Dissection Safety

Policy and Procedures

Introduction

Dissection is an important part of many biology and life science courses. Properly planned dissection activities with clear learning goals allow students to observe similarities and differences among organisms and improve student understanding of anatomy and physiology. Dissection safety requires knowledge of preservatives and preserved materials, careful attention to safety precautions, availability of required safety equipment and proper tools, instruction of dissection procedures and advance planning for cleanup and disposal.

General Guidelines

The rationale for dissection work should be well thought out and should be available in written form to answer any student or community questions that may arise. Careful and clearly written directions are important for safe and meaningful dissection work. Some schools may require that teachers provide alternative learning activities with full credit for students who do not participate in dissection labs.

Preservatives and Preserved Materials

Preserved specimens should only be purchased from reputable suppliers to ensure that organisms have been obtained in a responsible manner and handled in accordance with appropriate regulations and guidelines. Most specimens are initially fixed in formaldehyde, which chemically cross-links proteins and prevents cellular enzymes from breaking down tissues and organs. Fixation using formaldehyde results in hardening of the tissues and creates more durable specimens. After the fixing process, the formaldehyde is removed and replaced with a safer preservative that contains alcohol or propylene glycol. Flinn Scientific Canada laboratory specimens are packaged to the industry's highest standards and are at least 99.7% free of residual formaldehyde.

With the extremely low levels of preservative in most specimens, odours are reduced, but the expected lifetime of a preserved specimen is also shortened. A certain degree of preservative odour is likely to linger—good ventilation of the laboratory is thus critical to protect the health and well-being of teachers and students engaged in dissection activities. Work with the school administration to ensure that laboratory ventilation is adequate to provide fresh air and to confine any lingering odour to the laboratory rather than to the entire school. Store all preserved materials in locked cabinets or in a locked stockroom to restrict student access. Keep the specimens in their original containers, and inspect all preserved materials before use. Discard any decaying or damaged specimens.

Safety Precautions and Dissection Procedures

- Wear chemical-resistant gloves, chemical-resistant aprons and chemical splash goggles or safety glasses for all dissection activities. Work in a well-ventilated lab only. Open the windows, if possible, and turn on the purge fan if one is available. There should be absolutely no eating, drinking or gum-chewing during dissection activities.
- Specimens that are preserved with Formalternate or another non-formaldehyde substitute do not need to be rinsed prior to dissection.
- Preserved specimens may be injected with dyes to visualize blood vessels and organs. Although injected specimens cost more, the coloured arteries, veins and organs provide helpful reference points for locating hard-to-find organs and help students identify how organs are served by different blood vessels. The injection materials contains latex.
- Inspect dissection tools on a routine basis. Use only quality dissection tools that are sharp and free of rust. Handle scalpels, razor blades and other sharp instruments with care, and do not use excessive force when working with or cleaning sharp instruments. Dull and dirty scissors, scalpels or blades are much more dangerous that sharp, clean ones. Discard any instruments that are damaged and cannot be repaired.
- Instruct students on proper dissection techniques and procedures, including how to safely remove the scalpel cover, how to safely cut with a scalpel and how to dispose of sharps. Always cut away from the body and away from other people. Reposition the specimen or move to ensure safety.

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- Properly mount specimens to the dissection pan or tray. Do not dissect a specimen while holding it. Use dissection scissors whenever possible. Cut gently and avoid using excessive force. Deep cuts are more dangerous and may slice through internal organs. Use bone shears to cut bones, including the rib cage. Dissection pins are used to hold the skin back and improve visibility—they do not hold the specimen to the tray. The specimen may slide during dissection if too much pressure is used.
- Dissection activities may continue longer than one or two lab periods. Specimens may be stored for up to a month if stored properly. Wrap specimens in paper towels wet with Formalternate (or equivalent alternative), double bag and store in a dark, cool, dry place.

Cleanup and Disposal

- Wash hands frequently and before leaving the laboratory. Teach students about the potential for inadvertent contamination when they are working with preserved specimens even while wearing gloves. Once a glove has touched the specimen or instrument, it is contaminated. Avoid unconscious gestures, such as scratching the face and adjusting safety glasses. Sanitize safety glasses as needed.
- Provide adequate time for proper cleanup and disposal of all dissection materials and the lab. Rinse dissection tools and pans after each use. If dissection pans contain rubber inserts, wash them separately. Wash and dry lab tops.
- Drying instruments thoroughly is important to prevent rust—dry sharp items by wiping on paper towels and allow air to circulate around the items until they are completely dry.
- Remove scalpel blades at the end of each dissection unit and carefully dispose of in a sharps container. Clean instruments with Alconox® detergent solution (1 teaspoon Alconox mixed with 1 L water), rinse with water, and dry thoroughly.
- Double-bag specimens, along with gloves and disposable aprons, in opaque garbage bags. Discard in an appropriate, secure container. Local conditions (e.g., septic systems) and regulations will determine the proper procedure for disposal of preserved materials. Teachers and administrators have a responsibility to be fully aware of all state and local regulations governing the disposal of laboratory and biological waste.

Tips

- Be alert and sensitive to the needs of students who may be uneasy during dissection activities.
- Rinsing specimens in water is no longer recommended.
- Flinn offers a full line of dissection guides that were written for maximum comprehension by middle school and high school students. Combined with the *Flinn Dissection Photo Guides*, they provide step-by-step guidance for each body system.