Science lab safety worksheets high school

Safety Blog Safety for Hands-On Science Home Instruction By Kenneth Roy Posted on 2020-07-28 In advance of the COVID-19 pandemic during the second part of the 2019-2020 academic year, virtual learning has become a viable alternative in many school districts nationwide. At this point, some science/STEM teachers consider and adopt hands-on activities to be completed remotely at home by students. This fall, in the 2020/2021 school year, the need for such domestic, hands-on activities is likely to continue. That's actually nothing new. Teachers have assigned home activities for years, such as science fair projects, non-credit work, general classroom tasks and more. The bottom line is this: Whether hands-on activity is done in a formal academic school laboratory or in the field or at home, all species are a springboard for developing scientific concepts and methodologies. However, it is a double-edged sword. Whether in a formal academic school laboratory or off site, these activities promote scientific education. However, they also introduce legal issues within the obligation or standard of care. In essence, an obligation or standard of care is defined as an obligation, recognised by law, requiring compliance with a certain standard of conduct to protect others from undue risk. Check out the NSTA's legal implications of duty of care science teaching for further information and guidance on the subject. Be aware that school staff and school district leaders have a duty of care in this situation, which extends outside the classroom or lab to family members who supervise students during these tasks at home or in the field. The activities assigned must not only be in line with the curriculum, but must also promote legal safety standards and better professional safety practices. Regardless of whether the teacher is in place or not, any assigned hands-on activity establishes the teacher's responsibility if someone gets hurt. Teachers have a professional responsibility to provide safety protocols and training as part of the task and must be properly documented in the teacher's plans. The security quiz should also be given and handed over before the student can conduct the experiment. Students and parents must also examine and sign a safety confirmation form before any activities take place inside or outside the STEM science/laboratory. Examples of such documents can be found on the NSTA safety portal page as follows: Primary School Safety Confirmation Form High School Safety Confirmation Form Teachers can use them as models and fine-tune them as necessary, depending on hazards, risks and needs of safety measures for hands-on activities. Please note that these documents must be approved annually by your administration and, in some cases, by the Education Council. If changes are made, they must also be approved by the administration and Education Board. Safety confirmation forms that are used without appropriate consent can potentially also lead to teacher accountability. These are examples of pre-planning safety proposals and recommended safety protocols that students and parents need to be aware of and should follow with safer hands-on activities at home: 1. AAA safety action is required before starting any hands-on work. This includes hazard analysis, risk assessment and safety measures to be taken on the basis of legal safety standards and better professional safety practices. Note that there are three types of hazards to consider: biological (bacteria, virus, etc.), chemicals (toxins, flammable substances, corrosive substances, etc.) and physical (sharp objects, impalement, spring/coils, etc.). Safety data sheets (SDs) can be a useful resource for identifying many hazards associated with chemicals. 2. Chemicals required outside the formal laboratory should only include common but safer household products. These should have a relatively low security classification on the Safety Data Sheet (SDS). For example, vinegar commonly used on salads has a safety label 2. If suitable personal protective equipment (PPE) is used, such as indirectly ventilated chemical goggles. As part of their duty of care, teachers must provide an SDS as part of the task. Keep in mind that not all households will have the necessary common household needs to perform the laboratory. What may be common to the instructor may not be common to students and their families. Families may not have access to shops where they can buy materials. Some families may not be able to afford to purchase materials for use in the laboratory. The safety data sheets should be examined before indicating the use of any household substances in operation. Information on safety hazards can be found here. For more information on acceptable chemical use, see the Rehab-the-Lab chemical list. Do not allow students or their families to use substitute materials, especially chemicals, without the teacher's consent. Replacing materials can lead to dangerous situations. This can also happen if the student switches tags because different tags have different components. If the student cannot obtain the materials that are needed to conduct the experiment, provide an alternative learning task. Proper cleaning and disposal procedures should be carried out in order to maintain the safety of the areas used in laboratory operations. These procedures should be documented as part of the learning activity. 3. Safety data sheets shall be provided to the purchaser in the school district. They are often provided by online commercial companies where chemicals are bought. If it is not available, try searching the Internet for <chemical name=>SDS. Flinn Scientific is also a good link for SDS. 4. Personal disinfectant resources (PPE) are to be provided by schools or parents before </chemical> </chemical> any laboratory assignment with safety considerations. This of course involves hands-on activities outside the formal science/STEM laboratory. Eye protection, such as indirectly ventilated chemical goggles (complying with ANSI/ISEA Standard Z87.1 D3), is to be used when working with liquid hazards (chemicals or biological agents) or protective goggles with side shields using fixed physical hazards (springs, sharp objects, projectiles, etc.) Vinyl or nitrile gloves and non-latex aprons should be used to address biological or chemical risks. If PPE is not available correctly, laboratory exercise or activity must not be carried out. All students and parents involved in laboratory work should be properly trained on how to use, wear and dispose of PPE. The teacher is responsible for ensuring that everyone involved in the laboratory experiment is properly trained. 