



ARKANSAS K-12 SCIENCE STANDARDS

EDUCATION FOR A NEW GENERATION

Guidance for Science Lab Safety and Instruction in Arkansas K-12 schools During COVID-19 Pandemic

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To assist schools to be [Ready for Learning](#) this Fall, DESE STEM Unit is providing a set of considerations and recommendations for safe and equitable science teaching and learning during the Covid-19 Pandemic. These offer districts guidance when preparing safe science classroom environments that support the use of science and engineering practices when teaching [science content](#).

Science learning for all students is better served by attending to equity and access. Whether teaching science onsite or remotely, prioritize what is meaningful, responsive to the needs of the community, and place-based. Science investigations and student safety are key components of equitable science teaching and learning. Teachers may need to modify normal science instructional practices to ensure equitable access to science instruction for all students while safely preventing the spread of viruses and other disease causing organisms. The following are some considerations for in-person and at-home/remote science instruction.

Recommendations for In-Person Science Instruction		
Considerations for Science Teaching and Learning	Recommendations	Resources
Science Safety	1. Adhere to the Arkansas 6-10-113 Eye Protection Safety Act. Teachers and students need their own personal eye protective devices. If not possible, sanitize	1. Arkansas Division of Elementary and Secondary Education:

	<p>classroom supply of eye goggles according to CDC guidelines (bottom of page) before being used by another student/teacher.</p> <p>Teach and reinforce handwashing with soap and water for at least 20 seconds and increase monitoring to ensure adherence among students/teachers. Students/teachers should wash hands prior to putting on goggles and prior to removing them.</p> <p>UV sterilization is not proven (yet) to be effective against Covid-19 because it only sanitizes surfaces.</p> <p>2. When using chemicals in lab environments, ensure that chemicals will not react adversely to the presence of bleach or other chemical cleaners used to disinfect surfaces and lab equipment. When EPA-approved disinfectants are not available, alternative disinfectants can be used.</p> <p>3. Consider all lab engineering inspection protocols.</p> <p>HVAC (exhaust fans, filters, CO2 sensors, fresh air vs. windows). Fume hoods provide little ventilation for an entire room. Air should not be circulated back into the facility.</p> <p>Fume Hoods and Fire Extinguishers (annual inspections)</p> <p>Eye Wash Stations and Safety Showers (flush weekly)</p> <p>Gas line shut offs</p>	<p>AR 6-10-113. Eye Protection</p> <p>Centers for Disease Control (CDC) - Strategies for Optimizing the Supply of Eye Protection</p> <p>2. List N: Disinfectants for Use Against SARS-CoV-2 (COVID-19)</p> <p>3. Reopening K-12 Schools During the Covid-19 Pandemic</p> <p>CDC Guidance for General Lab Safety Practices during the Covid-19 Pandemic</p>
Science Learning Spaces	<p>1. Develop a schedule for increased, routine cleaning/disinfection in science learning environments. Plan for the sanitation of surfaces (desks, lab tables, partitions, sink fixtures, etc.), lab equipment, materials, and personal protective equipment (PPE) (cloth masks, safety glasses, gloves, aprons). Sanitize items before being used by another student/teacher.</p>	<p>1. Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes</p>

	<p>Do not schedule multiple groups to use the same lab station without disinfecting the station, space, surfaces, and equipment in between use. Older students could assist in the disinfection only under adult supervision.</p> <p>2. Provide adequate spacing of students and staff according to the AR Departments of Education and Health guidelines. The spacing could be encouraged through markings on tables, the floor, and the placement of desks. Partitions that can be sanitized can be placed between lab stations. Use of sanitizers requires appropriate training of use in the workplace.</p> <p>3. Modify grouping practices. Group students into small groups of nine or less with one teacher to reduce contact with others. For lab investigations, one student could perform the investigation and share the observations with group partners who remain at a proper distance. The student performing the experiment could make a video recording to share observations and data.</p> <p>4. Use school grounds (outdoors) and nearby public spaces for science instruction.</p>	<p>List N: Disinfectants for Use Against SARS-CoV-2 (COVID-19)</p> <p>2. Arkansas Department of Education Guidance for schools Regarding Covid-19</p> <p>3. Reopening K-12 Schools During the Covid-19 Pandemic</p> <p>4. American Academy of Pediatrics - Covid-19 Planning Considerations: Guidance for School Re-entry</p>
Science Materials	<p>1. Avoid sharing of materials (e.g., electronic devices, probes, measuring tools/scales, lab equipment, lab books, science manipulatives). To minimize the sharing of materials, assign each student their own consumable supplies/equipment or limit use of supplies/equipment to one group of students at a time. If difficult to disinfect, do not use the materials.</p> <p>Consider traffic flow when distributing materials. Minimize the number of students that need to move.</p> <p>Keep student belongings separated from others and in individually labeled containers/areas.</p>	<p>1. American Academy of Pediatrics - Covid-19 Planning Considerations: Guidance for School Re-entry</p>

