

# **Science, Level IV (Graduate)**

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# Introduction

## The Changing Context of Adult Education

Adults who return to formal learning are likely entering a different world of education than they previously experienced. Many adult learners juggle multiple responsibilities related to parenting, employment, and community involvement.

As globalization makes world markets more accessible, workplace demographics and the scope of business are changing. New, affordable tools must be factored into adult education to create a skilled workforce that can compete in these global markets.

Adult education must respond to these challenges by providing successful learning environments. Today's workers are expected to have knowledge and skills that were unimagined a few decades ago. Nova Scotians are called upon to solve more problems, make more connections, think more critically and creatively, and communicate in more ways than ever. To meet these demands, workers must embrace lifelong learning.

## Essential Skill Requirement for the Workplace

There is evident pressure for adults to achieve a high school graduation diploma. Nova Scotian employers expect a high school education from people applying for most entry-level jobs. Entrance into skilled trades and technologies (as well as entry-level workplace training programs) usually require a high school diploma. Newly created jobs may even require post-secondary education.

## Educational Research

The fields of education, psychology, and sociology are exploding with research. Quality curriculum development needs to be grounded upon substantive results from these studies. This document integrates key research findings that help form the foundation for outcomes, learning activities, and the assessment suggestions provided in adult learning programs.

## Nova Scotia's Response: NSSAL/ALP

The Nova Scotia School for Adult Learning (NSSAL) coordinates and supports the delivery of adult education programs. It was created in response to global, national, and provincial issues and helps adults to prepare for life and work in the 21st century.

The Department of Labour and Workforce Development provides funding and coordinates the activities of three types of delivery partners: community-based programs, the Nova Scotia Community College, and Adult High Schools. This funding supports tuition-free programs for Nova Scotian adults. Two of these delivery partners, community-based programs and community colleges, develop programs based on the Adult Learning Program (ALP), which is flexible in delivery and recognizes a variety of credits. The Department of Labour and Workforce Development develops this curriculum in partnership with the Public School branch of the Department of Education and (when appropriate) with employers and labour market specialists. Information about the ALP can be found through the Nova Scotia School for Adult Learning website (<http://gonssal.ca>).

## Five Crosscutting Themes of the Adult Learning Program (ALP)

NSSAL partners have discovered five crosscutting themes—themes that apply across the curriculum—that affect learner success. These themes have been applied to all aspects of curriculum planning and program delivery. They include employability, literacy, numeracy, technology, and inclusivity.

<p><b>Employability</b></p>	<p>ALP learners are in transition. Their return to learning provides an opportunity to improve their skills and better their credentials. When learners can make the link between classroom learning and the real world, they usually respond with increased motivation.</p> <p>Instructors can enhance these connections by helping learners recognize links between past experiences, natural abilities, genuine interests, and the realities of their lives. By the end of every ALP course, learners should be able to connect skills they learned in the classroom with skills they need to find work. They should have a repertoire of employment-related resources for independent use and should understand the meaning of employability skills</p> <p>To understand what employers are looking for, the Adult Learning Program uses as a benchmark The Conference Board of Canada’s Employability Skills (<a href="http://www.conferenceboard.ca/education/learning-tools/pdfs/esp2000.pdf">www.conferenceboard.ca/education/learning-tools/pdfs/esp2000.pdf</a>). These include the Essential Skills as defined by Human Resources and Social Development Canada and are considered necessary to enter, stay in, and progress in the world of work, either independently or as part of a team. They are presented with the permission of The Conference Board of Canada in three sections: Fundamental Skills, Personal Management Skills, and Teamwork Skills on the following page.</p>
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## Employability Skills 2000+

**The skills you need to enter, stay in, and progress in the world of work—whether you work on your own or as a part of a team.**

These skills can also be applied and used beyond the workplace in a range of daily activities.

### Fundamental Skills

The skills needed as a base for further development

*You will be better prepared to progress in the world of work when you can:*

#### Communicate

- read and understand information presented in a variety of forms (e.g., words, graphs, charts, diagrams)
- write and speak so others pay attention and understand
- listen and ask questions to understand and appreciate the points of view of others
- share information using a range of information and communications technologies (e.g., voice, e-mail, computers)
- use relevant scientific, technological and mathematical knowledge and skills to explain or clarify ideas

#### Manage Information

- locate, gather and organize information using appropriate technology and information systems
- access, analyze and apply knowledge and skills from various disciplines (e.g., the arts, languages, science, technology, mathematics, social sciences, and the humanities)

#### Use Numbers

- decide what needs to be measured or calculated
- observe and record data using appropriate methods, tools and technology
- make estimates and verify calculations

#### Think & Solve Problems

- assess situations and identify problems
- seek different points of view and evaluate them based on facts
- recognize the human, interpersonal, technical, scientific and mathematical dimensions of a problem
- identify the root cause of a problem
- be creative and innovative in exploring possible solutions
- readily use science, technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions
- evaluate solutions to make recommendations or decisions
- implement solutions
- check to see if a solution works, and act on opportunities for improvement

### Personal Management Skills

The personal skills, attitudes and behaviours that drive one's potential for growth

*You will be able to offer yourself greater possibilities for achievement when you can:*

#### Demonstrate Positive Attitudes & Behaviours

- feel good about yourself and be confident
- deal with people, problems and situations with honesty, integrity and personal ethics
- recognize your own and other people's good efforts
- take care of your personal health
- show interest, initiative and effort

#### Be Responsible

- set goals and priorities balancing work and personal life
- plan and manage time, money and other resources to achieve goals
- assess, weigh and manage risk
- be accountable for your actions and the actions of your group
- be socially responsible and contribute to your community

#### Be Adaptable

- work independently or as a part of a team
- carry out multiple tasks or projects
- be innovative and resourceful: identify and suggest alternative ways to achieve goals and get the job done
- be open and respond constructively to change
- learn from your mistakes and accept feedback
- cope with uncertainty

#### Learn Continuously

- be willing to continuously learn and grow
- assess personal strengths and areas for development
- set your own learning goals
- identify and access learning sources and opportunities
- plan for and achieve your learning goals

#### Work Safely

- be aware of personal and group health and safety practices and procedures, and act in accordance with these

### Teamwork Skills

The skills and attributes needed to contribute productively

*You will be better prepared to add value to the outcomes of a task, project or team when you can:*

#### Work with Others

- understand and work within the dynamics of a group
- ensure that a team's purpose and objectives are clear
- be flexible: respect, be open to and supportive of the thoughts, opinions and contributions of others in a group
- recognize and respect people's diversity, individual differences and perspectives
- accept and provide feedback in a constructive and considerate manner
- contribute to a team by sharing information and expertise
- lead or support when appropriate, motivating a group for high performance
- understand the role of conflict in a group to reach solutions
- manage and resolve conflict when appropriate

#### Participate in Projects & Tasks

- plan, design or carry out a project or task from start to finish with well-defined objectives and outcomes
- develop a plan, seek feedback, test, revise and implement
- work to agreed quality standards and specifications
- select and use appropriate tools and technology for a task or project
- adapt to changing requirements and information
- continuously monitor the success of a project or task and identify ways to improve



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<p><b>Literacy/ comprehension</b></p>	<p>Literacy/comprehension recognizes the importance of learners' abilities to understand, synthesize, and think critically about reading material, as well as express ideas clearly in writing. As a fundamental skill, literacy is emphasized throughout the ALP curriculum. When literacy is highlighted as a crosscutting theme, the challenge for instructors is to find ways to include reading, writing, and comprehension skills as they teach a subject. When learners see—and show—how they read effectively, they become an integral part of the solution.</p> <p>There seems to be a strong correlation between fluent literacy skills and successful daily living. Research identifies how reading needs to be strategically taught in order to improve comprehension. For learners who struggle with literacy/comprehension skills, reading materials without guided instruction are ineffective.</p> <p>All ALP instructors must build the skills and confidence their learners need to focus on reading comprehension and writing development during classroom activities.</p>
<p><b>Numeracy</b></p>	<p>The ability to solve daily living and workplace problems using math skills is becoming increasingly important. Although digital tools help with computation, independent problem-solving strategies are highly valued by employers. This is especially evident in trades and technologies where math skills are required to apply for a job and to keep it.</p> <p>According to statistical data, educators face serious challenges to improve the numeracy skills of Nova Scotian learners. During the years 2002–2005, there was a decrease in learners who successfully completed the math portion of the General Equivalency Diploma (GED). In spite of this, learners have made great strides in math when offered a chance to take on leadership and work in a collaborative environment.</p> <p>Instructors need to use practical examples to teach learners why particular mathematical skills are the ones they use to solve problems. It is important for learners to integrate the math skills they learn at home and at work.</p> <p>ALP instructors can help learners to improve their numeracy skills by making direct connections to the mathematics and problem-solving skills required in their subject areas.</p>

<p><b>Inclusivity/diversity</b></p>	<p>ALP learners come from diverse backgrounds and cultures. Some have diagnosed disabilities; others have serious blocks to learning that have not been identified. Having the instructor know and respect them as individuals is essential for learners to reach their potential, especially since low self-esteem often prevents ALP learners from achieving. In order to address low-self esteem issues, the ALP environment was created from respect for adult learners, their heritage, and their individual ways of learning. Teaching the value and acceptance of personal differences is one of the most rewarding things an ALP instructor can do.</p> <p>The key is positive communication. When the instructor facilitates the crosscutting themes of inclusivity and diversity, all learners feel welcome, supported, and respected. This allows ALP instructors to help learners build their confidence and define their goals.</p> <p>The ALP curriculum uses several strategies to encourage learners and instructors to explore and celebrate who they are:</p> <ul style="list-style-type: none"> <li>• making personal and cultural explorations part of course outcomes and demonstrations</li> <li>• suggesting activities that require learners to reflect on their backgrounds, culture, communities, attitudes, learning strengths, and challenges</li> <li>• providing appendices with activities to help learners and instructors recognize their backgrounds and prior knowledge before going on to learn new knowledge or skills</li> <li>• incorporating assistive technology into teaching and learning activities and resources</li> </ul>
<p><b>Technology</b></p>	<p>Technology affects everyone in Nova Scotia. Whether it's gas pumps that accept credit cards, high-speed Internet, or programmable household appliances, technology is everywhere. Labour-intensive jobs that have not disappeared have merged with technology, requiring applicants to have skills in this area.</p> <p>Integrating technology into all aspects of the Adult Learning Program helps ALP learners gain confidence and skills in using these technologies.</p>

<p><b>Technology</b> (cont'd)</p>	<p>The ALP curriculum guides reflect a variety of uses and functions of technology:</p> <ul style="list-style-type: none"> <li>• Basic Operations and Concepts: These concepts and skills help people use information technologies efficiently and safely.</li> <li>• Productivity Tools and Software: These help people select and use technology efficiently to perform tasks including these: <ul style="list-style-type: none"> <li>– exploring ideas</li> <li>– collecting data</li> <li>– working with data, which includes discovering patterns and relationships</li> <li>– solving problems</li> <li>– showing what has been learned</li> </ul> </li> <li>• Communications Technology: These are specific, interactive technologies that support collaboration and sharing.</li> <li>• Research, Problem Solving, and Decision Making: These tools help learners use technology to organize, reason, and evaluate.</li> <li>• Social, Ethical, and Human Issues: Learners need to understand how to use the technologies that encourage them to build and improve their learning environments and to foster strong relationships with their peers and others who support their learning.</li> </ul> <p>ALP instructors help learners to embrace technology by providing them with choices of tools to work with, including CDs and the Internet. In addition, ALP instructors offer Assistive Technology options for learners who want to find out if certain hardware/software applications can help them learn. Finding these applications helps learners gain the confidence and skills they need to ensure their employability in the changing workplace.</p>
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## Benefits of Outcomes-Based Curriculum for Adult Learners

Curriculum outcomes are the foundation for all ALP curriculum guides. They clearly state what learners are expected to know, do, and value at the end of every ALP course.

Demonstrations provide details and help clarify what knowledge, skills, and attitudes learners are expected to gain with each learning outcome.

Using outcomes and demonstrations clarifies the goals for instruction. It also helps instructors and students to focus on the learning experiences that are relevant to achieving these results. Only a student can achieve an outcome; instructors, textbooks, or groups of students cannot. When planning, it is important to consider what criteria indicate whether a student has achieved the desired outcome and how the instructor may lead the student to that point. This process is as diverse as the learners.

