



## Board/Authority Authorized Course Framework Template

<b>School District/Independent School Authority Name:</b> Abbotsford School District	<b>School District/Independent School Authority Number (e.g. SD43, Authority #432):</b> SD34
<b>Developed by:</b> Cheri Smith	<b>Date Developed:</b> October 3, 2018
<b>School Name:</b> Yale Secondary	<b>Principal's Name:</b> Jinder Sarowa
<b>Superintendent Approval Date (for School Districts only):</b> Dec. 5, 2018	<b>Superintendent Signature (for School Districts only):</b>
<b>Board/Authority Approval Date:</b> Nov. 6, 2018	<b>Board/Authority Chair Signature:</b>
<b>Course Name:</b> BAA Lab Tech Assistant 12	<b>Grade Level of Course:</b> 12
<b>Number of Course Credits:</b> 4	<b>Number of Hours of Instruction:</b> 120
<b>Course Code:</b> YED-2B	

### Board/Authority Prerequisite(s):

Applicants must be enrolled in/or have completed one or more senior science courses, including Chemistry 11 or Physics 11 and have achieved at a B or higher standing in all of their highest level science and math courses. A basic understanding of computer programs is essential. In addition, student selections are at the discretion of the science department.

**Special Training, Facilities or Equipment Required:**

Students in this course should be supervised by a science teacher or a qualified adult lab technician at all times. Students may work with the qualified adult technician, but assessment must ultimately be carried out by the science teacher.

**Course Synopsis:**

This course is intended for senior students with a strong science background. It is intended to benefit those who intend to pursue post secondary studies in science based fields. This is a laboratory course which will expand upon, or be done in conjunction with, some of the basic laboratory work that was done in grade 11. Students will receive an orientation session that introduces them to the lab environment, their job description and expectations prior to starting their experience. Students are involved in the preparation of laboratory material, including solutions, chemical supplies and equipment. In addition, they will be trained in the working procedures of laboratory preparations, including stock accountability (receiving, ordering, and inventory), applied mathematics, safety, daily procedures, and laboratory organization. Finally, a teaching aspect is added to the laboratory technician course as the student will assist junior students who are attempting laboratory work as part of their Honours project. This course integrates applied mathematics (dimensional analysis) with science in the preparation of various chemicals and physics experiments. A small portion of this course ( $\leq 20\%$ ) can be in a peer tutoring role. This role, however, is specific to experimentation, often occurring in the lab itself as students work through specific activities. In this way, it does not significantly overlap the Peer Tutoring 11 and Peer Tutoring 12 courses.

**Goals and Rationale:**

1. To expose students to laboratory technician related skills to increase their employability.
2. To demonstrate communication and instructional skills when working with others in a science-related environment.
3. To develop the characteristics and habits of a successful laboratory technician in the workplace.
4. To become WHMIS certified and learn the WHMIS requirements for safely handling, preparing and storing chemicals and equipment.
5. To become familiar with the skills required to prepare and organize chemicals required in a high school science laboratory.
6. To practice the technological skills and computer applications used by a technician in a laboratory.
7. To participate in the delivery of science learning standards and constructive feedback in the role of tutorial assistants.

There is a demand for this type of course among those who are highly focussed in the science area. This course emulates the professional experience a lab technician requires and provides students with job related transferable skills.

**Aboriginal Worldviews and Perspectives:**

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. The use and disposal of chemicals must be done in as “green” a manner as possible (potentially hazardous materials should be disposed of in a way that will minimize harm to us and our environment).
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). This course provides students with practical, hands-on experience and an opportunity to reflect on their learning and improve their employability skills.
- Learning involves recognizing the consequences of one’s actions. Students will act as role models for professional behaviour understanding that the impact of their actions on others.

- Learning involves patience and time. As students apply the Scientific Method throughout this course, they come to understand that solutions do not come easily or fast. Patience and time lead to a better quality experience and product.
  - Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations. The identity of “unknowns” in qualitative and quantitative analysis experiments should be valued and guarded by the student lab technician.
-

**BIG IDEAS**

Lifelong learning and active citizenship foster career-life opportunities for people and communities.

Scientific knowledge can be used to develop procedures, techniques, and technologies that have implications for places of employment.

