles, gloves, and aprons before and after use with students.
 - AMSTI will be sanitizing and/or quarantining materials and equipment in between schools.



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- Schools and/or LEAs will need to provide supplies for sanitizing and PPE to teachers for classroom use.
- Goggles should be cleaned before and after each use.
 - There are mixed messages on whether ultraviolet light, such as in goggle sanitizer cabinets, are effective in disinfecting viruses. Visit the following website for guidance for cleaning goggles during COVID-19.
 - [Cleaning and Disinfecting of Safety Goggles and Visors](#)
- If there is a possibility of an adverse reaction between chemicals used in the hands-on activity and sanitizing chemicals, consider using chemical alternatives in the experiment.
- ❖ Have students wash hands or use hand sanitizer before and after laboratory experiments and activities, especially if sharing materials and/or equipment.
 - If students are working near each other in small groups, they should all wear masks
- ❖ Remove unnecessary items that could need sterilizing, such as excess glassware and reagent bottles.
- ❖ Consider using disposable materials and small-scale practices to reduce sanitation needs. Give attention to safe and sanitary disposal methods for chemicals, supplies, materials, and personal items.
 - Refer to Flinn Scientific's "[Disposal Methods](#)" page for disposal resources (free login required).
 - Be sure to check with your LEA for additional local disposal guidelines.
- ❖ Provide adequate spacing of students and staff. The spacing could be encouraged through markings on tables and floor, and the placement of desks. Partitions that can be sanitized can be placed between lab stations.
- ❖ Consider the available ventilation, including exhaust fans and window openings. Fume hoods provide little ventilation for the entire room. Odors from activities might irritate sensitive lungs and eyes.

COVID-19 Considerations for Grouping Students

Science learning relies on the interaction between students and teachers and among students to construct science knowledge and skills. During face to face instruction, science teachers may need to modify the normal practices of having students work in pairs, such as lab partners, and small groups. Here are some considerations for maintaining those interactions and yet avoid the spreading of disease:



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- ❖ Include instruction that teaches the routines and procedures that students should use in the class and the lab.
 - Consider the traffic flow when distributing materials and other movements. Minimize the number of students that need to move.
 - Establish personal student practices such as wearing masks, washing hands, and sharing materials. These practices should align with those established by the CDC, ADPH, and your LEA.
- ❖ Modify grouping practices.
 - For physical investigations, one student could perform the investigation and share their observations with peers who remain at a proper distance.
 - The student performing the experiment could make a video recording to share observations.
 - The group could share data analysis and the development of explanations through an online learning management system and/or video conferencing.
- ❖ Flipped-classroom methods, such as the recording of lectures, demonstrations, and assignment directions could reduce the time allotted to direct instruction.
 - This would also allow time for meaning-building opportunities such as laboratory experiments and student discourse and collaboration during face to face instruction.

COVID-19 Considerations for Hybrid/At-Home Instruction:

Here are some additional items to consider for hybrid science instruction involving at-home activities during COVID-19:

- ❖ Safety considerations are paramount. Plan for anything that could go wrong, especially considering that the students might not have adult support and supervision.
 - Share The National Science Teaching Association's (NSTA) [Safety for Hands-On Science Home Instruction](#) with parents/guardians before requiring any at-home lab activities.
 - Have both students and their parent/guardian sign NSTA's at-home safety acknowledgement form as they would for face to face instruction (visit previous link).
 - Document at-home safety considerations in student materials, parent guidance, and teacher lesson plans.
 - Obtain permission from a parent/guardian before sending anything questionable home to students. Do not assume there will be adult supervision at home.
- ❖ Personal Protective Equipment (PPE) is to be provided by the school or parent/guardian before the completion of any investigation with safety considerations.



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- Pay attention to the needs for at-home eye protection, gloves, hand washing, and disposal.
 - Eye protection, such as goggles or protective glasses, should be worn with any at-home activity or experiment that includes the use of common household substances, sharp objects, and projectile objects.
 - If proper PPE is not available, the laboratory experiment or activity should not be conducted outside of the classroom setting.
- ❖ Safety data sheets should be reviewed before indicating the use of any household substances in an activity.
- The use of household substances or kitchen supplies should be limited to those that have a safety classification as 1 on the Safety Data Sheet (SDS). For example, vinegar should not be used without appropriate personal protective equipment because of the safety label of 2. Safety hazard information can be found at the following website: [GHS Hazard Classification: Everything You Need to Know](#)
 - Safety Data Sheets can be found in safety materials for the activity or through searching the internet for "SDS <chemical/substance name>." For detailed information about reading a Safety Data Sheet, review the following:
 - Video: [Safety Data Sheets](#)
 - OSHA Quick Card: [Hazard Communication Safety Data Sheets](#)
- ❖ Examine any videos you assign to students for safety practices. Do they use proper eye protection? Do they give the students ideas for dangerous activities that students might try?
- The statement of "Don't try this at home" is NOT adequate protection from injury and liability.
- ❖ For some investigations, the teacher could video record physical aspects of the investigation for students to make observations.
- Data analysis and the development of explanations through an online learning management system and/or video conferencing.
 - Narrative descriptions could provide experience for students without electronic capabilities.
- ❖ Provide means for students to have productive discussions with their peers or family members about the topic, investigation, or project.
- Some mechanisms include phone conversations, electronic dashboards, and video conferences.