### Outcomes-Based Curriculum Encourages Effective Adult Learning Principles

<p><b>Provides Opportunities for Prior Learning and Recognition (PLAR)</b></p>	<p>Organizing an adult program around specific outcomes and demonstrations lets learners identify what parts of a course they already know and what skills and attitudes they have. This process of prior learning and recognition (PLAR) can help learners avoid unnecessary repetition as they navigate through the ALP toward their goals.</p>
<p><b>Encourages Learner Self-Reflection, Self-Assessment, and Goal Setting</b></p>	<p>Clear outcomes place learners at the centre of the goal-setting and assessment process. Self-assessment is a metacognitive process involving self-observation and self-awareness, leading to the active steps of self-regulation and the continuation of this cycle.</p> <p>Learners are the active agents in this process. Instructors can encourage learners to identify their strengths and weaknesses and to set both personal and career goals, and they can help them establish self-assessment criteria for measuring their success.</p>
<p><b>Promotes Flexibility of Delivery</b></p>	<p>ALP curriculum guides suggest sequences of instruction and ways to organize the outcomes into units. However, instructors can choose how best to teach the outcomes and demonstrations based on the needs and interests of their learners.</p>

## Features of ALP Curriculum Guides

The four-column format of the ALP curriculum guides does several things:

- illustrates how learning experiences flow from learning outcomes
- provides suggestions for teaching and learning for specific outcomes
- shows the relationship between outcomes and assessment strategies
- allows instructors to read the curriculum outline in many different ways
- makes it easier to search for specific information

### The Two Page, Four-Column Spread

Each Adult Learning Program curriculum guide uses these elements:

<b>Column One: Outcomes</b>	<ul style="list-style-type: none"> <li>• This column contains outcome statements that describe what learners are expected to know, to be able to do, and to value by the end of the course.</li> </ul>
<b>Column Two: Elaborations</b>	<ul style="list-style-type: none"> <li>• This column provides clarifications and elaborations of the outcome found in column one. This is accomplished by recommending specific learning opportunities for the learners.</li> </ul>
<b>Column Three: Suggested Teaching and Evaluation Items</b>	<ul style="list-style-type: none"> <li>• This column contains a variety of teaching and assessment items that learners should be exposed to. The intention of this column is to illustrate the wide range of questions that can be used to address specific outcomes.</li> </ul>
<b>Column Four: Resources and Notes</b>	<ul style="list-style-type: none"> <li>• This column suggests specific print resources and online resources that may help learners achieve learning outcomes. These resources also motivate, reflect an appropriate reading level, and support a range of differing learning preferences, styles, and needs. Instructors are not restricted to resources listed in this column. Instructors are encouraged to identify and use other resources that meet the needs of the students and support the outcomes in the curriculum document.</li> </ul>

### The One Page, Two-Column Spread

The Adult Education division will also be creating a one page, two column spread of this document. It will contain all the same material (outcomes, elaborations, teaching and evaluation items, and resources and notes) but in a slightly difference layout. The two page, four column version and the alternative version of the curriculum document will both be posted to SharePoint.

## Characteristics of Effective ALP Delivery

Sharing an understanding about effective instruction will help NSSAL partners to deliver the ALP curriculum successfully. The following principles of adult learning are part of an effective program.

<b>Principle of Learning</b>	<b>Role of Instructors and Administrators</b>
Learning is a process of actively constructing meaning.	<ul style="list-style-type: none"> <li>• create learning environments that foster investigation, debate, participation, exploration, communication, questioning, collecting, and finding ways to predict</li> <li>• provide learners with meaningful experiences</li> <li>• help learners to develop methods of learning</li> </ul>
Learners construct knowledge and make it meaningful by relating it to their prior knowledge and experiences.	<ul style="list-style-type: none"> <li>• find out what learners already know and can do</li> <li>• create learning environments and plan experiences that build on learners' prior knowledge</li> <li>• acknowledge and respect learners' learning experiences that may influence their ways of perceiving, thinking, feeling, and approaching the world</li> <li>• respect and support learners' racial, cultural, and social identities</li> <li>• recognize, value, and use the great diversity of experiences and information learners bring with them</li> <li>• make sure that the learning materials reflect the diversity of learners</li> <li>• make sure learners are challenged to build on their prior knowledge, integrating new knowledge with what they already understand</li> </ul>
Learning is enhanced when it takes place in a social and collaborative environment.	<ul style="list-style-type: none"> <li>• make discussion, group work, and collaborative ventures central to classroom activities</li> <li>• structure opportunities where learners can interact in diverse social activities</li> <li>• make sure learners recognize the importance of transferring social and collaborative skills into their everyday lives</li> <li>• help learners to see themselves as members of a community of learners</li> </ul>

<b>Principle of Learning</b>	<b>Role of Instructors and Administrators</b>
Learners are able to see their learning as an integrated whole.	<ul style="list-style-type: none"> <li>• plan opportunities to help learners make connections across the curriculum and link them with the outside world</li> <li>• provide learners with opportunities to apply strategies from across the curriculum to problems in real situations</li> </ul>
Learners must see themselves as capable and successful.	<ul style="list-style-type: none"> <li>• make sure that all learners experience genuine success on a regular basis</li> <li>• value experimentation and approximation as signs of growth</li> <li>• provide learning experiences and resources that reflect the diversity of the local and global community</li> <li>• provide learning opportunities that develop self-esteem without using self-esteem as a goal in itself</li> </ul>
Learners have different ways of representing knowledge.	<ul style="list-style-type: none"> <li>• recognize each learner's preferred style of constructing meaning and provide opportunities for exploring alternative ways</li> <li>• recognize, acknowledge, and build on learners' diverse ways of representing knowledge—showing what they have learned</li> <li>• plan a variety of open-ended experiences and assessment strategies</li> </ul>
Reflection is an integral part of learning.	<ul style="list-style-type: none"> <li>• observe and reflect on their own learning processes and experiences</li> <li>• challenge their own beliefs and practices through continuous reflection</li> <li>• encourage learners to observe and reflect on their own learning processes and experiences</li> <li>• encourage learners to acknowledge and articulate their learning needs, styles, and preferences</li> <li>• help learners use their reflections to change their behaviours and adjust their learning strategies</li> </ul>

## **Creating an Effective Learning Environment**

Many of our learners have struggled to learn adequate literacy and numeracy skills and are now returning to learning to try one more time. ALP instructors need to meet their act of courage with an equal response of respect. The ALP curriculum is designed to use several elements that help instructors encourage their learners by creating a safe and effective environment:

- creating a welcoming environment
- building mutual respect
- taking different roles with learners
- identifying different learning profiles
- differentiating instruction to support learning profiles
- engaging learners
- organizing learning experiences to engage learners

### **Creating a Welcoming Environment**

As teachers select learning experiences that engage and motivate, they must remember that they are not just teaching a group of learners, they are teaching a group of individuals, many of whom take great pride in being—and staying—unique. A “one-size fits all” approach will likely have little effect. Engaging learners starts with knowing the learners—each of them. Beyond learners believing in their own abilities and capabilities, teachers must believe as well, and communicate their belief through the efforts they make to include learners as partners in their learning.

### **Taking Different Roles with Learners**

To support learners as they engage with learning, and to help them stay with it, instructors need to take on many roles: model learners, instructors, assessors, supporters, and advocates. They need to try many approaches: motivate, model, provide explicit instruction, coach, integrate literacy skills, and integrate technology.

## Differentiating Instruction to Support Learning Profiles

Partnerships between learners and teachers, and based on their understanding of the learner's learning profile, allow instructors to help learners find ways to become more productive learners. The whole process encourages learners to feel optimistic, to collaborate, and to recover their motivation by giving them a positive vision of their futures.

In the appendix, the curriculum guide offers teaching suggestions to reinforce constructs that get in the way of meeting outcomes. It also offers a range of teaching suggestions that use a variety of media, technology, and other ways to vary the teaching and learning environment.

## Engaging Learners

Teachers should consider the following suggestions for engaging learners:

- Seek to know the person within the learner. Although learner surveys or inventories can be helpful, nothing beats a one-to-one conversation. Each of us appreciates when someone shows sincere interest in our lives, in who we are, and in what matters to us. Be willing to share a little about yourself—as a person. Letting learners know who we are helps build trust, the foundation for the teacher-learner relationship.
- Build in opportunities for learners to have a voice. Many learners feel that they have been excluded from their past learning experiences. Invite their views and opinions in meaningful contexts and create genuine opportunities for them to see their voices in action.
- Collaborate when you set criteria for learning and for individual assignments. Your involvement will ensure that certain goals are included; inviting learner input will help them own the learning and related tasks; they will be more interested, motivated, and engaged, and they will learn more.
- Set goals that are attainable and that will promote a sense of accomplishment and self-satisfaction. It is essential to invite learners to be part of setting learning goals.
- Offer choice, whenever possible
  - of reading material
  - of methods to present knowledge and information
  - of the topic for assignment or the focus within a topic
- Remember this: as important as it is to be positive and encouraging in our response to learner work, it is equally important to be honest and sincere in order to develop a trusting relationship.

## **Engaging Learners through Interactive Learning**

Interactive learning is built on this premise: we learn best when we engage our minds, and we are more apt to engage when we interact with others. Instructors take the lead in guiding learners to become more-effective learners when they create opportunities using explicit teaching and modelling, and monitor focused, interactive strategies for learning.

Many strategies are described in this document. Taking the time to read the research behind these strategies will help instructors understand why certain strategies work, how to make suitable adaptations, and how to create supports to help them make learning more relevant and engaging to all learners.

Here are a few strategies that put interactive learning into practice. Most require learners to interact in small discussion groups. Research suggests that this can be more effective than open dialogue between the teacher and the whole class where often only a small number of learners participate while others remain uninvolved.

### **Front Loading**

Effective teaching practice recognizes that many learners approach a new concept or piece of text with limited familiarity. These learners then have a difficult time making sense of new information since they have few “hooks” on which to connect new learning. Front loading is a pre-reading strategy in which learner groups are given time to share their understandings of the key terms and background information, helping all learners build prior knowledge, which, in turn, creates those “hooks” or links to new learning so necessary to constructing meaning.

### **Using Authentic Materials for Real Purposes**

Authentic materials and resources give learners instant feedback about how their literacy and numeracy skills are increasing.

When they read newspapers, magazines, graphs, tables, websites, menus, workplace documents, and other materials found throughout their communities, it reinforces that they have joined the “club” of readers, writers and math savvy adults. In apprenticeship circles, learning by doing is widely recognized as the most effective path to personal mastery.

### **Developing Self-Esteem through Expertise**

Activities that embody a series of outcomes and relate them to one another and that use a range of resources let learners make more connections that mean something to them. After they work with one topic over a significant period of time, learners are able to build up a body of knowledge and expertise. The goal is that they will become enthusiastic about the topic. Powerful by-products of this process are that they change learners’ perspective about their self-worth and their self-esteem grows.

### **“The Big Six”**

“The Big Six” refer to reading comprehension strategies that support readers as they aim to construct meaning and become aware of what they understand through interacting with text. These strategies are (1) making connections, (2) inferring, (3) synthesizing, (4) questioning, (5) determining importance, and (6) visualizing. Teachers could

present focused mini-lessons that teach and model each strategy and then offer authentic opportunities for learners to apply them.

### Organizing Learning Experiences to Engage Learners

Focus	Description	Examples of Learner Products
Projects	Products built around <ul style="list-style-type: none"> <li>• prior knowledge and experiences</li> <li>• topics of interest</li> <li>• questions to answer</li> </ul>	<ul style="list-style-type: none"> <li>• write questions with answers</li> <li>• build a model with explanation</li> <li>• put together a photo album with written explanation</li> <li>• create a poster or brochure</li> <li>• create a game</li> </ul>
Issues	Investigations of topical questions that consider several perspectives	<ul style="list-style-type: none"> <li>• participate in a debate</li> <li>• use persuasive writing</li> <li>• do a survey with analysis</li> </ul>
Workshops	Hands-on, active learning, characterized by learning through doing; this includes reader, writer, video, photo, or drama workshops	<ul style="list-style-type: none"> <li>• read final versions of writing</li> <li>• publish written work</li> <li>• put together a photo gallery</li> <li>• present a drama</li> <li>• create something together</li> </ul>
Themes	Creation and response to a range of texts focused on a central idea	<ul style="list-style-type: none"> <li>• put together a learning fair or expo</li> <li>• exhibit something in a public space</li> <li>• do a themed publication of various learners' work</li> </ul>
Author study	Explorations and investigations of specific authors, including historical and cultural contexts	<ul style="list-style-type: none"> <li>• make a presentation in the library</li> <li>• participate on a panel</li> <li>• give a reading and mini-lecture</li> <li>• do a PowerPoint presentation</li> </ul>

<b>Focus</b>	<b>Description</b>	<b>Examples of Learner Products</b>
Media study	Creation and comparison of ideas and cultural contexts expressed through a variety of media	<ul style="list-style-type: none"> <li>• use WebQuest</li> <li>• create a website</li> <li>• put together a video festival</li> <li>• screen advertisements</li> </ul>
Historical, geographic, cultural exploration	Exploration of particular times, events, places, and cultures	<ul style="list-style-type: none"> <li>• develop an annotated time line</li> <li>• write a historical drama</li> <li>• put together a cultural fair</li> <li>• translate information to show how it matches today's language and culture</li> </ul>
Science exploration	Exploration of particular topics, concepts, and processes using inquiry, exploration, and experimentation	<ul style="list-style-type: none"> <li>• demonstrate lab results</li> <li>• guide people on a field trip with handouts</li> <li>• develop a question-and-answer book</li> </ul>

## Providing Meaningful Assessment

Assessment differs from evaluation. Effective assessment helps guide learners to continue to learn and explore. Instructors may give informal feedback, such as in a conversation, or more formal feedback, such as through written comments or by placing a learner within a rubric. A rubric is usually a chart that describes a learner's work on a scale from poor quality to exceptional quality. It can be created with learners or for them and provides particular criteria for whatever you are trying to assess. This gives learners more detailed feedback about where their work sits on a scale and provides a road map for improvement. Assessments are usually given frequently, to help both learners and teachers plan their instructional activities.

Evaluation provides learners with a rank or mark so that they can see how their progress compares with other learners. It also allows the learner to track their own improvement over an extended period of time. Evaluation is often provided at the end of a learning cycle.

Both assessments and evaluations are useful; ALP instructors will need to be selective in their use.

To determine when to use an assessment, consider the following questions:

- Is the feedback providing clear and useful information to the learner about their progress?
- Can the learner make use of this feedback in order to progress?
- What effect will this feedback have on the motivation of the learner to continue learning?
- Does the feedback lead the learner and instructor to set specific goals?
- Does the feedback help the teacher to plan the most suitable learning activities for this learner?

To determine when to use an evaluation consider the following questions:

- Is the feedback providing a final summary about the learner's progress for a section of learning?
- Will the feedback help to inform learners about why they are moving on or not moving on to a new section of learning?
- Will the feedback help learners understand the parts of the learning where they excelled and where they require more attention?

