

## Classroom Management in Elementary Science & Technology Workshop Facilitator Notes

Intended Audience: All elementary teachers who teach science and technology.

Time: 1 hr

This module focuses on effective classroom management strategies that are critical if teachers are to provide students with a safe environment for hands-on/minds on learning experiences. The module encourages teachers to adopt best practices to engage the wide range of learners, including those with special education needs, in hands-on/minds-on learning experiences. These practices help to make these experiences more inclusive for all elementary students regardless of their learning needs.

Topics include:

- The importance of classroom management in maintaining safety during hands-on/minds-on learning experiences
- Establishing routines for hands-on/minds-on learning experiences
- Planning safe hands-on/minds-on learning experiences for all elementary students
- Planning for field trips

### Materials Required:

- Classroom Management slide deck

Slide 1	<b>Classroom Management</b>  This workshop introduces suggestions for effective classroom management that are critical if teachers are to provide students with a safe environment for hands-on/ minds-on learning experiences. Good classroom management sets the foundation for safety. This workshop also offers strategies to make hands-on/minds-on learning experiences inclusive for all students, especially those with special education needs.
Slide 2	<b>Learning Goals</b>  These are the learning goals for the workshop. Refer to these periodically during the workshop to ensure the discussion is on track and meeting these goals.

<p>Slide 3</p>	<p><b>Who is STAO?</b></p> <p>This is a summary of STAO and its mandate. The benefits of STAO membership include:</p> <ul style="list-style-type: none"> <li>• high-quality resources, many vetted by S&amp;T and safety knowledgeable teachers,</li> <li>• reduced conference admission and being connected to like-minded educators.</li> </ul> <p>Facilitator: If time permits take participants on a guided tour of the STAO website.</p>
<p>Slide 4</p>	<p><b>Join the STAO team...</b></p> <p>STAO is an organization of teachers helping other teachers. Join and share your passion with others.</p>
<p>Slide 5</p>	<p><b>Accidents in Elementary S&amp;T What Can We Learn?</b></p> <p>OSBIE, or the Ontario School Board Insurance Exchange, is a school-board owned, non-profit insurance company that represents most of the school boards in Ontario.</p> <p>OSBIE receives, collects, pays out and advises school boards about student accidents. Most of the information comes from the student accident reports that you must fill out when a student gets hurt. Some information also comes from investigations conducted by boards and OSBIE itself.</p> <p>Discussion: Share a close call or reportable incident with an elbow partner and then one or two with the larger group. Examples could include hot glue gun burns, slips on wet floors, kids getting wet feet in a creek or pond, kids getting sand or soil bits near their eyes, splinters from popsicle stick cutting, putting castor beans in their mouth, paper cuts.</p>
<p>Slide 6</p>	<p><b>Accidents in Elementary S&amp;T</b></p> <p>These are comments from Davide Beale, former chairperson of OSBIE. It is important for the teacher to have shown “due diligence”: thinking ahead, identifying the hazards and their risk of happening, the protective equipment to reduce the risk and the developmental stage of the kids to handle the activity. The normal test is what would a knowledgeable prudent parent have done?</p>

<p>Slide 7</p>	<p><b>A Useful Metaphor for Science Safety</b></p> <p>The traffic light serves as a useful metaphor when considering the safety of a given task. Identify the hazards and then assess the risks associated with conducting the task with your students. If risk can be kept to an acceptable minimum, proceed and develop your safety plan for the task. This includes how you intend to manage your classroom, e.g., distribution and use of materials and equipment, cleanup, waste disposal, student responsibilities.</p>
<p>Slide 8</p>	<p><b>Good Classroom Management</b></p> <p>These are important considerations when planning tasks. Can you think of others? These considerations complement each other, forming a foundation upon which safe and engaging tasks can be conducted. The required emphasis on these considerations depends on several factors including the age and maturity of your students and the physical layout of your room. Room considerations include access to water, electricity, natural and artificial light, an enclosed courtyard or fenced off naturalized area, various Information technologies, tools and materials and perhaps even volunteers and EAs, and the amount of time available are amongst some of the many factors.</p>
<p>Slide 9</p>	<p><b>The Importance of Good Classroom Management</b></p> <p>When students know and understand the expectations and routines of the classroom, they are more likely to successfully complete the investigation. They are also more likely to collaborate and become more engaged in their learning.</p> <p><b>Facilitator:</b></p> <p>Provide examples from your own experience and that of participants to illustrate these points. For example, increased engagement might be a result of an engaging introductory “hook” or demo or providing students with opportunities to choose and plan how to use some of the classroom resources to conduct an investigation to try and answer a question. By dividing the class into smaller groups. Providing them with more variety of stations, but not having to complete all stations to ensure maximum participation.</p>

Slide  
10

## **Classroom Organization**

This slide supplies important materials and equipment considerations when conducting investigations. How do these considerations apply to your classroom?