Scientific processes and knowledge inform our decisions and impact our daily lives.

**Learning Standards**

Curricular Competencies	Content
<p><i>Students are expected to do the following:</i></p> <ul style="list-style-type: none"> <li>● Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data</li> <li>● <b>Plan and implement ways to prepare chemicals</b></li> <li>● <b>Create and implement a plan for the safe handling of equipment</b></li> <li>● Connect scientific explorations to careers in science</li> <li>● Assess risks in the context of personal safety and social responsibility</li> <li>● Apply the concepts of accuracy and precision to experimental procedures and data:                         <ul style="list-style-type: none"> <li>○ significant figures</li> <li>○ uncertainty</li> <li>○ scientific notation</li> </ul> </li> <li>● Explore possibilities for using creative and innovative thinking during their lab tech experience</li> <li>● Identify and apply preferred approaches to learning for ongoing career-life development and self-advocacy</li> <li>● Engage in, reflect on, and evaluate career-life exploration via their practical experience</li> <li>● Collaborate with supervising teacher to inform career-life development and exploration</li> <li>● Demonstrate and reflect on inclusive, respectful, and safe interactions within the classroom or lab</li> <li>● Plan different and appropriate ways to offer <b>assistance</b> to others</li> <li>● Demonstrate appropriate <b>professional standards</b></li> </ul>	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> <li>● <b>WHMIS guidelines/standards</b></li> <li>● equipment usage</li> <li>● measuring techniques and strategies</li> <li>● labelling techniques</li> <li>● material storage strategies</li> <li>● material disposal procedures</li> <li>● cost analysis</li> <li>● <b>employability skills</b></li> <li>● <b>safety protocols</b></li> <li>● <b>rights and regulations in the workplace, including safety</b></li> <li>● professional standards</li> <li>● <b>peer tutoring/mentoring techniques</b></li> </ul>

- Apply safety procedures for themselves, co-workers, and users in both physical and digital environments
- Explore existing, new, and emerging tools, technologies, and systems

### Big Ideas – Elaborations

### Curricular Competencies – Elaborations

- **Plan and implement ways to prepare chemicals-** calculate appropriate masses and volumes to prepare solutions of a particular concentration, prepare solutions for use in the laboratory, refill reagent containers used to dispense chemicals in the lab, maintain a clean and hazard free preparation area, maintain an accurate inventory of laboratory stock items and assist in ordering and receiving stock from supply companies
- **Create and implement a plan for the safe handling of equipment-** including hardware and glassware. Prepare equipment for prescribed experiment, perform minor repairs on damaged equipment, maintain proper equipment storage, track any missing or damaged equipment on the lab inventory
- **assistance-** understanding that there are different ways to tutor and interact with peers. Approaches include demonstration, modelling, guiding or prompting questions, verbal and reflective feedback, showing an alternative method or approach, but not taking over for the student.
- **professional standards-** including dress, hygiene, and personal protective gear, methods of speaking (ie. no swearing or inappropriate comments)

### Content – Elaborations

- **WHMIS guidelines-** as appropriate to the lab course and includes certification training
- **employability skills-** prioritizing, managing time, punctuality, taking initiative, being motivated, good communication and interpersonal skills, reliability, leadership, and interacting with supervising teacher and other students
- **safety protocols-**including proper use of personal protective equipment and WHMIS protocols when working in the lab environment
- **rights and regulations in the workplace, including safety-** including workplace safety protocols as provided by worksafebc
- **peer tutoring/mentoring techniques-** assisting other students with comprehension of content, assembling and proper use of equipment, interpretation of data and observations collected during lab work

### Recommended Instructional Components:

- **Direct instruction-**tour of the preparation area, stockroom, storage area including proper and safe use of volumetric glassware, the electronic balance, distillation apparatus, and other measuring devices, maintenance and calibration of equipment
- **Written instructions, independent work-**students are provided with lists of materials that are required to be prepared for on-going labs. Students are required to implement instructions during the preparation of the materials
- **Modelling-** the safe and proper use of equipment and procedures
- **Group work-** students assist others in a group during peer tutoring and mentoring opportunities

- **Computer Use**-students create practice assessments following models provided by the teacher, access catalogues and other supplier sites to price and order materials, use computer software to operate probeware
- **Feedback opportunities**- Feedback is given on performance with opportunities to reflect on how to improve or change performance