## Characteristics of Effective ALP Assessment

Assessment is the systematic process of gathering information on learner learning in order to improve learner success and provide a basis for evaluation. High-quality assessment practices are essential to high-quality education. Effective assessment practices contain the following characteristics:

Assessments promote learning.	<ul style="list-style-type: none"> <li>▪ Assessments should be used to help learners recognize their learning strengths and identify ways they can further develop.</li> <li>▪ Assessments can provide valuable insights about learners' learning needs and styles, and instructors can use assessments to give learners useful feedback and guide their efforts toward improvement.</li> </ul>
Assessments influence the instructor's approach.	<ul style="list-style-type: none"> <li>▪ Reflecting on this information helps instructors to evaluate the effectiveness of their instructional approaches and to adjust them accordingly.</li> </ul>
Assessments inform evaluation.	<ul style="list-style-type: none"> <li>▪ Evaluation is the process of analysing, reflecting upon, and summarizing information from assessments and making decisions based upon the information gathered.</li> </ul>
Assessments vary with contexts and needs.	<ul style="list-style-type: none"> <li>▪ A variety of assessment strategies can provide valuable insight about learners' strengths to ensure that the instructor is recognizing their diverse learning needs.</li> </ul>
Assessments help learners to set realistic career and life goals.	<ul style="list-style-type: none"> <li>▪ Assessments provide foundations and milestones for setting time lines for ALP learners and instructors.</li> <li>▪ Achievement gives learners the motivation to set goals.</li> <li>• ALP learners will develop their portfolios based on these goals, which in turn will act as a tool to help them reach future goals.</li> </ul>



## Changes to Graduate Science Level IV Curriculum

### Rationale for Curriculum Review

The decision to review the Science Level IV curriculum was made for several reasons.

- (1) In a 2006 survey, NSCC/ALP instructors were asked to prioritize existing ALP courses for curriculum review. The responses overwhelmingly identified a need to revisit the Level IV Graduate Science and Level IV Graduate Math curriculums. Based on this information the curriculum consultants from the LWD and NSCC decided to work simultaneously on both curriculums during the 2007/2008 and 2008/2009 school years.
- (2) The focus of curriculum design had changed since the original inception of Level IV curriculum in 2001. With the introduction of the five crosscutting themes (employability, literacy/comprehension, numeracy, inclusivity/diversity, and technology), greater emphasis on outcome-based curriculum, and the assignment of the Adult Education Division to the Department of Labour and Workforce Development (LWD), it was time to revisit the Level IV curriculum to determine if it unfulfilled the needs and direction desired from our learners, the instructors, the NSCC, and the LWD.
- (3) The Faculty Working Group (FWG) members expressed concern that the original science curriculum relied too heavily on locally developed modules. The perception became that the module was the curriculum, and that instructors struggled with the notion of deviating from the modules. There have been several changes to the new Level IV Science curriculum to deal with this issue. The first change was the creation of a separate curriculum document that is not specifically tied to any one set of locally-developed resources or a specific resource from a large publishing company. Instructors are required to deliver outcomes articulated in the document but are permitted to exercise their professional judgment in the delivery of those outcomes. The second change occurred in the area of resource selection. Rather than relying on one resource for the entire course or a specific unit, the faculty working group made every effort to ensure that there were multiple resources (professionally written, locally developed, and/or online) for each unit. In a sense, instructors now have a small library of resources that will assist with the delivery of the curriculum.
- (4) Many of the FWG members were concerned that the original curriculum required learners to complete numerous research papers, and de-emphasized experiences that would be described as "hands-on." They contended that learners would find the material more engaging if the learners had the opportunity to truly experience science and, in many cases, share these experiences with other learners.
- (5) Although the original curriculum covered several topics that were relevant and, in some cases, life altering to learners, the FWG members saw a need to limit the number of topics covered in the course. They felt that learners would be better served if the remaining topics could be covered in greater depth and if the learners had the flexibility to explore aspects of a topic that were of personal interest.

## **Sharing Information with Other NSCC Instructors**

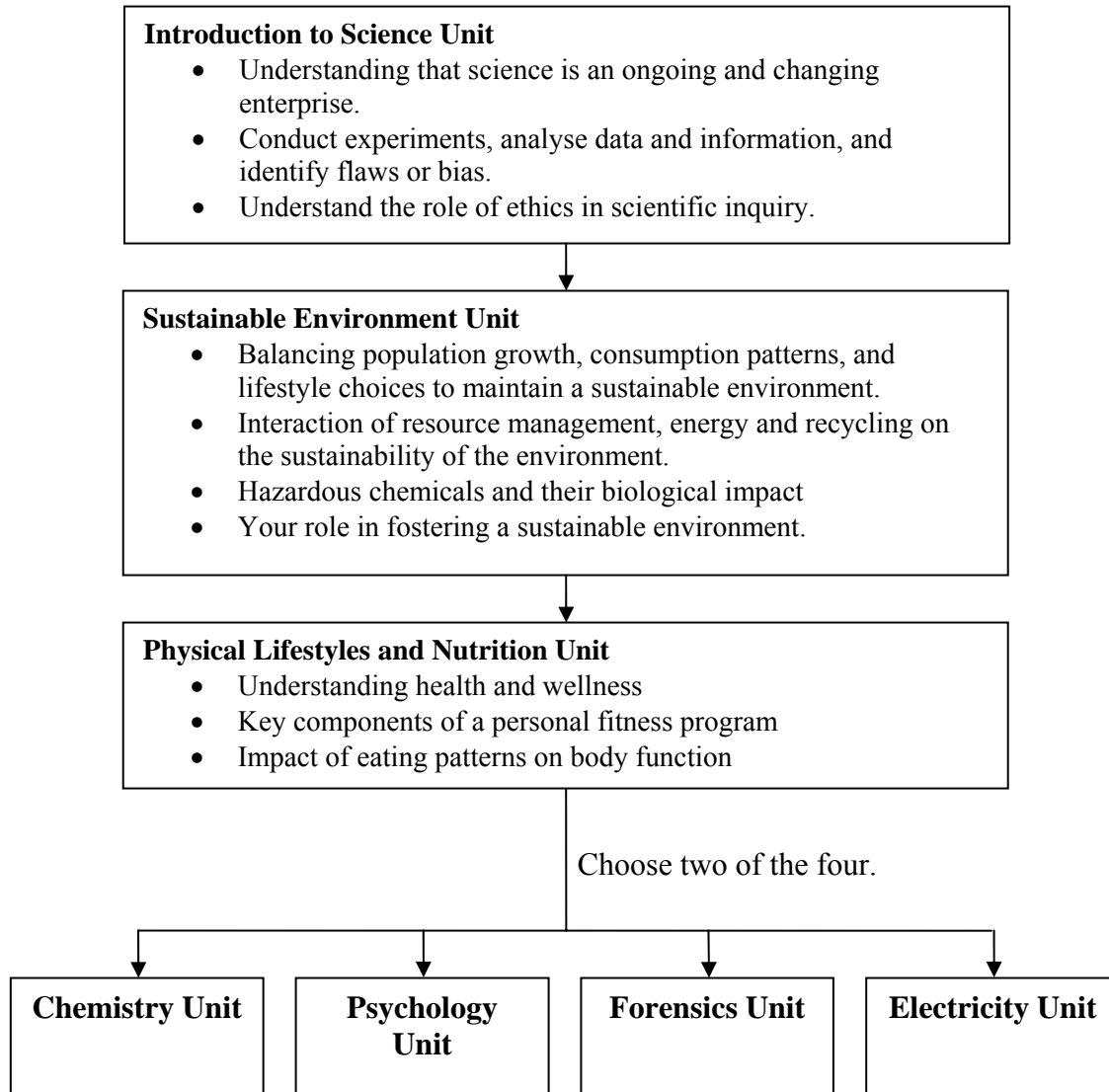
Teaching in the Adult Learning Program is a demanding, yet very rewarding, job. Continuous intake, the diversity of learning styles, irregular attendance, and a host of barriers experienced by our learners require instructors to expend a great deal of energy and time on matters not normally experienced by traditional public school teachers. Although these issues are a reality of all adult education programs in the country, the LWD, NSCC, and FWG have made every attempt to create a curriculum, resources, and supports that reduce the preparatory time presently experienced by ALP science instructors. SharePoint is a critical part of that support system. Locally developed units, teaching suggestions, and assessment items have been created by the FWG and posted to SharePoint to assist all ALP instructors. This Graduate Science IV SharePoint site is not a static feature. With the assistance of all ALP instructors, the site will grow. Everyone, learners and instructors, will be better served by a site populated by diverse and rich materials.

## **Locally Developed Science Resources**

When the FWG embarked on the Graduate Science IV curriculum review, it was hoped that we could find professionally written resources or semi-customized resources that would meet our needs. We had success finding primary resources for the Physical Life Style and Nutrition Unit, Electricity Unit, Chemistry Unit and Psychology Unit. We were also able to identify a secondary resource for the Forensics Unit. Unfortunately we did not find suitable resources for the first two units; Introduction to Science and Sustainable Environment. The decision was made to create locally developed materials for these two units and subsequently FWG members created materials for two additional units. These locally developed units were piloted and revised based on the suggestions of instructors and learners. These units have been posted on SharePoint in both PDF and MS Word forms. NSCC instructors are permitted to alter the MS Word versions of these units to meet the needs of their learners. When modifying a locally developed science resource, instructors should refer to the curriculum document to ensure that all of the required outcomes are still being met in their modified version of the resource.

## The Big Picture

The following flow chart shows the three required units and the four optional units (choose two of the four) in Level IV Science. These have been presented in a suggested order. Instructors and students may choose to alter this order to best serve the needs of the learner. Not all of the units take the same amount of time to complete. For example, the Introduction to Science unit is quite short. By contrast, the other two required units (Physical Lifestyles and Nutrition Unit and Sustainable Environment Unit) require the greatest amount of time.



**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<b>Outcomes</b> <i>Learners will be expected to</i>	<b>Elaborations</b>
1.1 Demonstrate an understanding that science, both pure and applied, is an ongoing changing enterprise. (Continued on the next pages.)	<ul style="list-style-type: none"> <li>• Have learners describe science and technology in order to illustrate the association between these disciplines.</li> </ul>

**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- Assignment: Pure Science versus Applied Science           <ul style="list-style-type: none"> <li>(a) Read the following two news releases from <i>The Pure Science News</i>.               <p><b>Rheumatoid Arthritis Breakthrough</b> <i>ScienceDaily</i> (Nov. 12, 2008) — A new article reports a breakthrough in the understanding of how autoimmune responses can be controlled, offering a promising new strategy for therapy development for rheumatoid arthritis.</p> <p><b>Chronic Pain Might Contribute to Suicidal Thoughts</b> <i>ScienceDaily</i> (Nov. 13, 2008) — New research suggests that patients with chronic pain are more prone than others are to consider suicide. The increased risk remained even when study authors took the possible influence of mental illness into account.</p> </li> <li>(b) Read the following two news releases from <i>The Applied Science News</i>.               <p><b>Umbilical Cord Blood May Help Build New Heart Valves</b> <i>ScienceDaily</i> (Nov. 11, 2008) — Children with heart defects may someday receive perfectly-matched new heart valves built using stem cells from their umbilical cord blood, according to research presented at the American Heart Association’s Scientific Sessions 2008.</p> <p><b>Heart Valves that Grow with the Patient</b> <i>ScienceDaily</i> (Oct. 23, 2008) — Three scientists have developed and successfully transplanted tissue-engineered biological cardiac valves for children that grow with the patients.</p> </li> <li>(c) In your own words, define Pure Science and Applied Science</li> </ul> </li> <li>- Go to the following website and view the PowerPoint presentation that describes the relationship between science and technology. <a href="http://www.authorstream.com/presentation/sabanci-60416-TECHNOLOGY-VS-SCIENCE-presentation-goal-different-answers-technologyvssci-Education-ppt-powerpoint/">http://www.authorstream.com/presentation/sabanci-60416-TECHNOLOGY-VS-SCIENCE-presentation-goal-different-answers-technologyvssci-Education-ppt-powerpoint/</a> (or google <i>authorstream technology vs science</i>) In your own words, explain what science is, what technology is, and the relationship between the two.</li> <li>- Have learners construct a concept map showing the relationship between one or more scientific discoveries and the technologies related to that discovery.</li> </ul>	<p><b>Print Resources:</b> Introduction to Science Unit (Marchand and Harvie)</p> <p><b>Online Resources:</b> Authorstream Technology vs Science  Science and You Pure Applied What's the Difference  Vonny Pure Science Versus Applied Science  Canada Science and Technology Museum Virtual Programs</p>

**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<b>Outcomes</b> <i>Learners will be expected to</i>	<b>Elaborations</b>
1.1 Demonstrate an understanding that science, both pure and applied, is an ongoing changing enterprise. (Continued from previous pages.)	<ul style="list-style-type: none"> <li>• Have learners identify and analyse the impact of science and technology on society and the environment.</li> </ul>