What other considerations come to mind?

Other more specific considerations include:

- Safety goggles should be stored so they stay organized and free of scratches. If goggles are shared, a process for cleaning goggles between uses should be established.
- Avoid using glassware if possible. If glassware is used, consider strategies that minimize the risk of breakage. Furthermore, have a process in place to clean up broken glass. Bringing glassware from home like baby food jars is not recommended because of the risk of breakage. Unbreakable plastic cups are often a suitable for most tasks involving water or water-based mixtures.
- Dollar store/kitchen-style equipment should always be assessed for safety before being used by students.
- Hand tools must be properly maintained and stored for safe use.
- Have extra material on hand. To minimize spills and contamination, subdivide materials into smaller containers. Keep large stock containers in secure storage.
- Designate student work areas so that sight lines are maintained throughout the investigation. You should be able to see what each student is doing throughout the investigation.
- Insist on good housekeeping (e.g., keep the room free of debris and slip or trip hazards).

### **Facilitator:**

Suggested group discussion items include:

1. Ask small groups of participants to take one of these slide points and illustrate a best practice, e.g.,

- Layout the materials to keep student traffic to a minimum
- Try to avoid students working with their backs to you
- Declutter storage areas so that space is available to store student investigations that continue over several days.
- Prior to an investigation do a pre-check for excess materials and cords which may be spill or trip hazards.

Other discussion items might include:

- What are some of the hazards you see or know about? Then ask how you remove the hazard from the activity, OR, if you can't remove the hazard, how do you protect the students and yourself? Goggles, aprons, gloves, sunglasses are all PPEs that cost

	<p>money but let you safely do activities that may be hazardous. Discuss how to get them, when to use PPEs, how and when to share and keep clean, and how to make sure they protect and not make things more unsafe and finally ideas on how to store PPE's effectively.</p> <ul style="list-style-type: none"> <li>• Do you have a system to identify, tag, remove or fix broken hand tools or equipment? If not, develop a system that includes students reporting to the teacher if participants don't already have one.</li> </ul>
<p>Slide 11</p>	<p><b>Room Set-Up</b></p> <p>How is your room set-up? What features do you have? What barriers do you face? How do you overcome these?</p> <p><b>Facilitator:</b></p> <p>If the workshop is being conducted in a classroom, ask participants to assess the room set-up for investigations. Ask participants how they might arrange students and distribute materials? Be prepared to have concrete suggestions for classrooms that have round tables and chairs which have its own challenges than desks that are grouped and can be moved around. Also, moving furniture and then returning it to its original configuration is a classroom management and safety issue if done with and by the students.</p>
<p>Slide 12</p>	<p><b>Storage Options</b></p> <p>This slide provides strategies for the efficient storage and access to equipment. Ensure that your storage of materials and equipment practices reinforce your classroom routines and expectations?</p> <p>Specific details include:</p> <ul style="list-style-type: none"> <li>• Labelled cupboards allow students to take ownership of accessing and returning equipment and materials.</li> <li>• Rolling carts allow materials to be accessible when and where they are needed.</li> <li>• Consider what should be kept in the separate storage room (e.g., rolling carts, larger items in bulk like Lego kits, items that students should not have access daily).</li> <li>• Some boards have specific labelling requirements for common substances like baking soda, oil, salt etc., such as 'Not for Human Consumption'; date of purchase and when opened. These materials should be kept under lock and key with their SDS sheets readily available. Always check with your board for specific requirements.</li> </ul>

<p>Slide 13</p>	<p><b>Setting Routines</b></p> <p>Student investigations are more likely to be successful and safe when students know and understand the expectations and routines of the classroom. Clear routines also allow students to recognize when something is not as it should be and that might require a teacher’s attention. Routines should be consistent and age appropriate.</p> <p>What are some effective and engaging ways in which you establish routines at the beginning of the year? Please note that important tasks are established at the beginning of the year, but it may be more appropriate to be set later. For example, routines for hands-on/minds-on science and technology activities should be reviewed on a consistent basis throughout the year.</p> <p><b>Facilitator:</b></p> <p>Provide some practical examples from your experience to illustrate these points.</p>
<p>Slide 14</p>	<p><b>General Routines</b></p> <p>This slide outlines five general routine considerations. These considerations, together with student safety training contribute to a culture of safety mindedness in your classroom. More specific considerations include:</p> <ul style="list-style-type: none"><li>• Do students require permission to enter?</li><li>• Where do they sit?</li><li>• Are they allowed to touch materials and equipment if these items are in the room?</li><li>• Do you have flexible seating options available for investigations? If so, how are they implemented?</li><li>• Are students allowed in all cabinets and do they know where to get materials?</li><li>• Are students allowed to form their own groups? Consider random and purposely formed groups so students can collaborate with a variety of peers that have different strengths and needs. Vary the roles of the students when working in groups.</li></ul>