5. In the case of science/STEM activities involving students in grades K-5 or at basic level, the duty of care shall be provided directly by the responsible adult. 6. In the case of the activities of secondary and secondary school laboratories, teachers should consider the use of simulations where laboratory examinations in schools are not an option. 7. In some cases, a hybrid teaching model or a mixture of traditional classroom teaching and online learning activities may be used. Real hands-on laboratory experiments and collaborative activities should include the focus of face-to-face teaching. This is particularly important when these laboratory exercises and activities require the use of personal protective equipment. The online parts of teaching should then focus on laboratory experience and independent activities in their classroom. 8. In other cases, it may be safer to use teacher demonstrations, either on a personal basis or through a virtual platform. It is very important to report that these demonstrations should not be carried out outside the formal laboratory setting according to specific safety protocols, such as the use of appropriate personal protective equipment 9. Although, according to safety protocols, the operation may be safer, it may not be completely safe. Accidents can still happen. This is especially true when teaching remotely. In this case, as in all others, absolute caution must be exercised by a reasonable and responsible adult who oversees such activities outside the school. At school, it's the teacher's direct responsibility. Remember that the teacher's responsibility for safety still applies when students perform hands-on activities at home or in the field. In addition to the safety protocols contained in the NSTA Safety Acknowledgement forms, a number of additional resources are available on the Internet, which recognise the basic safety instructions for the safety of domestic laboratories. A prime example is the home laboratory safety guidelines developed by the Centre for Science at Athabasca University, AB T9S 3A3 Canada, you can find here. These are usable and a great resource for and home supervisors follow suit for safer domestic scientific activity experiences. The site first states the importance of thoroughly reading laboratory activity guidelines before starting a laboratory. This is not only for a better understanding of the purpose of the activity, but also for awareness of the potential security risks. Below are some specific examples of home lab safety guidelines that can be found on their websites related to personal safety and equipment. Personal safety and equipment • Keep the Home Lab Kit and additional materials away from home safely. • Always use approved eye protection for laboratory activities. • Limit long hair when doing your laboratory activities. • Does not conduct any unauthorized experiments. • Choose a safe place for laboratory activities in your home that is well ventilated and protected from spills, children and pets. Use a work area like your kitchen, where there is a flat and stable work surface, and access to water and various supplies. • Do not drink any food or drink in the laboratory area. • Never put any tool or materials in your mouth. • Wash your hands for a snack or meal before taking a break. • In case of spillage, use suitable foot covers; i.e. no open-leg sandals, bare feet, etc. Chemicals • Keep all chemicals and equipment out of the reach of children and pets. • If possible, keep all unauthorised persons away from your chosen location when chemicals are used to avoid unforeseen accidents. If someone can follow you or participate in experiments, follow all the correct safety rules. • Never wear contact lenses when working with chemicals. • Work with the (small) quantities listed. Follow the instructions to prevent fires, burns and cuts. • Do not smoke or eat if you are using flammable or toxic materials. • Clearly mark all materials and make accurate observations and measurements so that you do not make mistakes or repeat experiments. • Make sure that the area you are working in is well ventilated. Spillage and cleaning • In case of dry spillage, thoroughly clean with paper towels and dispose of chemicals out of the reach of children and pets. • If chemical stains occur on people or clothing, rinse thoroughly with plenty of running water and seek medical advice if necessary. • After working in laboratories, thoroughly clean the place in the laboratory and all dishes used. Emergency situations • In the work area, err on the following emergency equipment: fire extinguisher, water, first aid kit and telephone. Again, remember that the necessary safety instructions depend on the types of hazards and the resulting risks associated with the operation. Although the samples provided at the Center for Science at Athabasca University, Athabasca, are very good, they may not be complete for all types of domestic activities. This information should be be useful for teachers, students and parents/guardians in planning safer home science/STEM activities tasks. Please note the content of this commentary is based on prudent professional safety practices (e.g. Intended to provide basic guidance on the health and safety of employees and students. Therefore, it cannot be assumed that all the necessary warning and precautionary measures are contained in this information. Users of this information should also consult the relevant safety policies of the School Board; local, state and federal laws; and legal representative for other components of the safety prevention programme in these challenging times of the COVID-19 pandemic. Additional resources of the National

Association for the Teaching of Natural Sciences. 2020. Legal consequences of the duty of care to teach science. Recommendations for the At Home Safety Protocols section were adapted from resources provided by Dr. Anne Peterson, Science Coordinator, Virginia Department of Education. Reopening Guidelines: Next Generation Science Standards and Science Instruction at Grades K-12 Delaware's Science Standards Submit regarding safety issues to Ken Roy at safersci@gmail.com or leave him a comment below. Follow Ken Roy on Twitter: @drroysafersci. Security Blog Confirmation. NSTA Chief Safety Blogger Dr. Ken Roy wishes to sincerely thank nationally recognized District Head of Science Kevin S. Doyle, EdD, Morris Hills Regional High School District, Rockaway, New Jersey (kdoyle@mhrd.org) for his expert evaluation of this comment. Comment.