**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- Read the article <i>Assessing the Impact of Technology on the Environment</i> by Willingwriter (2008) and answer the following. The article can be found at: <a href="http://www.associatedcontent.com/article/529905/assessing_the_impact_of_technology.html?cat=15">http://www.associatedcontent.com/article/529905/assessing_the_impact_of_technology.html?cat=15</a> (or by googling <i>Assessing the Impact of Technology on the Environment Willingwriter</i>)               <ul style="list-style-type: none"> <li>(a) List both the positive and negative impacts of technology on the environment.</li> <li>(b) Do you think that generally technologies developed from applied science in Canada have a positive or negative impact on the environment? Explain.</li> </ul> </li> <li>- What would life be like if the light bulb had not been invented?</li> <li>- Give an example of a revolutionary technology or scientific advancement that has occurred in the last ten years.</li> <li>- Olympic and World records continue to be shattered. How is this possible? Aren't we close to the limit of human potential as far as sporting events go? Is science and technology taking us further than anyone expected? Go to the following website, read the article, and answer the following questions. <a href="http://www.jansamachar.net/display.php3?id=&amp;num=13948&amp;lang=English">http://www.jansamachar.net/display.php3?id=&amp;num=13948&amp;lang=English</a> (or google <i>The Impact of Science and Technology on Olympics Joshi</i>)               <ul style="list-style-type: none"> <li>(a) Which advancement was the biggest surprise for you? Why?</li> <li>(b) Do these advancements create a level playing field for all athletes from all countries? Why or why not?</li> <li>(c) Some people are concerned that there may be future advancements in science that may have greater impact on sport? In your opinion, what future advancement could potentially affect sport?</li> </ul> </li> </ul>	<p><b>Print Resources:</b> Introduction to Science Unit (Marchand and Harvie)</p> <p><b>Online Resources:</b> Assessing the Impact of Technology on the Environment Willingwriter</p> <p>The Impact of Science and Technology on Olympics Joshi</p> <p>Physicsworld Predicting the Impact of Science</p> <p>Prof P Krishna Impact of Science on Society</p>

**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>1.2 Analyse data and information and evaluate evidence and sources of information, identifying flaws such as errors or bias.</p>	<ul style="list-style-type: none"> <li>• Have learners identify independent, dependent and controlled variables.</li>   <li>• Have learners distinguish between theory and opinion.</li>   <li>• Have learners investigate a scientific phenomenon using the scientific method and complete lab reports.</li> </ul>

**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>												
<ul style="list-style-type: none"> <li>- Does the amount of water given to tomato plants have any effect on the number of tomatoes produced by the plant? Based on the question, identify the dependent variable and the independent variable, and then determine which of remaining factors should be constants.                             <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Amount of Fertilizer</td> <td style="border-bottom: 1px solid black; width: 40%;"></td> </tr> <tr> <td>Amount of Water</td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td>Amount of Sunlight</td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td>Number of Tomatoes Produced</td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td>Size of Planting Pot</td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td>Exposure to Insects</td> <td style="border-bottom: 1px solid black;"></td> </tr> </table> </li> <li>- Create an experiment that describes the effect of sunlight on plant growth. Within this experiment determine the independent, dependent and controlled variables.</li> <li>- Read the article <i>Antibacterial Products May do more Harm than Good</i> by Coco Ballantyne (2007) and answer the following questions.                             <ul style="list-style-type: none"> <li>(a) Did your opinion change after you were presented with “facts” about antibacterial products? Explain why.</li> <li>(b) After being made aware of these facts, do you see any problem with making your own opinion on something without having scientific evidence to back it up?</li> </ul> </li> <li>- On February 1, 2003, the space shuttle Columbia disintegrated during re-entry into the Earth’s atmosphere. All seven members of the crew were lost. The Columbia Accident Investigation Board (CAIB) investigated the disaster, established a theory for the tragedy, and made recommendations. The magazine Popular Mechanics chronicled the investigation from February 3 to Aug 3. These reports can be found by googling <i>Popular Mechanics Space Shuttle Columbia Disaster Index</i> or by going directly to:                             <p style="margin-left: 20px;"><a href="http://www.popularmechanics.com/science/air_space/1282976.html">http://www.popularmechanics.com/science/air_space/1282976.html</a></p> <ul style="list-style-type: none"> <li>(a) Early in the process, what were some of the possible causes that the investigators were considering?</li> <li>(b) After several months of investigation, what was the CAIB’s theory for the disaster? What evidence supported this theory?</li> </ul> </li> <li>- Complete the <i>Penny Lab</i> and write a report using the lab report template as your guide. In this experiment learners examine the effect of soap on the surface tension of water.</li> <li>- Participate in a “citizen science” experiment. By googling <i>citizenscience.ca</i>, learners can gain access to a variety of genuine scientific research projects that rely on citizen participation. For example, learners might report the monarch butterfly count for their area, or provide a meteor count during an expected meteor shower.</li> </ul>	Amount of Fertilizer		Amount of Water		Amount of Sunlight		Number of Tomatoes Produced		Size of Planting Pot		Exposure to Insects		<p><b>Print Resources:</b></p> <p>Introduction to Science Unit (Marchand and Harvie)</p> <p><b>Online Resources:</b></p> <p>Connexions Independent and Dependent Variables</p> <p>Cool Science Projects Independent and Dependent Variables</p> <p>Antibacterial Products May do more Harm than Good Coco Ballantyne</p> <p>Austin Cline Scientific Theories The Criteria for Science</p> <p>YouTube: Evolution vs. Creationism Is Evolution Just a Theory</p> <p>TED Kary Mullis on What Scientists Do</p> <p>YouTube: 10 The Scientific Method Made Easy</p> <p>Sciencebuddies Steps of the Scientific Method</p> <p>Howstuffworks Scientific Method Controlled Experiment</p> <p>Popular Mechanics Space Shuttle Columbia Disaster Index</p>
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**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>1.3 Demonstrate an understanding of the role of ethics in scientific inquiry.</p>	<ul style="list-style-type: none"> <li>• Have learners investigate situations that prompted the development of ethic policies and procedures in scientific inquiry.</li>   <li>• Have learners describe the importance of peer review in the development of scientific knowledge.</li> </ul>

**Unit 1: Introduction to Science (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the scientific inquiry by engaging in such inquiry and through the examination of case studies.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- Google search <i>Top 10 Unethical Psychological Experiments</i> or go to: <a href="http://listverse.com/science/top-10-unethical-psychological-experiments/">http://listverse.com/science/top-10-unethical-psychological-experiments/</a> <ul style="list-style-type: none"> <li>(a) Pick an experiment, describe the experiment, and make some personal comments.</li> <li>(b) Do you think that university ethic review committees should consider the ethical treatment of subjects when determining whether the research project should be approved? Why or why not?</li> </ul> </li> <li>- Have learners debate a controversial ethical issue in science (e.g. funding of Tazer research studies when the funding originates with the company that produces the device).</li> <li>- Have learners complete an experiment that might tempt them to falsify the data to obtain what they perceive as the desired result. For example, learners might be asked to determine the density of a penny. Their assumption might be that the penny's density is equivalent to the density of copper. This assumption, however, is false because pennies are made primarily of zinc. Some students may be tempted to alter the results so that they align more closely with the density of copper.</li> <li>- Prior to the publication, a research finding must be subjected to a <b>peer review</b>. A peer review is a process by which academic articles are reviewed by other experts in the same field of study. These experts examine scientific merit of the work, participant safety, and ethical considerations. If the research and accompanying article are not considered sufficient, the article will not be published. After reading the article on Pons' and Fleischman's cold fusion experiments, Poehlman's menopausal study, and Chiranjeevi's chemistry paper, do you feel that all research articles should continue to be subjected to a peer review? Why or why not?</li> </ul>	<p><b>Print Resources:</b> Introduction to Science Unit (Marchand and Harvie)</p> <p><b>Online Resources:</b> Top 10 Unethical Psychological Experiments</p> <p>ABC News Tasers Safe? New Study Sparks More Debate</p> <p>Science Physicist Debunk Claim of a New Kind of Fusion</p> <p>New York Times An Unwelcome Discovery Poehlman</p> <p>Office of Research Integrity Eric Poehlman</p> <p>StarChild Jocelyn Bell Burnell</p> <p>YouTube: Milgram Experiment (Derren Brown)</p>

**Unit 2: Sustainable Environment (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence our ability or inability to achieve a sustainable environment.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>2.1 Explain the need to balance population growth, consumption patterns and lifestyle choices to maintain a sustainable environment.</p>	<ul style="list-style-type: none"> <li>• Have learners describe the major concepts associated with ecological health and environmental sustainability.</li>   <li>• Have learners describe trends in population growth and structure at the local, national and global levels.</li>   <li>• Have learners compare the consumption of resources in developed countries with that of developing countries.</li> </ul>

**Unit 2: Sustainable Environment (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence our ability or inability to achieve a sustainable environment.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>																																																																																	
<ul style="list-style-type: none"> <li>- A person’s ecological footprint is the amount of the earth’s surface (in hectares or acres) needed to produce the resources and to accommodate the waste that a given person needs over a period of time. Your mission is to determine your personal ecological footprint. This can be accomplished using an activity sheet titled “Ecological Footprint Calculator” available from the Fisheries and Oceans Canada website.</li> <li>- Population pyramids are an illustration of a country’s population demographic. In other words, it visually displays the age-sex structure. From this visual representation, you can determine whether a country can be categorized as developed or developing. Using the information in the following chart, create population pyramids for countries 1 through 5. After creating the 5 pyramids, determine which pyramids are either developed countries or developing countries and explain your reasons.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="9">Distribution of Population</th> </tr> <tr> <th></th> <th colspan="4">Males</th> <th colspan="4">Females</th> </tr> <tr> <th>Age</th> <th>0-19</th> <th>20-39</th> <th>40-59</th> <th>60+</th> <th>0-19</th> <th>20-39</th> <th>40-59</th> <th>60+</th> </tr> <tr> <th>Country</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>#1</td> <td>16%</td> <td>15%</td> <td>12%</td> <td>6%</td> <td>16%</td> <td>14%</td> <td>12%</td> <td>9%</td> </tr> <tr> <td>#2</td> <td>25%</td> <td>14%</td> <td>7%</td> <td>3%</td> <td>25%</td> <td>15%</td> <td>8%</td> <td>3%</td> </tr> <tr> <td>#3</td> <td>14%</td> <td>16%</td> <td>12%</td> <td>8%</td> <td>13%</td> <td>16%</td> <td>12%</td> <td>9%</td> </tr> <tr> <td>#4</td> <td>26%</td> <td>16%</td> <td>7%</td> <td>3%</td> <td>24%</td> <td>14%</td> <td>7%</td> <td>3%</td> </tr> <tr> <td>#5</td> <td>13%</td> <td>15%</td> <td>12%</td> <td>9%</td> <td>12%</td> <td>15%</td> <td>12%</td> <td>12%</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>- Read the articles <i>India, China’s resource consumption on the rise: ‘State of the World’ report</i> and <i>What’s Your Consumption Factor</i>, and answer the following questions.             <ul style="list-style-type: none"> <li>(a) Is the world on a collision course with disaster with regard to resource consumption?</li> <li>(b) Will China and India taper their drive for developed nation status in order to curb consumption?</li> <li>(c) What would the population pyramid of both these countries look like if they reach developed status?</li> </ul> </li> <li>- After reading the article <i>The Looming Food Crisis</i> and watching the YouTube videos <i>World Food Crisis Looming</i> and <i>Looming Worldwide Food Crisis</i>, answer the following questions.             <ul style="list-style-type: none"> <li>(a) What are some of the causes behind the looming food crisis?</li> <li>(b) What is the danger of using biofuels?</li> <li>(c) What factors have pushed the price of food up?</li> <li>(d) How do high oil prices affect food prices?</li> <li>(e) How many people globally are affected by the rise in prices?</li> <li>(f) What are the human problems associated with the rise in food prices?</li> </ul> </li> </ul>	Distribution of Population										Males				Females				Age	0-19	20-39	40-59	60+	0-19	20-39	40-59	60+	Country									#1	16%	15%	12%	6%	16%	14%	12%	9%	#2	25%	14%	7%	3%	25%	15%	8%	3%	#3	14%	16%	12%	8%	13%	16%	12%	9%	#4	26%	16%	7%	3%	24%	14%	7%	3%	#5	13%	15%	12%	9%	12%	15%	12%	12%	<p><b>Print Resources:</b> Sustainable Environment Unit (Ingram, Tattrie, and Harvie)</p> <p><b>Online Resources:</b> YouTube: Interview with David Suzuki.</p> <p>Learningspace Ecological Health</p> <p>Ecological Health Public Health and Societal Well-Being</p> <p>MacLeans Kohler Nation of Eco-Hogs</p> <p>Scalloway Standard of Living and Population Density</p> <p>Scalloway Differences Between Developed and Developing Countries</p> <p>US Census Bureau International Data Base Country Summaries</p> <p>Peter Russell World Clock</p> <p>Scalloway Population Structure</p> <p>India, China’s Resource Consumption on the Rise State of the World Report</p> <p>Global Envision India and China’s Resource Consumption on the Rise</p> <p>New York Times What’s Your Consumption Factor Diamond</p> <p>Global Issues Consumption and Consumerism Shah</p>
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**Unit 2: Sustainable Environment (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence our ability or inability to achieve a sustainable environment.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>2.2 Describe and analyse the interaction of resource management, energy, and recycling, and assess the impact of related initiatives on the sustainability of the environment.</p>	<ul style="list-style-type: none"> <li>• Have learners conduct a critical examination of renewable and non-renewable resources to understand the impact the human population has on these resources.</li>   <li>• Have learners explain the need for balancing the growth in global energy demands with maintaining a viable biosphere and identify technologies to meet this need.</li>   <li>• Have learners describe the nature and types of waste and the effectiveness of waste management initiatives.</li> </ul>