Slide 15	<p><b>Planning for All Students</b></p> <p>This slide summarises strategies that help ensure all tasks are both safe and inclusive of all students.</p> <p>Some students may require specific accommodations as outlined in their IEP. Others, like ELL students may require language support like clear and simple safety posters when learning safety procedures. Many other students would benefit from these posters as well. Consider using interpreters with help with language barriers.</p> <p>Please take a moment to share an accommodation that you found particularly useful. What are your most significant challenges/concerns when attempting to make your tasks totally inclusive?</p> <p><b>Facilitator:</b></p> <p>Provide some practical examples from your experience to illustrate these points, e.g., students with attention deficits, shyness, safety language and ELL students.</p>
Slide 16	<p><b>Do Science and Technology</b></p> <p>Investigations are engaging for students and help make concepts come alive and relevant to students. It also provides opportunities to use materials and equipment that they might not have otherwise and provides opportunities for inquiry, creativity and the development of new skills. Teaching technology provides opportunities for students to explore different methods of problem-solving and creativity.</p> <p>Adapt, as needed to the varying abilities of your students. For example, one group might require significant accommodations and alterations in the procedure while another may not. Supply teachers should not be left with tasks that involve tools (unless properly trained as per board policy) or in-depth investigations that require more materials and equipment than “normal”.</p> <p>What engaging investigations have you tried? Why were they effective? Please share your experiences in a small group or with everyone.</p>

<p>Slide 17</p>	<p><b>Doing Science and Technology</b></p> <p>This slide summarises some important considerations when selecting and conducting investigations.</p> <p>Other useful advice includes:</p> <ul style="list-style-type: none"> <li>• Don't assume students will remember skills and precautions from previous years (or even the day before!). Review all safety concerns and procedures.</li> <li>• Ensure all required personal protective equipment (PPE) is available.</li> <li>• Model key steps and demonstrate different skills (e.g., how to put a coverslip on a microscope slide, how to start a cut with a handsaw).</li> <li>• Post anchor charts or have clear handouts in the room highlighting different steps, skills or safety reminders.</li> <li>• Make sure all students are aware and understand (e.g., safety tests before using hand and power tools).</li> <li>• Make how-to videos of skills or instructions so students can go back and watch them when needed.</li> <li>• Consider ways to incorporate educational technologies into your investigations (e.g., videos - time lapses, slowing down quick reactions, simulations, timers, products and demonstration of knowledge).</li> </ul>
<p>Slide 18</p>	<p><b>Planning a Field Trip</b></p> <p>This slide summarises some of the many planning considerations when planning a field trip. Always consult with local school and board policies and procedures regarding trips, including the necessary approvals</p> <p><b>Facilitator:</b> Ask participants to share their favourite trip locations and why they are advantageous to learning. They may also wish to share logistical challenges in organizing trips in this particular school or board.</p>
<p>Slide 19</p>	<p><b>Planning a Field Trip – Site Preview</b></p> <p>Assess the field trip site before taking students there. This will help you plan a course of action to consider foreseeable hazards like</p> <ul style="list-style-type: none"> <li>• Plant and Animal hazards, e.g., biting or stinging insects, poison ivy</li> <li>• Location hazards, e.g., uneven or slippery ground; traffic, poor sightlines, steep or slippery slopes</li> <li>• Weather hazards, e.g., sunburn; heat stress; hypothermia</li> </ul> <p>According to STAO's 'Safety in Elementary Science and Technology', the best way for mitigating risk is introduce outdoor learning over time. Through numerous experiences, students can get to know what is expected of them and to behave during outdoor lessons. These "trips" can start with something as simple and safe as going into the school yard.</p>

Slide 20	<p><b>Field Trip Day – Slide 1</b></p> <p>This slide summarises a few of the many considerations required to make the trip a success. Grouping students with a designated adult supervisor is particularly important.</p>
Slide 21	<p><b>Field Trip Day – Slide 2</b></p> <p>This slide provides additional suggestions to maximize the learning experience of the field trip for your students.</p>
Slide 22	<p><b>Field Trip Day – Slide 3</b></p> <p>This slide provides additional suggestions. Nature studies are a good opportunity to model environmental stewardship.</p>
Slide 23	<p><b>Wrapping Up</b></p> <p>This slide reviews the importance of investigations and the value in networking with subject associations and colleagues.</p> <p>The following questions are useful for small group discussions to conclude this workshop:</p> <ul style="list-style-type: none"><li>• What are the benefits of conducting investigations with your students? What are the challenges?</li><li>• What strategies have you found effective to alter investigations to ensure they are safe for all students?</li><li>• What are some other resources and learning opportunities that you have found useful?</li></ul>