**Recommended Assessment Components: Ensure alignment with the [Principles of Quality Assessment](#)**

- There will be no final examination.
- Formative assessment is ongoing via informal feedback and discussion. There are opportunities for daily feedback. Students complete self-evaluations on an on-going basis. These are reviewed and used as points of discussion between the classroom teacher and the student. Adjustments are made on an ongoing basis.
- Self-assessment is ongoing using the Employability Skills Profile from the Conference Board of Canada as a guideline:
- <https://www.conferenceboard.ca/docs/default-source/educ-public/esp2000.pdf?sfvrsn=0>
- Summative assessment comes as a culmination of observations, feedback and student self-assessment. (See attached performance evaluation form.)

**Learning Resources:**

- BC Science Safety Manual
- WHMIS Binder
- Subject specific textbooks and resources
- WorksafeBC
- Materials supply websites and catalogues
- Computer software (probeware)

## Lab Tech Assistant Self-Evaluation

Student Name \_\_\_\_\_

Block \_\_\_\_\_

Course \_\_\_\_\_

Supervising Teacher \_\_\_\_\_

Please evaluate yourself on the following aspects of this course:

Aspect	Success Criteria	Emerging	Developing	Proficient	Extending	Comments
<b>Workplace Behaviours</b> -Demonstrates appropriate professional standards -Explore possibilities for using creative and innovative thinking during their lab tech experience	Demonstrates punctuality					
	Displays a good work ethic					
	Demonstrates reliability					
	Demonstrates initiative					
	Demonstrates ability to prioritize tasks and manage time effectively					
<b>Interpersonal Skills</b> -Demonstrate and reflect on inclusive, respectful and safe interactions within the lab or classroom -Collaborate with supervising teacher to inform career-life development and exploration	Interacts well with teachers					
	Interacts well with other students					
<b>Handling of Materials</b> - Assess risks in the context of personal safety and social responsibility	Uses appropriate handling methods					
	Maintains proper labeling					
	Maintains proper material storage					
	Applied proper disposal procedures					
	Maintains a clean and hazard-free preparation area					

## Lab Tech Assistant Self-Evaluation

<b>Preparation of Chemicals</b> -Plan and implement ways to prepare chemicals -Use appropriate SI units -Apply concepts of accuracy and precision to experimental procedures and data	Accurately calculates measurements for solution preparation					
	Can follow proper procedure for preparing solutions					
	Maintains reagent containers used to dispense chemicals					
<b>Handling of Equipment</b> - Use appropriate equipment - Apply safety procedures for themselves, co-workers, and users in both physical and digital environments -Create and implement a plan for the safe handling of equipment	Prepares equipment properly and safely					
	Performs minor repairs on damaged equipment					
	Maintains proper equipment storage					
	Tracks any missing or damaged equipment					
<b>Data Entry</b> -Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data	Assists in ordering and receiving stock					
<b>General Computer Use</b> - Explore existing, new, and emerging tools, technologies, and systems	Searches for appropriate design ideas and industry standards					
	Safely uses technology					
	Sources materials from appropriate suppliers					
<b>Peer Tutoring/ Mentoring</b> -Demonstrate and reflect on inclusive, respectful, and safe interactions within the classroom or lab -Plan different and appropriate ways to offer assistance to others	Assists other students with comprehension of content, methods, techniques, and procedures					
	Assists other students with safe and proper use of equipment and procedures					



## Lab Tech Assistant Performance Evaluation-Teacher to complete

Student Name \_\_\_\_\_

Block \_\_\_\_\_

Course \_\_\_\_\_

Supervising Teacher \_\_\_\_\_

Please evaluate yourself on the following aspects of this course:

Aspect	Success Criteria	Emerging	Developing	Proficient	Extending	Comments
<b>Workplace Behaviours</b> -Demonstrates appropriate professional standards -Explore possibilities for using creative and innovative thinking during their lab tech experience	Demonstrates punctuality					
	Displays a good work ethic					
	Demonstrates reliability					
	Demonstrates initiative					
	Demonstrates ability to prioritize tasks and manage time effectively					
<b>Interpersonal Skills</b> -Demonstrate and reflect on inclusive, respectful and safe interactions within the lab or classroom -Collaborate with supervising teacher to inform career-life development and exploration	Interacts well with teachers					
	Interacts well with other students					
<b>Handling of Materials</b> - Assess risks in the context of personal safety and social responsibility	Uses appropriate handling methods					
	Maintains proper labeling					
	Maintains proper material storage					
	Applied proper disposal procedures					
	Maintains a clean and hazard-free preparation area					