**Unit 2: Sustainable Environment (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence our ability or inability to achieve a sustainable environment.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>
<ul style="list-style-type: none"> <li>- Our demands on renewable and non-renewable resources have long-term and far-reaching implications. In order to understand this dynamic relationship, complete the following four activities.                             <ul style="list-style-type: none"> <li>(a) Create a table with two columns listing as many renewable and non-renewable resources as you can.</li> <li>(b) Choose two resources from both renewable and non-renewable, and research which countries have an abundance of the resource and which countries have shortages of the resource.</li> <li>(c) Watch the documentary <i>A Crude Awakening</i>. Discusses how the world will be affected following the inevitable depletion of oil.</li> <li>(d) Watch the documentary <i>An Inconvenient Truth</i> by Al Gore that looks at the current and future impact of global warming on the earth. What specific advice would you give to a politician regarding the use of renewable and non-renewable resources based on the information supplied in this video.</li> </ul> </li>   <li>- In 2008, Mark Jacobson, from the Department of Civil and Environmental Engineering at Stanford University, compiled a lengthy report regarding the pros and cons associated with a variety of renewable energy options presently available to the world (i.e. solar, tidal, nuclear, wind, ethanol,...). His recommendations were based on an extensive examination of data associated with each of these options. The final report is far too long for our purposes, but his recommendations have been summarized and can be found by googling <i>Worldchanging New Research Ranks Top Renewable Energy Options</i>. Find and read this article. If you were the Prime Minister, how would use this information to inform future policies and programs?</li>   <li>- Choose an alternative power (energy) source and, through research, create a one to two page report based on the following questions:                             <ul style="list-style-type: none"> <li>(a) When and where the power source was initially developed?</li> <li>(b) What are the positive and negative effects of the power source both economically and its effects on the environment?</li> <li>(c) Will Nova Scotia be able to use the power source?</li> <li>(d) Is there a future for the technology you are researching?</li> </ul> </li>   <li>- Conduct one of these field trips and create a PowerPoint of your findings.                             <p>Visit a local recycling plant and find information on the types of material the facility accepts, what happens to the material that is gathered and what the financial rewards are from recycling.</p> <p style="text-align: center;">or</p> <p>Visit a local water treatment facility and gather information on the treatment process, the chemicals used in the treatment and the quality of the water following treatment.</p> </li> </ul>	<p><b>Print Resources:</b> Sustainable Environment Unit (Ingram, Tattrie, and Harvie)</p> <p><b>Online Resources:</b> Worldchanging New Research Ranks Top Renewable Energy Options</p> <p>Eco-Pros When are Renewable Resources not Renewable</p> <p>MIT World Meeting Global Energy Demands Sustainably</p> <p>Millennium Project Global Challenges Energy Demands</p> <p>Environment Canada Waste Management</p> <p>A Living Machine New Internationalist Kelly Redwood</p> <p>YouTube: Edmonton Waste Management Centre</p> <p>YouTube: Nuclear Waste Management Practices</p>



**Unit 2: Sustainable Environment (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence our ability or inability to achieve a sustainable environment.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- There are hundreds of hazardous air pollutants. Benzene (from gasoline), perchlorethylene (formerly used in dry cleaning), and methylene chloride (from paint stripper) are just a few. Use the internet to investigate at least three hazardous air pollutants that you may encounter in your home or at work. Identify the effects of long term exposure to this pollutant. Also identify strategies that would eliminate or minimize your exposure to such pollutants.</li> <li>- Acid Rain Assignment Research and write a report, which addresses the issues detailed below. <ol style="list-style-type: none"> <li>1. Definition of acid rain.</li> <li>2. Explanation of the most common sources of acid rain.</li> <li>3. The effects of acid rain on both the biotic (living) and abiotic (non-living) factors in our Nova Scotian ecosystem, with special focus on the coniferous forests.</li> <li>4. Statistical information on the changes in acid rain levels in Canada (Nova Scotia, specifically, if information is available) in the last 20-40 years.</li> <li>5. Economic impact of acid rain damage on Canadian forests.</li> <li>6. A summary of a case study where the effects of acid rain damage are/have been reversed.</li> <li>7. A proposed plan of action (describe a plan which currently exists, or propose some guidelines for the development of one) for Canada with regards to acid rain.</li> <li>8. Outlook for the future of Canada’s forests with regards to acid rain.</li> <li>9. Develop a vocabulary list (to be included as an appendix to this paper), which includes at least 10 terms/vocabulary words and definitions (in your own words) which relate directly to the topic of acid rain.</li> <li>10. Include at least 5 visuals (graphs, photos, diagrams) in your report, and be sure to cite your sources.</li> </ol> </li> <li>- Using the Canadian Oxford School Atlas, Eighth Edition, answer the following questions: <ol style="list-style-type: none"> <li>(a) Refer to the map Greenhouse Gases at the bottom of page 125 in the Atlas. Study the legend and explain how greenhouse gas emissions are presented on the map.</li> <li>(b) Create two lists. The first list should rank the top seven countries by their total carbon emissions. The second list should rank the top seven countries per capita emissions and should include the data beside the country.</li> <li>(c) Write a brief comparison of the two lists, suggesting any similarities and differences.</li> <li>(d) Refer to the Energy Consumption 2000, map at the bottom of page 138 in the Atlas. Is there any relationship between the high energy consumers on this map and the countries with high greenhouse emissions? Explain your findings.</li> </ol> </li> </ul>	<p><b>Print Resources:</b> Sustainable Environment Unit (Ingram, Tattrie, and Harvie)</p> <p><b>Online Resources:</b> Lestari Pollution and Contamination</p> <p>NCBI Hazards of Heavy Metal Contamination</p> <p>Health Canada Environmental Contaminants</p> <p>Canadian Cancer Society Specific Environmental Contaminants</p> <p>Videojug Mercury and Fish</p> <p>Google Video: Commissioner Frank Avila Speaks Emerging Pollutants</p> <p>ABC News Air Pollutants Inside the Home</p> <p>Howstuffworks Sally Ride on Climate Change</p> <p>Howstuffworks Earth Science: Global Warming</p> <p>Carbon Footprint Calculator Reducing Your Impact</p> <p>Howstuffworks Weather: Reversing Global Warming</p>



**Unit 2: Sustainable Environment (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence our ability or inability to achieve a sustainable environment.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>
<ul style="list-style-type: none"> <li>- When a company that deals with hazardous materials wishes to build a new facility, they are required to submit an Environmental Impact Assessment (EIA). This assessment will examine the proposed practices of the company and the facility’s potential impact to the environment under normal operations and during possible spillages. For example, an EIA for a proposed short-term storage site for asbestos waste in Burnside Industrial Park, Dartmouth, can be found on the following website.  <a href="http://www.gov.ns.ca/nse/ea/asbestosstorageburnside/besldoc.pdf">http://www.gov.ns.ca/nse/ea/asbestosstorageburnside/besldoc.pdf</a>                      (or google <i>Environmental Impact Assessment asbestos burnside</i>)                      Read the report. If you were the owner of the company operating beside the proposed asbestos shortage facility, would you support or oppose the proposal? Justify your position.</li>   <li>- Fish farming occurs on both the east and west coast of Canada. The controversial fish farming practice that is commonly used is called open-net-cage fish farming. Go to following websites and view the material.  <a href="http://www.davidsuzuki.org/Oceans/Aquaculture/Salmon/">http://www.davidsuzuki.org/Oceans/Aquaculture/Salmon/</a>                      (or google <i>David Suzuki Foundation Open-net-cage Fish Farming</i>)  <a href="http://www.youtube.com/watch?v=FvTZ3x61kFk">http://www.youtube.com/watch?v=FvTZ3x61kFk</a>                      (or go to YouTube and find <i>Salmon, sea lice and science</i>)                      Suppose you were a citizen in a coastal community where an individual wishes to build a salmon farm. Would you support the proposal, advocate for closed containment system, or reject any type of salmon farm. Justify your position.</li>   <li>- Do you think that people in North America have made a fundamental shift in their attitudes towards the environment? Are they interested in achieving a sustainable environment? Are they taking action? If so, what type of actions are they taking? Are our politicians taking action? Do you feel that we are making progress? Do you have concerns?</li>   <li>- Visit the Suzuki foundation’s website (<a href="http://www.davidsuzuki.org/">http://www.davidsuzuki.org/</a>) and explore some of the ways you can aid in creating a sustainable environment. Create a personal plan that reduces your impact on the environment and works towards sustainability. Feel free to find other sources of information as well and be sure to cite them. Your plan should include actions you may take to improve and/or conserve the following:                         <ul style="list-style-type: none"> <li>• Water</li> <li>• Non-renewable resources</li> <li>• Renewable resources</li> <li>• Air quality</li> <li>• Reduction of the greenhouse effect</li> <li>• Reduction of acid rain</li> </ul> </li> </ul>	<p><b>Print Resources:</b>                      Sustainable Environment Unit                      (Ingram, Tattrie, and Harvie)</p> <p><b>Online Resources:</b>                      TED Majora Carter                      Sustainable Living</p> <p>TED Alex Steffen Sees a                      Sustainable Future</p> <p>TED Al Gore on Averting                      Climate Crisis</p> <p>TED Ray Anderson on the                      Business Logic of                      Sustainability</p> <p>David Suzuki Foundation</p> <p>Power Scorecard Twenty                      Things You Can Do to                      Conserve Energy</p> <p>Environmental Impact                      Assessment Asbestos Burnside</p> <p>David Suzuki Foundation                      Open-net-cage Fish Farming</p> <p>YouTube: Salmon, Sea Lice                      and Science</p>



