Safety Goggles: Choosing the Right Safety Goggle

Wearing safety goggles is a requirement for many science activities, especially those involving chemicals. Providing students with clean, comfortable, well-fitting safety goggles that are appropriate for the activity is essential to maintaining student safety. Unfortunately, student safety goggles are often:

- Scratched
- Fitted with bands that are no longer elastic
- Non-vented or missing vents
- Broken, with plexiglass fronts that no longer are seated in the frame
- Dirty

This post provides an introduction to purchasing and maintaining appropriate safety goggles for your students.

Choose the Right Goggle: The legislation in Ontario does **not** require that they be CSA approved for either students or teachers. That decision is left up to the employer. It is recommended that they be purchased from a reputable supplier and be stamped with an applicable standard. All new goggle purchases should have indirect venting, an anti-fog coating, and be rated for liquid splash. Goggles with indirect venting have channels that are not aligned, allowing air to freely pass, but preventing liquid from entering the goggle. These are acceptable for wet chemistry activities.

Standards: The UN has attempted to harmonize the many national standards into an international standard to facilitate trade. As would be expected, there is some resistance to this by many standard associations. Until these standards have been universally accepted, most safety goggles are stamped with one of the following codes, depending on the country of origin:

CSA: Z94.3 (Canada) ANSI: Z87.1 (USA, South America) EN: 166 (Europe, Middle East, Central Africa) AS/NZS: 1337.1 (Australia/New Zealand) JIS: (Japan) EAC: 230.1 (Russia) GB: (China)

Best Practice: Contact your supplier and ask for safety goggles that are rated for liquid splash, have indirect venting to allow for adequate air flow, and an anti-fog coating.

Examine the Goggles Annually: Just before the summer, examine the goggles and replace broken, scratched ones. Replace worn, knotted or tired elastic bands to ensure a good fit.

Washing Instructions: As a necessary lab skill, teach students how to wash goggles before wearing them. Provide them with these tips, as just-in-time instructions as they prepare to wash the goggles:

1. Rinse the lens with water to remove grit from the lens surface.
2. Use a non-abrasive cloth that the teacher supplies.
3. Wash the goggle lens with water, wiping with one part of the non-abrasive cloth.

4. Use a dry part of the non-abrasive cloth to gently dry the goggle lens.
5. Wipe the frames with a wet paper towel dipped in a dilute soapy solution.

Goggles or Face Shields? If having a chemical in contact with skin is unacceptable, then a full-face shield must be used. As face shields are easily flipped up, goggles must also be worn with the face shield. If having the chemical contact skin is acceptable (not desirable), then goggles with indirect venting and rated for liquid splash are appropriate.

Avoid These Goggles: Applications that require non-vented, gas-tight goggles are rare and would not likely be required in a high school setting. Vented goggles that are not rated for liquid splash are not recommended as they may mistakenly be used for working with liquid chemicals.

Safety in Science Classes: There is a good culture of safety in Ontario high school science departments, as evidenced by the rarity of serious accidents. This does not suggest that we should become complacent. Instead, we should continue this success by maintaining good safety programs. Teachers are now accustomed to working in small quantities (e.g., 10 mL), in the lowest concentration (e.g., 0.1 mol/L) that still allow the reaction to proceed. Wearing safety goggles when working with chemicals and using safety shields (aka explosion shields) in front of demonstrations have become standard lab safety protocols.

Ensure Goggle Compliance: Use clean, non-scratched goggles, with indirect venting and rated for liquid splash. Teach students to wash and care for goggles. Use constant reminders, humour, and engaging approaches to win over students to safety. We hope that the information presented in this blog will help you make informed decisions for your safety plan.

Many thanks to the safety specialists at HexArmor for their information and advice in writing this article. The Ministry of Labour (MOL) and Canadian Centre for Occupational Health and Safety (CCOHS) also provided answers to my many questions.

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