

Supplemental Information for Science Courses and Laboratory Work for Fall 2020

August 3, 2020

Introduction

As a supplement to DESE's [Guidance for Courses Requiring Additional Safety Considerations \(download\)](#), we are providing districts and schools with additional information regarding science and laboratory work.

Hands-on science and laboratory work experiences are an important part of the learning experience for all students. We strongly encourage schools and districts to continue providing these activities to students this fall. **Adaptations to these courses, however, are necessary to support the safety of students and staff.** Even though these activities require additional logistics, we are confident that they can and should continue this fall, as outlined in the following pages.

These recommendations are being released in early August 2020 and may be revised as we continue to monitor COVID-19 trends and the latest medical research.

In this document, we focus on providing recommendations for science and laboratory work in both in-person and remote settings. Science courses and laboratory work must also follow all previously released DESE reopening guidance, with a specific focus on the following sections:

- “Courses that involve regular sharing of equipment” from the [Guidance for Courses Requiring Additional Safety Considerations \(download\)](#) with key excerpts restated below
- “Appendix B: Laboratory seating” from the [Facilities and Operations Guidance \(download\)](#)

Guidance on sharing of equipment

Require students to wash hands, wear masks, and maintain distance

- Students should wash or sanitize hands before and after using equipment;¹ frequent handwashing is likely the best way to protect against transmission from surfaces.
- Ideally, students should be 6 feet apart. When wearing masks, 3 feet is the minimum distance allowed between students (seat edge to seat edge). Masks must cover the nose and mouth and be on at all times if students are less than 6 feet apart or using shared equipment.

Minimize and modify shared equipment usage

- **Consider lesson plans that minimize the use of shared equipment.**² If feasible, reduce class sizes for classes requiring equipment to reduce the need for equipment sharing.

- **If feasible, procure additional pieces of equipment in order to limit sharing.** This may not be possible for more expensive equipment (e.g., microscopes) but may be possible for other types.
- **Assign specific students to specific pieces of equipment or workstations** that they can use for each class session. This is similar to having assigned seats in classrooms so that specific students are always near the same other students.
- **If there is not enough equipment for each student to have their own, consider creating cohorts, e.g., having students work in pairs or small groups** and keeping those groups the same.
 - One student can physically touch the equipment (e.g., microscope) and the other students can play roles that do not involve physically touching the equipment (e.g., recording results in a lab journal).
 - If it is possible for the students to wipe down/clean the equipment part of the way through class, students can switch roles. Otherwise, students can swap roles in the next class session.
- **Equipment that touches the eyes or mouth (e.g., microscopes) can be shared if a disposable protective cover is added** and students do not breathe directly into the item (for example, musical instruments like brass and woodwinds cannot be shared). Disposable protective covers should be removed, disposed of, and replaced with a new cover between uses, and the equipment should be cleaned between uses by students or custodial staff.
- **Equipment that does not come into contact with the mouth (e.g., beakers) can be shared** if cleaned by students or custodial staff between uses.
- **Do not share equipment or objects that are hard to clean and disinfect** (e.g., any materials with fabric or irregular surfaces).³

Increase shared equipment cleaning

- **Shared equipment should be wiped down before and after each use** (so there are ideally two wipe-downs between each student's use). Students or custodial staff could wipe down/clean equipment as appropriate.
 - An [EPA approved disinfectant](#) should be made available in each room for this purpose. Sufficient inventory of disinfectant supplies should be maintained at all times.
 - Teachers play an important role in proper equipment hygiene. In the classes in which students wipe down/clean their own equipment, teachers should demonstrate how to properly wipe down/clean equipment, reinforce the importance of this practice, and supervise cleaning to ensure it is done correctly.
 - Post signage in all areas with shared equipment reminding students to wipe it down/clean it before and after use.
- **Additionally, shared equipment should be cleaned and disinfected at least daily** as part of building cleaning schedules. Frequently touched surfaces (e.g., handles, buttons) should be cleaned multiple times a day.^{4 5}

Science and laboratory work

Below we offer recommendations for science and lab work that is conducted in school as well as remotely.

General lab guidance for in-school activities

- Follow the guidance on sharing equipment from the [Guidance for Courses Requiring Additional Safety Considerations](#) (*download*).
- Remove unnecessary equipment and materials from lab spaces.
- Consider using outdoor spaces for lab work, as they provide opportunities for optimal physical distancing and investigations.
- Determine which laboratory experiences are highest priority for all students in a grade level or in a discipline and what experiences can be modified or removed for the year.
 - Prepare alternative methods (e.g., videos, simulations, demos) for labs as needed for students to learn the concept.⁶
- After disinfecting shared equipment and person protective equipment (PPE) (safety glasses, goggles, aprons, glassware, etc.), allow the equipment to dry for as long as possible in an area with sufficient ventilation away from students (at least 30 minutes) before use.⁷
 - Consider using disposable materials and small-scale practices (e.g., micro-scale chemistry experiments, which reduce supplies needed) to reduce sanitation needs.
 - Designate a bin or space for students to place materials that need to be disinfected.⁸
 - Wearing protective goggles in school laboratories is required by Massachusetts law (Mass. Gen. Laws c. 71, § 55C). Extra attention should be paid to goggles, as they come into close contact with the face and eyes. Goggles must be disinfected between uses.⁹
- See Appendix XI of the [2016 Science and Technology/Engineering Curriculum Framework](#) for general lab safety guidelines, including for the 2019 OSHA updates to the Safety Practices and Legal Requirements.

General lab guidance for remote activities

If a school is unable to hold in-person lab classes, we strongly recommend labs are conducted by teachers and observed by students instead of having students conduct labs at home. If some form of practical work is done at home during remote learning, we recommend the following guidelines to support student safety and prioritize equitable learning opportunities.

- Supplies to support learning activities should be readily available in homes or provided by the district. No chemicals outside of common household items should be required for an activity. Consider opportunities to distribute materials needed to implement activities before requiring an activity to be completed at home.
- Educators should model (e.g., live, video, in writing) safety practices before assigning labs. Provide students and families with information on materials, procedures, and safety protocols of labs. Provide families with a lab safety acknowledgement form tailored to remote learning. Experiments should be done under adult supervision.

- The use of household chemicals 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 PPE because of the safety label of 2. Safety data sheets should be reviewed beforehand, including the use of any household substances in an activity. Safety hazard information can be found [here](#). Safety Data Sheets can be found by searching the internet for “SDS <chemical name>”.
- Prepare alternative methods (e.g., videos, simulations, demos) for labs as needed for students to learn the concept.

¹ Harvard School of Public Health, [Schools For Health: Risk Reduction Strategies for Reopening Schools](#). (2020, June).

² Harvard School of Public Health, [Schools For Health: Risk Reduction Strategies for Reopening Schools](#). (2020, June).

³ CDC, [Considerations for Schools](#). (2020, May 19).

⁴ CDC, [Considerations for Schools](#). (2020, May 19).

⁵ Harvard School of Public Health, [Schools For Health: Risk Reduction Strategies for Reopening Schools](#). (2020, June).

⁶ Flinn Scientific, [Guidance on Re-Entry to Schools, K-12: Part A](#). (2020)

⁷ Lab Manager, COVID-19: [What You Need to Know and What You Should Do Now](#). (2020, March)

⁸ Association of Library Service for Children, [Best Practices for Cleaning Play and Learning Spaces](#). (2017, April)

⁹ Centers for Disease Control and Prevention, [Considerations for Schools](#). (2020, May)