**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>
<p>- Activity: Longevity Game: How long will you live for? Your lifespan is determined not only by genetics, but greatly affected by your lifestyle habits. To determine when you will “kick the bucket”, go to the following website and play the game. <a href="http://www.nmfn.com/tn/learnctr--lifeevents--longevity">http://www.nmfn.com/tn/learnctr--lifeevents--longevity</a> (or google <i>Northwestern Mutual Longevity Game</i>)</p> <p>- Activity:Lifestyle Habits This test will assess your lifestyle habits and let you know what your <i>real age</i> is. Even though you are 35, all of the good or bad habits that you have may help you and make you 24 or may hurt you make you 80! All of our habits affect the way we age. Go to the following website: <a href="http://www.realage.com/ct/my-realage/">http://www.realage.com/ct/my-realage/</a> (or google <i>My RealAge Page</i>) Find out your real age. Print off your action plan and write down, in point form, the steps you need to take to become healthier.</p> <p>- The wellness wheel demonstrates how the six dimensions of wellness (social, physical, emotional, intellectual, spiritual, and occupational) come together to promote a more complete well-being. Go to the following website to work with the wheel. <a href="http://www.sa.usf.edu/wellness/about/wheel.htm">http://www.sa.usf.edu/wellness/about/wheel.htm</a> (or google <i>University of South Florida Wellness Wheel</i>) Click on each component. There you will find the answers to the following questions. (a) In your own words, describe what each dimension of health is and give examples of how you incorporate it into your own life. (b) After describing each, do you think a person could be physically fit and yet still be unhealthy? Explain.</p>	<p><b>Print Resources:</b> An Invitation to Health (Hales and Lauzon)  Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</p> <p><b>Online Resources:</b> Human Resources and Skills Development Canada Life Expectancy at Birth  School for Champions Lifestyle Factors Affecting Quality of Life in Late Adulthood  Definition of Wellness Definition of Dimensions  The Dimensions of Wellness How Am I Doing  MHHE Wellness Worksheet 1  YouTube: The Wellness Concept  ABC News Wellness Quiz Test Your Health IQ  Howstuffworks Dr. Whyte Four Numbers You Need to Know</p>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>3.2 Summarize the key components of a safe personal fitness program while also identifying proper exercise frequency, intensity and duration.</p>	<ul style="list-style-type: none"> <li>• Have learners recognize the benefits of physical activity, including improved cardiovascular efficiency, skeletal mass, weight control, life span, and mental health.</li>   <li>• Have learners assess their cardiorespiratory endurance, muscular strength and endurance, flexibility and body composition with the goal of designing a personal fitness program.</li>   <li>• Have learners define body mass index and describe different methods of estimating body composition.</li>   <li>• Have learners identify means of improving the chances of maintaining a physical fitness program.</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>
<ul style="list-style-type: none"> <li>- <i>Assignment: Overall Importance of Physical Activity</i> From <i>An Invitation to Health: Second Canadian Edition</i>, read pages 73 to 81, and 130 to 131. Answer the following questions.                             <ul style="list-style-type: none"> <li>(a) What is physical activity?</li> <li>(b) What are the benefits of regular physical activity (at least 9)?</li> <li>(c) What is physical fitness?</li> <li>(d) Describe the 4 health-related components of physical fitness and their benefits to our overall physical health.</li> <li>(e) Health Canada has replaced ideal-weight tables with a weight classification system that includes 4 types of calculations. Describe each.</li> </ul> </li> <li>- Go the following website titled <i>Guide for Older Adults</i>, click on <i>Why I Should be Active</i>, and answer the following questions. <a href="http://www.phac-aspc.gc.ca/pau-uap/paguide/older/index.html">http://www.phac-aspc.gc.ca/pau-uap/paguide/older/index.html</a> (or google <i>Guide for Older Adults Why I Should be Active</i>)                             <ul style="list-style-type: none"> <li>(a) List the 7 facts about physical activity.</li> <li>(b) Now click on “Physical Activity Guide”. In this section, they have listed the benefits of regular exercise. What are they?</li> <li>(c) They have a list of risk reduction. What does regular exercise reduce the risk of?</li> </ul> </li> <li>- Use Canada’s Physical Activity Guide to design a 6 to 8 week individualized physical activity program. Complete this activity program. Maintain a journal during the period. Suggestions:                             <ul style="list-style-type: none"> <li>Obtain some simple equipment (stability balls, resistance bands, etc.) and set up a training circuit.</li> <li>Have a class set of pedometers and set up a walking program.</li> <li>Organize a program with your local YMCA or gym.</li> </ul> </li> <li>- Go to the following website, calculate, and define each of the following. <a href="http://www.healthfitness.com.au/calculators/calculate_fitness.html">http://www.healthfitness.com.au/calculators/calculate_fitness.html</a> (or google <i>health fitness calculators body mass heart caloric muscle fiber</i>)                             <ul style="list-style-type: none"> <li>(a) BMI</li> <li>(b) Waist-to-Hip Ratio</li> </ul>                             Use the following equipment to analyze the above measurements (body fat analyzer, heart rate monitors, blood pressure monitor).                             <ul style="list-style-type: none"> <li>- Maintain a journal reflecting on changes noticed during the above activities.</li> <li>- Complete the Behavior Change Contract.</li> </ul> </li> </ul>	<p><b>Print Resources:</b></p> <ul style="list-style-type: none"> <li>An Invitation to Health (Hales and Lauzon)</li> <li>Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</li> </ul> <p><b>Online Resources:</b></p> <ul style="list-style-type: none"> <li>Public Health Agency of Canada Physical Activity Guide Downloads</li> <li>Health Canada Healthy Living Physical Activity</li> <li>Hoptechno Fitness Fundamentals</li> <li>Public Health Agency of Canada The Benefits of Physical Activity</li> <li>Preventous Benefits of Physical Fitness</li> <li>Howstuffworks Investigating Human Biology The Importance of Exercise</li> <li>Howstuffworks Managing Your Health Weight Control</li> <li>CBC News In Depth Adult Body Mass Index</li> <li>Health Canada Guidelines for Body Weight Classification in Adults</li> <li>Statistics Canada Adult Body Mass Index Fact Sheet</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>3.3 Make inferences regarding the impact of nutrition on body function. (Continued on the next few pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners demonstrate an understanding of food components (water, proteins, carbohydrates, fibre, fats, vitamins, and minerals) and their effects on body functions.</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>																		
<p>- <b>Assignment: Essential Nutrients</b>                      There are certain nutrients that are essential to our body’s everyday functioning. These are known as essential nutrients. In the book <i>An Invitation to Health, Second Edition</i>, read pages 100-107 and answer the following questions.                      (a) What does the term “Nutrition” mean?                      (b) What are the 6 classes of “Essential Nutrients” that are important to our overall health? Describe what they are. Describe their function within our bodies. List what foods they are found in.</p> <p>- Read the material found at the following website.  <a href="http://www.nutristrategy.com/nutritioninfo2.htm">http://www.nutristrategy.com/nutritioninfo2.htm</a>                      (or google <i>NutriStrategy Nutrients Vitamins Minerals Dietary Information</i>)                      (a) What are the two types of cholesterol? Are they both harmful to you? Explain.                      (b) Complete the following table for the following vitamins and minerals. What is each needed for by the body and what is the source of the vitamin or mineral?</p> <table border="1"> <thead> <tr> <th></th> <th>Need</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>Vitamin C</td> <td></td> <td></td> </tr> <tr> <td>Vitamin D</td> <td></td> <td></td> </tr> <tr> <td>Vitamin K</td> <td></td> <td></td> </tr> <tr> <td>Iron</td> <td></td> <td></td> </tr> <tr> <td>Manganese</td> <td></td> <td></td> </tr> </tbody> </table> <p>- The Discovery Channel produced a video called <i>Quest for Nutrition</i> that can be found at the following site.  <a href="http://video.google.ca/videoplay?docid=-2918532031358196867&amp;ei=SQwLSojeLJCWrQL_ktU2&amp;q=quest+for+nutrition&amp;hl=en">http://video.google.ca/videoplay?docid=-2918532031358196867&amp;ei=SQwLSojeLJCWrQL_ktU2&amp;q=quest+for+nutrition&amp;hl=en</a>                      (or google video <i>Quest for Nutrition</i>)                      The video looks at the history of nutritional science, the present research, and the direction future research may take. Answer the following questions while viewing the video.                      (a) Several scientists, who were earlier contributors to the field of nutritional science, were mentioned in the video. In one or two sentences briefly describe the contributions of the following individuals to nutritional science.                      Simopoulos Rehnborg Funk Eijkman Hippocrates Lind Liebig                      (b) What is a free radical? What does it do? How are we trying to diminish the effects of free radicals?                      (c) What is the new frontier in nutritional science? What do scientists hope to accomplish by exploring this new frontier?                      (d) What is your opinion of nutritional supplements?</p>		Need	Source	Vitamin C			Vitamin D			Vitamin K			Iron			Manganese			<p><b>Print Resources:</b>                      An Invitation to Health (Hales and Lauzon)                       Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</p> <p><b>Online Resources:</b>                      Nutritionizing Food Nutrition Components                       CDC Nutrition for Everyone Introduction                       Purchon A Balanced Diet                       Centralhome Carbohydrates Friend or Foe                       Howstuffworks Dr. Whyte Vitamins                       Howstuffworks Eating for Your Future Fiber and the American Diet                       CBC News In Depth Banning Bad Fat                       CBC News In Depth Omega-3 Fatty Acids Your Heart Loves                       NutriStrategy Nutrients Vitamins Minerals Dietary Information                       Google Video: Quest for Nutrition</p>
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**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>3.3 Make inferences regarding the impact of nutrition on body function. (Continued from the previous pages and continued on the next few pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners describe a sound nutritional plan based on Canada’s Food Guide and other sources.</li>   <li>• Have learners explain how to interpret the nutritional information provided on food labels.</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <p>- <i>Assignment: Canada's Food Guide</i> Go to the following website, click on <i>Food Guide Basics</i>, and answer the following questions. <a href="http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php">http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php</a> (or google <i>Health Canada Food Guide</i>)</p> <ol style="list-style-type: none"> <li>What are the four basic food groups? Is there a fifth group?</li> <li>Give an example of one serving in each group.</li> <li>How many servings from each group do you need per day</li> <li>Click on the "Make Wise Choices" section. Give examples of how you can make wise choices for eating foods from each food group.</li> <li>Go to the "Current Subject" section on the left hand side and then click on "Maintaining Healthy Habits". List foods that we should limit. List healthy alternatives to these foods.</li> <li>You are now ready to create your own food guide. Click on "My Food Guide" and make your own! Print a copy.</li> </ol> <p>- <i>Assignment: Interpreting Nutrition Labels</i> Reading labels is far more important than comparing prices to save money. By reading labels you may save much more than dollars and cents. You may save yourself a lot of unnecessary pain and suffering and help yourself reduce your risk for ailments by making smart nutritional decisions based on reading and understanding labels properly. Using the label from a food of your choice, complete the following information. The label must list nutrient information in order to complete this assignment. Check page 111 in <i>Invitation to Health, Second Edition</i>.</p> <p><b>PART I: Food Label Information</b></p> <ol style="list-style-type: none"> <li>Supply the name of product you are evaluating. Include the nutritional label.</li> <li>What is the predominant ingredient by weight?</li> <li>What is the serving size?</li> <li>What is the total number of servings per container? Is the serving size a portion that you would normally consume in one meal? If not, what serving size of this product would you consume in one meal?</li> <li>Is the product fortified or enriched?</li> <li>Are any nutritional claims ("low", "reduced", "good source",...) made on the packaging? Is this claim supported by the information on the food label?</li> <li>What health claims, if any, are made about this product?</li> </ol> <p><b>PART II: Percent of Calories from Fat, Carbohydrate and Protein</b></p> <ol style="list-style-type: none"> <li>Using the label information state the number of grams of carbohydrate per serving, grams of protein per serving, and grams of fat per serving.</li> <li>Calculate the total calories per serving.</li> <li>Calculate the percentage of calories from each of the nutrients in one serving of the food.</li> <li>Did any of this information surprise you? If so, how were you surprised?</li> <li>Did the label make any claims about the percentage of any nutrient that were contradicted by your calculations? (For example, if you used a lunch meat that claimed to be 97% fat-free, were just 3% of its calories provided by fat?) If the manufacturer made such claims, how do you explain the difference between the manufacturer's claims and your findings?</li> </ol>	<p><b>Print Resources:</b> An Invitation to Health (Hales and Lauzon)</p> <p>Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</p> <p><b>Online Resources:</b> Health Canada Food Guide</p> <p>Centralhome Re-Shape Your Diet</p> <p>Health Canada Food Labels</p> <p>Government of Alberta Food Labels Understanding the Language</p> <p>CBC News Food Labels The Facts About What's in Your Food</p> <p>Dietfacts Nutrition Facts for Restaurants</p> <p>Dietitians of Canada Recipe Analyzer</p>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>3.3 Make inferences regarding the impact of nutrition on body function. (Continued from the previous pages and continued on the next few pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners assess the need for greater communication and understanding of nutritional information for the general public.</li>   <li>• Have learners evaluate the nutritional value of their personal diet.</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>																																												
<p>- Canadian doctors have been pressing the government to require chain restaurants and school cafeterias to post the calorie counts on their menus. Is any company already supplying this information or any other nutritional information? Is it supplied directly on the menu? Do you feel that they should be required to supply this information?</p> <p>- <i>Assignment: Diet Assessment</i>                      In this assignment you will assess your present diet. Go to the following websites:  <a href="http://www.dietitians.ca/public/content/eat_well_live_well/english/eatracker/#">http://www.dietitians.ca/public/content/eat_well_live_well/english/eatracker/#</a>                      (or google <i>Dietitians of Canada Eatracker</i>)  <a href="http://www.fitday.com">http://www.fitday.com</a>                      (or google <i>Fitday</i>)  <a href="http://www.nat.uiuc.edu/mainnat.html">http://www.nat.uiuc.edu/mainnat.html</a>                      (or google <i>NAT Nutrition Analysis Tool</i>)                      (a) Take the assessment.                      (b) Track your food for a three day period.                      (c) Analyze your dietary intake. Are you getting the recommended nutrient values?                      (d) Create your own daily meal plan that will help you get your recommended daily intakes. You will plan meals for a week. Do this by clicking on the “<i>Let’s make a meal</i>” section on this website. You will need to print these meal plans</p> <p>- <i>Assignment: Measuring the Fat, Sugar, and Salt in your Favorite Foods</i>                      Do you really know how much fat, salt and sugar you are eating? You are going to read the nutritional label on the three of your favorite snacks and converting these readings into numbers that we can see and touch on a paper plate.</p> <p><b>Task #1</b>                      Think about ways in which fat, sodium and sugar can affect your health. Fill in the following chart.</p> <table border="1"> <thead> <tr> <th></th> <th><i>Recommended Daily Amount</i></th> <th><i>What are most Canadians consuming daily</i></th> <th><i>Effects to our health</i></th> </tr> </thead> <tbody> <tr> <td><i>Fats</i></td> <td></td> <td></td> <td></td> </tr> <tr> <td><i>Sugar</i></td> <td></td> <td></td> <td></td> </tr> <tr> <td><i>Salt</i></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><b>Task #2: Performing the activity/experiment</b>                      You are to take in your favorite food(s) and assess just how much fat, salt and sugar you are really consuming. You will record these numbers in the following chart and place the measured amount on a piece of construction paper.</p> <table border="1"> <thead> <tr> <th><b>Food</b></th> <th><b>Fat (g)</b></th> <th><b>Lard (tsp)</b></th> <th><b>Sugar (g)</b></th> <th><b>Sugar (tsp)</b></th> <th><b>Salt (mg)</b></th> <th><b>Salt (tsp)</b></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>After you have done this with your own foods, we will take pictures of each and you can place them on your sheet. Were you shocked at the amount of fat, sugar and salt in the foods that you consume on a regular basis?</p>		<i>Recommended Daily Amount</i>	<i>What are most Canadians consuming daily</i>	<i>Effects to our health</i>	<i>Fats</i>				<i>Sugar</i>				<i>Salt</i>				<b>Food</b>	<b>Fat (g)</b>	<b>Lard (tsp)</b>	<b>Sugar (g)</b>	<b>Sugar (tsp)</b>	<b>Salt (mg)</b>	<b>Salt (tsp)</b>																						<p><b>Print Resources:</b>                      An Invitation to Health (Hales and Lauzon)                       Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</p> <p><b>Online Resources:</b>                      CTV News Ontario Doctors Urge for Calorie Information on Menus                       Canadian Food Inspection Agency Labelling                       Organic Consumers Association Debate Erupts After Canada Parliament Votes Against GE Food Labels                       TED Ann Cooper Talks School Lunches                       TED Mark Bittman on What's Wrong with What We Eat                       YouTube: Bill Mahar Rant on Food Nutrition                       Centralhome Eating Out the Healthy Way                       CBS News Debunking Nutrition Myths                       Videojug Dietary Supplements                       Howstuffworks Eating for Your Future A Balanced Diet                       Dietitians of Canada Eatracker                       Fitday                       NAT Nutrition Analysis Tool</p>
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**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>3.3 Make inferences regarding the impact of nutrition on body function. (Continued from the previous pages and continued on the next few pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners investigate a different type of diet and discuss possible health benefits and risks.</li>   <li>• Have learners describe the relationship between diet and disease.</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>
<p>- In the book <i>An Invitation to Health, Second Edition</i> read pages 117-120 “The Way We Eat.” Research a country of your choice in terms of its nutrition. (How healthy is the country in terms of dietary illnesses like obesity or malnutrition? What foods do they enjoy eating? What is the eating schedule like? Do they grow their own foods, etc.)</p> <p>- In the book <i>An Invitation to Health, Second Edition</i> read page 143 “Avoid Diet Traps.” Research a “fad diet” of your choice (examples: Adkins Diet, Slim Fast, etc.). What does the diet entail (what does the person on the diet have to eat, not eat, etc.)? Are their studies that have shown that it works? Do you think that the diet is safe in terms of healthy nutrition habits you’ve learned about?</p> <p>- <i>Assignment: Lifestyle and Disease: What’s your Risk?</i> Living a healthy lifestyle may help slow the progression or maybe even prevent certain diseases from occurring. In this assignment, you explore diseases that have a strong connection with our lifestyle.</p> <p><b>Part A</b> You are to find out what your risk of all five diseases is. Go to the following website: <a href="http://www.yourdiseaserisk.wustl.edu/">http://www.yourdiseaserisk.wustl.edu/</a> ( or google <i>Siteman Cancer Center Your Disease Risk</i>) Click on each disease to determine your risk of getting the disease. When you are finished with each one, you are to print out the results and attach to the module.</p> <p><b>Part B</b> When you are finished doing this, you are to research one of the 5 diseases (cancer, diabetes, heart disease, osteoporosis, or stroke) Your job is to explain:</p> <ul style="list-style-type: none"> <li>• what each disease is</li> <li>• symptoms</li> <li>• causes</li> <li>• risk factors</li> <li>• Any nutritional or physical ways to prevent the disease from occurring</li> <li>• If you were at risk for this disease, how would you change your lifestyle to help ease the symptoms of the disease?</li> </ul> <p>- <i>Assignment: The Wonderful World of Nutrition: How we Eat, What We Eat &amp; It’s Impact on our Bodies</i> In the book <i>An Invitation to Health, Second Edition</i> please read pages 135-137 “Eating Disorders.” Research a nutritional disease (examples: bulimia, anorexia, obesity, Kwashiorkor, Malnutrition, Botulism, etc.) Describe the disease, symptoms, describe the people who get it, treatment, and any other interesting facts that you find about the disease.</p>	<p><b>Print Resources:</b> An Invitation to Health (Hales and Lauzon)  Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</p> <p><b>Online Resources:</b> Government of Alberta Fad Diets Too Good to Be True  CBC News Weight Loss Does Dieting Make You Fat  The Truth About High Protein Low Carbohydrate Diets  CBC News U.S. Warns Against Diet Pills Sold Online  Seekwellness Nutrition and Disease  YouTube: Nutrition Gut and Cancer  Howstuffworks Body Invaders Nutrients and Diet  Howstuffworks Controlling Your Cholesterol Part of a Healthy Life  Siteman Cancer Center Your Disease Risk  Google Video: Dr Russell Blaylock Nutrition and Behavior  Healthcastle Nutrition &amp; Heart Disease</p>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>3.3 Make inferences regarding the impact of nutrition on body function. (Continued from the previous pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners explain some food safety concerns and misconceptions of which consumers should be aware.</li> </ul>