## Lab Tech Assistant Performance Evaluation-Teacher to complete

<b>Preparation of Chemicals</b> -Plan and implement ways to prepare chemicals -Use appropriate SI units -Apply concepts of accuracy and precision to experimental procedures and data	Accurately calculates measurements for solution preparation					
	Can follow proper procedure for preparing solutions					
	Maintains reagent containers used to dispense chemicals					
<b>Handling of Equipment</b> - Use appropriate equipment - Apply safety procedures for themselves, co-workers, and users in both physical and digital environments -Create and implement a plan for the safe handling of equipment	Prepares equipment properly and safely					
	Performs minor repairs on damaged equipment					
	Maintains proper equipment storage					
	Tracks any missing or damaged equipment					
<b>Data Entry</b> -Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data	Assists in ordering and receiving stock					
<b>General Computer Use</b> - Explore existing, new, and emerging tools, technologies, and systems	Searches for appropriate design ideas and industry standards					
	Safely uses technology					
	Sources materials from appropriate suppliers					
<b>Peer Tutoring/ Mentoring</b> -Demonstrate and reflect on inclusive, respectful, and safe interactions within the classroom or lab -Plan different and appropriate ways to offer assistance to others	Assists other students with comprehension of content, methods, techniques, and procedures					
	Assists other students with safe and proper use of equipment and procedures					

## Lab Tech Assistant Self-Evaluation

Student Name \_\_\_\_\_

Block \_\_\_\_\_

Course \_\_\_\_\_

Supervising Teacher \_\_\_\_\_

Please evaluate yourself on the following aspects of this course:

Aspect	Success Criteria	Emerging	Developing	Proficient	Extending	Comments
<b>Workplace Behaviours</b> -Demonstrates appropriate professional standards -Explore possibilities for using creative and innovative thinking during their lab tech experience	Demonstrates punctuality					
	Displays a good work ethic					
	Demonstrates reliability					
	Demonstrates initiative					
	Demonstrates ability to prioritize tasks and manage time effectively					
<b>Interpersonal Skills</b> -Demonstrate and reflect on inclusive, respectful and safe interactions within the lab or classroom -Collaborate with supervising teacher to inform career-life development and exploration	Interacts well with teachers					
	Interacts well with other students					
<b>Handling of Materials</b> - Assess risks in the context of personal safety and social responsibility	Uses appropriate handling methods					
	Maintains proper labeling					
	Maintains proper material storage					
	Applied proper disposal procedures					
	Maintains a clean and hazard-free preparation area					

## Lab Tech Assistant Self-Evaluation

<b>Preparation of Chemicals</b> -Plan and implement ways to prepare chemicals -Use appropriate SI units -Apply concepts of accuracy and precision to experimental procedures and data	Accurately calculates measurements for solution preparation					
	Can follow proper procedure for preparing solutions					
	Maintains reagent containers used to dispense chemicals					
<b>Handling of Equipment</b> - Use appropriate equipment - Apply safety procedures for themselves, co-workers, and users in both physical and digital environments -Create and implement a plan for the safe handling of equipment	Prepares equipment properly and safely					
	Performs minor repairs on damaged equipment					
	Maintains proper equipment storage					
	Tracks any missing or damaged equipment					
<b>Data Entry</b> -Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data	Assists in ordering and receiving stock					
<b>General Computer Use</b> - Explore existing, new, and emerging tools, technologies, and systems	Searches for appropriate design ideas and industry standards					
	Safely uses technology					
	Sources materials from appropriate suppliers					
<b>Peer Tutoring/ Mentoring</b> -Demonstrate and reflect on inclusive, respectful, and safe interactions within the classroom or lab -Plan different and appropriate ways to offer assistance to others	Assists other students with comprehension of content, methods, techniques, and procedures					
	Assists other students with safe and proper use of equipment and procedures					