Recommendations for Science Instruction At-Home/Remotely

Considerations for Science Teaching and Learning	Recommendations	Resources
Science Safety	<p>1. Avoid the use of sharp objects, heated objects, breakable items, or handle chemicals, plants, and animals when adult supervision is not insurable.</p> <p>Emphasize and demonstrate safety precautions throughout in-person and remote teaching and learning.</p> <p>Examine any videos assigned to students for safety practices (use of proper eye protection, chemical disposal, potential dangerous activities).</p> <p>2. Limit use of household chemicals/kitchen supplies to those that have a safety classification of a 1 on the Safety Data Sheet (SDS). SDS should be reviewed before using any household substances in an activity. SDS can be found by searching the internet for "SDS <chemical name>." For example, vinegar should not be used without appropriate PPE because of the safety label of 2.</p> <p>3. Personal Protective Equipment (PPE) is to be provided by the school or parent prior to any investigation with safety considerations. Eye protection (goggles or protective glasses) should be worn with any activity or investigation that includes the use of chemicals (including common household chemicals), sharp objects, and projectile objects. If proper PPE is not available and adult supervision is not insurable, the activity should not be conducted outside of the classroom setting.</p>	<p>1. NSTA Minimum Safety Practices and Regulations for In-Person and Virtual Sessions</p> <p>NSTA Safety Blog</p> <p>2. GHS Hazard Classification: Everything You Need To Know</p> <p>3. American Academy of Pediatrics - Covid-19 Planning Considerations: Guidance for School Re-entry</p>
Science Teaching and	<p>1. Leverage science to meet the learning targets of ELA and mathematics. Science investigations provide meaningful contexts for students to engage in reading, writing,</p>	<p>1. Supporting Students' Science Learning</p>

<p>Learning at Home/Remotely</p>	<p>and mathematics, building core knowledge, and content-rich vocabulary, particularly for ELs for whom science learning provides a rich context for language development.</p> <p>Use virtual instructional methods (recording of lectures, demonstrations, assignments) to reduce the time allotted to direct instruction and encourage lab experiments/activities during in-school instructional time.</p> <p>Provide opportunities for students to have productive discussions (phone conversations, electronic dashboards, video conferences) with their peers/family members about the topic, investigation, or project.</p> <p>Focus on the use of formative assessments rather than traditional testing in order to gather evidence of student learning/learning gaps for language, conceptual understanding, and metacognition.</p> <p>Connect science phenomena and problems to household activities, like cooking, fixing things, or gardening.</p> <p>Use non-formal educators (community members, nature center staff, scientists, technicians, medical staff, etc.) to provide additional opportunities for teaching and learning science. Follow district protocols for allowing volunteers, non-formal educators, or speakers in physical and virtual classrooms.</p>	<p>During COVID-19 School Closures</p> <p>CCSSO Restart and Recovery Considerations for Teaching and Learning: Academics</p>
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<p>Science Materials</p>	<p>1. Use science notebooks to meet the learning targets of science, ELA and mathematics to allow students to express, clarify, justify, interpret, and represent their ideas in multiple ways, including writing, speaking, and drawing.</p> <p>2. Establish a platform students can return to regularly to add to and revise initial questions throughout instruction using virtual tools such as Padlet, Flipgrid, or Google Jamboard. Utilize digital tools for graphing and data analysis.</p> <p>Use disposable materials. Use safe and sanitary disposal methods for chemicals, supplies, materials, and personal items when used without teacher supervision.</p>	<p>1. Continuing Science at Home, With Science Notebooks</p> <p>2. CCSSO Restart and Recovery Considerations for Teaching and Learning: Academics</p>
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