**Unit 3: Physical Lifestyle and Nutrition (Required Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that influence health and wellness through the examination of research and reflection of their own lifestyle choices.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <p>- <i>Assignment: Food Additives</i> Your task is to do research about food additives. Use the following websites and any others that you may find that come from reliable sources (government, science journals, etc).</p> <p><a href="http://www.hc-sc.gc.ca/fn-an/securit/addit/index-eng.php">http://www.hc-sc.gc.ca/fn-an/securit/addit/index-eng.php</a> (or google <i>Health Canada Food Additive</i>)</p> <p><a href="http://www.cbc.ca/news/background/foodsafety/additives.html">http://www.cbc.ca/news/background/foodsafety/additives.html</a> (or google <i>CBC News Food Additives</i>)</p> <p><a href="http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070905/food_colouring_070905?s_name=&amp;no_ads=">http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070905/food_colouring_070905?s_name=&amp;no_ads=</a> (or google <i>CTV News Food Additives Appear to Increase Hyperactivity</i>)</p> <p><a href="http://www.cspinet.org/reports/chemcuisine.htm">http://www.cspinet.org/reports/chemcuisine.htm</a> (or google <i>CSPI Food Additives</i>)</p> <p>(a) What are food additives and why are they used? (b) Discuss 5 food additives that are harmful to the human body.</p> <p>- <i>Assignment: Food Handling</i> Go to the following website: <a href="http://www.canfightbac.org/en/">http://www.canfightbac.org/en/</a> (or google <i>Canadian Partnership for Consumer Food Safety Education</i>) . Answer the following questions.</p> <p>(1) What is a food-borne illness? (2) Describe the 4 rules to follow when handling food? (3) Research the recent listeriosis scare in Canada. The following websites will help.</p> <p><a href="http://www.cbc.ca/consumer/story/2008/08/21/f-listeria-faqs.html">http://www.cbc.ca/consumer/story/2008/08/21/f-listeria-faqs.html</a> (or google <i>CBC News Listeria FAQs</i>)</p> <p><a href="http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/food-aliment/listeria-eng.php">http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/food-aliment/listeria-eng.php</a> (or google <i>Health Canada Listeria Food Safety</i>)</p> <p><a href="http://www.cbc.ca/consumer/story/2008/08/22/listeria.html?ref=rss">http://www.cbc.ca/consumer/story/2008/08/22/listeria.html?ref=rss</a> (or google <i>CBC News Death of B.C. Man Linked to Listeria Outbreak</i>)</p> <p><a href="http://www.cbc.ca/canada/story/2008/08/24/health-listeria.html">http://www.cbc.ca/canada/story/2008/08/24/health-listeria.html</a> (or google <i>CBC News More Listeriosis Cases Expected Recall</i>)</p> <p><a href="http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20080820/mlf_recall_080820/20080820?hub=Canada">http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20080820/mlf_recall_080820/20080820?hub=Canada</a> (or google <i>CTV News Ontario Death Confirmed in Listeriosis Outbreak</i>)</p> <p>(i) What is listeriosis? (ii) What are the symptoms of it? (iii) What caused the outbreak? (iv) How did Maple Leaf respond to the outbreak? (v) What did they do to clean up the factory? (vi) What will they do to prevent this from happening again?</p>	<p><b>Print Resources:</b> An Invitation to Health (Hales and Lauzon)</p> <p>Physical Lifestyles and Nutrition Unit (Marchand and Rutledge)</p> <p><b>Online Resources:</b> Health Canada Food Additive</p> <p>Health Canada Listeria Food Safety</p> <p>Canadian Food Inspection Agency</p> <p>Health Canada Genetically Modified Foods</p> <p>CBC News Genetically Modified Foods A Primer</p> <p>CBC News Food Safety</p> <p>CBC News Food Additives Explained</p> <p>CBC News More Child Deaths Linked to China's Melamine Scandal</p> <p>The China Post Melamine Scare Escalates</p> <p>Nova Scotia Food Establishment Inspection Reports</p> <p>Canadian Partnership for Consumer Food Safety Education</p>

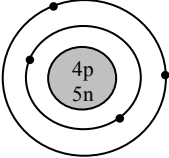
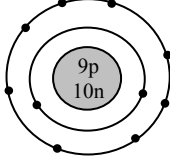
**Unit 4: Chemistry (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of elements, compounds, and chemical reactions, and apply this knowledge to the safe handling of chemicals.

<b>Outcomes</b> <i>Learners will be expected to</i>	<b>Elaborations</b>
4.1 Investigate the physical and chemical properties of elements and compounds.	<ul style="list-style-type: none"> <li>• Have learners describe the atomic structure of common elements and relate the properties of the elements to their location in the periodic table.</li>   <li>• Have learners describe how elements combine and form compounds and in the process learn how to name and write formulae for common ionic compounds (including those composed of multivalent elements and polyatomic ions) and molecular compounds.</li>   <li>• Have learners identify simple acids and bases, their pH and their effects on the environment.</li> </ul>

**Unit 4: Chemistry (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of elements, compounds, and chemical reactions, and apply this knowledge to the safe handling of chemicals.

<b>Suggested Teaching and Evaluation Items</b> <i>Learners will be expected to solve the following types of problems.</i>	<b>Resources/Notes</b>
<ul style="list-style-type: none"> <li>- On the right you have been provided with Bohr models for two different atoms or ions. Answer the following questions for each of models separately.               <div style="display: flex; justify-content: space-around; align-items: center; margin: 10px 0;">   </div> <ol style="list-style-type: none"> <li>(a) Are you dealing with an atom or an ion? How did you determine this?</li> <li>(b) What is the atomic number?</li> <li>(c) What is the mass number?</li> <li>(d) State the charge.</li> <li>(e) Are we dealing with a metal or nonmetal?</li> <li>(f) Name the atom or ion.</li> </ol> </li> <li>- Given the isotope symbol <math>{}_{92}^{238}\text{U}</math>, determine the isotope name, the number of protons, the number of neutrons, and the number of electrons.</li> <li>- To introduce the periodic table and its organization of elements, have learners complete the <i>Develop Your Skills</i> activity found on page 11 of <i>Nova Scotia Science AE Chemistry</i>.</li> <li>- Circle the options that make this statement correct. Alkali metals tend to (gain or lose) one electron to form (1+ or 1-) ions.</li> <li>- In one episode of the original Star Trek television series, Kirk, Spock and Bones encountered the Horta, a silicon-based life form. Using your knowledge of the periodic table, explain how the writers of this episode came up with the idea of a silicon-based life form. What do scientists currently think about the possibility of silicon-based life? To answer this last question google the online resources <i>NASA Astrobiology Institute Silicon Based Life</i> and <i>Daviddarling Silicon Based Life</i>.</li> <li>- Explain why the number of electrons in the outermost shell can predict an element's reactivity.</li> <li>- Name the following ionic compounds: <math>\text{MgF}_2</math>, <math>\text{MnS}_2</math>, <math>\text{Na}_2\text{SO}_4</math></li> <li>- Write the formulas for the following ionic compounds.               <ol style="list-style-type: none"> <li>(a) aluminum oxide</li> <li>(b) tin(II) nitride</li> <li>(c) strontium chlorate</li> </ol> </li> <li>- Name the molecular compound <math>\text{N}_2\text{O}_4</math>.</li> <li>- Write the formula for the molecular compound dinitrogen tetrasulphide.</li> <li>- Learners should examine and compare chemical and physical properties of ionic compounds with those of molecular compounds.</li> <li>- Using litmus paper, have learners explore the pH of common household items and label them as acids or bases.</li> </ul>	<p><b>Print Resources:</b></p> <p>Nova Scotia Science AE Chemistry (Edvantage Publishing)</p> <p>Science Workshop Series; Atoms and Elements (Rosen)</p> <p>Science Workshop Series; Reactions (Rosen)</p> <p>Science Workshop Series; Mixtures and Solutions (Rosen)</p> <p><b>Online Resources:</b></p> <p>Howstuffworks Assignment Discovery Electron Shells</p> <p>Chemguide Atomic Orbitals</p> <p>5min Electrons Orbitals and Electron Shells</p> <p>Yahoo Video Electron Configuration</p> <p>YouTube: Junior Chemistry The Periodic Table 1</p> <p>YouTube: Chemistry Music Video Elemental Funkiness</p> <p>Chemicool Periodic Table</p> <p>YouTube: Ionic and Covalent Bonding Animation</p> <p>Slideshare 4-6 Naming Ionic Compounds</p> <p>Aspenview Naming Chemical Compounds</p> <p>Saskworkguide Investigate Chemical Reactions Involving Acids and Bases</p>



**Unit 4: Chemistry (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of elements, compounds, and chemical reactions, and apply this knowledge to the safe handling of chemicals.

<b>Suggested Teaching and Evaluation Items</b> <i>Learners will be expected to solve the following types of problems.</i>	<b>Resources/Notes</b>
<ul style="list-style-type: none"> <li>- Learners should observe a variety of physical and chemical changes among common substances (e.g. steel wool placed in copper (II) sulfate solution, oxidation of iron, ice melting, Alka-Seltzer tablet added to water, combustion of wax, vinegar added to milk, cutting of paper, toasting of bread, vinegar added to baking soda, a match burning, leaves changing colour in the fall, phenolphthalein added to sodium hydroxide, composting of organic waste, decomposition of hydrogen peroxide). Learners should describe the properties of each substance before and after the change and look for indicators that could provide evidence that a chemical reaction has occurred rather than a physical change.</li> <li>- Have learners complete a conservation of mass experiment. You may wish to consider the experiments found by googling <i>eHow How to Apply the Law of Conservation of Mass</i> or <i>Tuckahoe Conservation of Mass PDF</i>.</li> <li>- Balance the following skeleton equations.               <ul style="list-style-type: none"> <li>(a) <math>\text{Mn} + \text{I}_2 \rightarrow \text{MnI}_4</math></li> <li>(b) <math>\text{K}_2\text{SO}_4 + \text{AgNO}_3 \rightarrow \text{Ag}_2\text{SO}_4 + \text{KNO}_3</math></li> </ul> </li> <li>- Write a balanced formula equation for each word equation               <ul style="list-style-type: none"> <li>(a) sodium hydroxide + barium sulphide <math>\rightarrow</math> sodium sulphide + barium hydroxide</li> <li>(b) hydrogen fluoride + aluminum hydroxide <math>\rightarrow</math> aluminum fluoride + water</li> </ul> </li> <li>- Identify the type of reaction (synthesis, decomposition, single replacement, double replacement or acid-base neutralization) for each of the balanced chemical equations.               <ul style="list-style-type: none"> <li>(a) <math>\text{F}_2 + 2\text{NaI} \rightarrow \text{I}_2 + 2\text{NaF}</math></li> <li>(b) <math>3\text{F}_2 + 2\text{Al} \rightarrow 2\text{AlF}_3</math></li> <li>(c) <math>\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}</math></li> <li>(d) <math>2\text{HF} \rightarrow \text{H}_2 + \text{F}_2</math></li> </ul> </li> </ul>	<p><b>Print Resources:</b>            Nova Scotia Science AE Chemistry (Edvantage Publishing)</p> <p>Science Workshop Series; Reactions (Rosen)</p> <p><b>Online Resources:</b>            YouTube: Five Common Chemical Reactions</p> <p>Chemistry Daily Chemical Reaction</p> <p>Cerlabs Observing Signs of Chemical Reaction PDF</p> <p>Mr Guch How Can I Balance an Equation</p> <p>YouTube: Balancing Equations Part 1</p> <p>YouTube: Balancing Equations Part 2</p> <p>eHow How to Apply the Law of Conservation of Mass</p> <p>Tuckahoe Conservation of Mass PDF</p>



**Unit 4: Chemistry (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of elements, compounds, and chemical reactions, and apply this knowledge to the safe handling of chemicals.

Suggested Teaching and Evaluation Items	Resources/Notes
<p><i>Learners will be expected to solve the following types of problems.</i></p> <p>- Match each WHMIS symbol with the appropriate description.</p> <p>___ Compressed Gas (i)</p> <p>___ Flammable and Combustible Material (ii)</p> <p>___ Oxidizing Materials (iii)</p> <p>___ Poisonous and Infectious Material (material causing immediate and serious effects) (iv)</p> <p>- You have just started a new job and on your first day you are asked to work with a paint stripper that has the following WHMIS label.</p> <p>(a) If you do not have WHMIS training and certification, should your employer be asking you to work with this material?</p> <p>(b) What safety precautions should one take when using this product?</p> <p>(c) If someone required more detailed information than is provided on the WHMIS label, where could that information be found?</p> <p>- A significant number of learners who complete the ALP program continue on into core college programs. If you chose to follow this path, what program would you be interested in taking? Investigate the type of chemical hazards you might be exposed to by following that career path.</p> <p>- What are the responsibilities of the employer if his/her employees are working with hazardous chemical?</p> <p>- Phosphate is used in cleaning detergents. What problem does it pose to the environment? What have Canadian governments done and continue to do in an attempt to correct this environmental problem?</p> <p>- Synthetic estrogen is entering our waterways. Where does it come from and what effect does it have on aquatic populations?</p> <p>- Go to the website <a href="http://www.dhmo.org/">http://www.dhmo.org/</a> and read about Dihydrogen Monoxide.</p> <p>(a) What is DHMO, what is it used for, and what hazards are associated with it?</p> <p>(b) Based on your knowledge of molecular compounds, write the chemical formula for dihydrogen monoxide.</p> <p>(c) Should DHMO be banned? You may wish to access the online site <i>Chemistry Daily Dihydrogen Monoxide</i>.</p>	<p><b>Print Resources:</b></p> <p>Nova Scotia Science AE Chemistry (Edvantage Publishing)</p> <p><b>Online Resources:</b></p> <p>NSCC WHMIS Information from the Tutorials</p> <p>HRSBSTAFF WHMIS Regulations Nova Scotia PPT</p> <p>CLCA WHMIS Responsibilities of the Employer</p> <p>HRSB Interpretation Guide for Nova Scotia's WHMIS Regulations PDF</p> <p>CBC Digital Archives Dishing the Dirt on Phosphate 1970</p> <p>CBC News Canada Moves to Cut Phosphates to Fight Algae Problem</p> <p>NewsInferno Phosphate Ban Gains Steam in Canada</p> <p>Heath Canada Effects of Synthetic Estrogen on Aquatic Populations</p> <p>Science Daily Chemicals in our Water are Affecting Human and Aquatic Life</p> <p>Health Canada Chemical Hazards</p> <p>Dhmo.org</p> <p>Chemistry Daily Dihydrogen Monoxide</p>



**Unit 5: Psychology (Optional Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that affect mental health and distinguish among common psychological disorders.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>5.1 Identify the characteristics of emotional, mental and spiritual health. (Continued on the next few pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners examine the relationship of needs, values, self-esteem, and a sense of control to emotional, mental and spiritual health.</li> </ul>

**Unit 5: Psychology (Optional Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that affect mental health and distinguish among common psychological disorders.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>																						
<p>- Read pages 46-66 in <i>An Invitation to Health, Second Edition</i> and answer the following questions.</p> <ul style="list-style-type: none"> <li>(a) Define in your own words emotional health, mental health and spiritual health.</li> <li>(b) Describe how they are related to each other.</li> <li>(c) Describe how self esteem affects psychological wellness. Suggest three ways we can increase our self esteem.</li> <li>(d) Define altruism. How does altruism enhance our psychological wellness?</li> </ul> <p>- Self-efficacy is described as feeling in control of our own lives with a belief that we can perform novel or difficult tasks, or cope with adversity.</p> <ul style="list-style-type: none"> <li>(a) Use the following questionnaire to determine the level of self-efficacy you currently feel you demonstrate in your daily life. You do not have to share your score. The value in this process is to know yourself better.</li> </ul> <table border="1"> <thead> <tr> <th>Rating</th> <th>1 = Not true 2 = Hardly true 3 = Moderately true 4 = Exactly true</th> </tr> </thead> <tbody> <tr> <td></td> <td>I can always manage to solve difficult problems if I try hard enough.</td> </tr> <tr> <td></td> <td>If someone opposes me, I can find the means and ways to get what I want.</td> </tr> <tr> <td></td> <td>It is easy for me to stick to my aims and accomplish my goals.</td> </tr> <tr> <td></td> <td>I am confident that I could deal efficiently with unexpected events.</td> </tr> <tr> <td></td> <td>Thanks to my resourcefulness, I know how to handle unforeseen situations.</td> </tr> <tr> <td></td> <td>I can solve most problems if I invest the necessary effort.</td> </tr> <tr> <td></td> <td>I can remain calm when facing difficulties because I can rely on my coping abilities.</td> </tr> <tr> <td></td> <td>When I am confronted with a problem, I can usually find several solutions.</td> </tr> <tr> <td></td> <td>If I am in trouble, I can usually think of a solution.</td> </tr> <tr> <td></td> <td>I can usually handle whatever comes my way.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>(b) What does this tell you about how you assert yourself in difficult situations? What things can you do to be more affective in these instances?</li> </ul> <p>- In life we often encounter uncomfortable situations where we have to assert ourselves. Our responses can be positive or negative. Below you will find four such situations. Craft both a negative and positive response for each. Refer to the list titled <i>Strategies for Change</i> on page 52 of <i>An Invitation to Health, Second Edition</i>.</p> <ul style="list-style-type: none"> <li>• Your friend has told a joke that is inappropriate for the group of people you are in.</li> <li>• You are in class and learning a new concept that you are finding difficult.</li> <li>• You have received a grade on a test that you feel is unfair.</li> <li>• Your child has broken your favorite ornament while playing ball inside the house after being asked to play outside.</li> </ul> <p>- There are a variety of online tests for examining one's anger profile. Try these three tests. Did they report similar findings? Do you feel any of these tests accurately reflect your ability to control your anger?</p> <p><i>Psychology Today Anger Profile Test      Mentalhelp Anger Management Quiz</i>  <i>Discovery Health Anger Test Abridged</i></p>	Rating	1 = Not true 2 = Hardly true 3 = Moderately true 4 = Exactly true		I can always manage to solve difficult problems if I try hard enough.		If someone opposes me, I can find the means and ways to get what I want.		It is easy for me to stick to my aims and accomplish my goals.		I am confident that I could deal efficiently with unexpected events.		Thanks to my resourcefulness, I know how to handle unforeseen situations.		I can solve most problems if I invest the necessary effort.		I can remain calm when facing difficulties because I can rely on my coping abilities.		When I am confronted with a problem, I can usually find several solutions.		If I am in trouble, I can usually think of a solution.		I can usually handle whatever comes my way.	<p><b>Print Resources:</b></p> <p>Psychology: A Journey (Coon, Brown, Malik and McKenzie)</p> <p>A Invitation to Health (Hales and Lauzon)</p> <p><b>Online Resources:</b></p> <p>Discovery Health Self Esteem Test Abridged</p> <p>Test Café Self Esteem Test</p> <p>Psychology Today Anger Profile Test</p> <p>Mentalhelp Anger Management Quiz</p> <p>Discovery Health Anger Test Abridged</p> <p>APA Online Controlling Anger Before It Controls You</p> <p>TED Martin Seligman on Positive Psychology</p>
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**Unit 5: Psychology (Optional Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that affect mental health and distinguish among common psychological disorders.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>5.1 Identify the characteristics of emotional, mental and spiritual health. (Continued from the last few pages.)</p>	<ul style="list-style-type: none"> <li>• Have learners examine the differences between mental health and mental illness, and list some of the effects of mental health on physical health, and vice versa.</li> </ul>

**Unit 5: Psychology (Optional Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that affect mental health and distinguish among common psychological disorders.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- Read the following brief articles found on the web and answer the following questions.  <a href="http://www.nehb.ie/youthhealthne/mental%20health%20definition.htm">http://www.nehb.ie/youthhealthne/mental%20health%20definition.htm</a>            (or google <i>Youthhealthne Mental Health Definition</i>)  <a href="http://www.camh.net/education/Resources_teachers_schools/Drug_Curriculum/Grades_11-12_Mental_Health/curriculum_mh_gr11to12bckgrnd.html">http://www.camh.net/education/Resources_teachers_schools/Drug_Curriculum/Grades_11-12_Mental_Health/curriculum_mh_gr11to12bckgrnd.html</a>            (or google <i>CAMH Educating Students Mental Health vs. Mental Illness</i>)  <a href="http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/mental-eng.php">http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/mental-eng.php</a>            (or google <i>Health Canada It's Your Health Mental Health Mental Illness</i>)           <ol style="list-style-type: none"> <li>(a) What is mental health?</li> <li>(b) What is mental illness?</li> <li>(c) What percentage of the Canadian population is expected to experience a mental illness in their lifetime? What was the estimated cost of mental illness in Canada in 1993?</li> <li>(d) Mental health problems can increase the chance of developing physical health problems. Name some of these related physical health problems.</li> </ol> </li> <li>- When dealing with a mental illness, should the physical health of the patient be examined and, in some cases, modified? Why or why not? Indicate what reference materials you used to arrive at this answer.</li> </ul>	<p><b>Print Resources:</b>            Psychology: A Journey (Coon, Brown, Malik and McKenzie)</p> <p>A Invitation to Health (Hales and Lauzon)</p> <p><b>Online Resources:</b>            Ocean State Psychology            What's the Relationship Between Physical and Emotional Health</p> <p>Redorbit The Relationship Between Physical &amp; Mental Health Co-Occurring Mental &amp; Physical Disorders</p> <p>AMWA Untreated Physical Health Problems Among Women Diagnosed With Serious Mental Illness</p> <p>WJM Poor Physical Health of People With Mental Illness</p> <p>Rethink Mental Illness            Physical Health and Wellbeing</p> <p>Royal College of Psychiatrists            Physical Illness and Mental Health</p> <p>The Influence of Exercise on Mental Health Landers</p> <p>APA Integrating Physical Activity Into Mental Health Services for Persons with Serious Mental Illness</p>



**Unit 5: Psychology (Optional Unit)**

**Focus Statement** – Learners will demonstrate an understanding of the factors that affect mental health and distinguish among common psychological disorders.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- Assignment: Psychological Distress Use the following online and print resources. Online: <i>Public Health Agency of Canada Report on Mental Illnesses in Canada</i> Online: <i>Royal College of Psychologists Help is at Hand Leaflets</i> Print: <i>An Invitation to Health, Second Edition</i> chapter 3 Print: <i>The World of Psychology</i> chapter 13</li> <li>(a) What is the psychological determination of “psychological distress”?</li> <li>(b) Describe the following disorders:               <ul style="list-style-type: none"> <li>- Anxiety disorders (panic disorder, phobic disorders, GAD, OCD, PTSD)</li> <li>- Somatoform disorder (hypochondriasis)</li> <li>- Dissociative disorders (dissociative amnesia)</li> <li>- Mood disorders (depression, bipolar disorder)</li> <li>- Schizophrenia</li> <li>- Personality Disorders (Limited to borderline personality disorder)</li> <li>- Substance related disorders</li> </ul> </li> <li>(c) Discuss how experiencing any of these disorders can create psychological distress in one’s life.</li> <li>- People often wish to know if they are suffering from or moving toward psychological distress. This can only be determined by a psychologist or psychiatrist however, there are several online tests that can provide one with preliminary information to help one decide whether or not to seek professional advice or assistance. Go to the following website. <a href="http://counsellingresource.com/quizzes/index.html">http://counsellingresource.com/quizzes/index.html</a> (or google <i>Counselling Resource Psychological Screening Tests and Quizzes</i>) A list of tests is found on the right side of the page. Try a few of the tests. Read the instructions carefully. So tests are written assuming that you have a pre-existing condition. You do not have to share the information with anyone.</li> <li>- Use <i>An Invitation to Health, Second Edition</i> chapter 3 to answer the following:               <ul style="list-style-type: none"> <li>(a) There are many types of therapists available to assist when needed. List five types and give a brief description of each.</li> <li>(b) There are also many types of treatments available. List five treatment options and give a brief example of each.</li> <li>(c) A person’s cultural background can have a great affect on how he or she is treated for a disorder. Write a paragraph to agree or disagree with this statement. Use the resources listed above and give proof to back up your opinion.</li> </ul> </li> <li>- When you are in need of help there are many places to go and people to turn to list five places or people you could access if you or a loved one should be in need of help.</li> <li>- People in certain professions have a greater likelihood of suffering from a mental illness. Two such professions are troops deployed in combat and teachers. Investigate the mental illnesses associated with either of these professions. Indicate the frequency of such illnesses and the types and availability of treatments.</li> </ul>	<p><b>Print Resources:</b> Psychology: A Journey (Coon, Brown, Malik and McKenzie)</p> <p>A Invitation to Health (Hales and Lauzon)</p> <p><b>Online Resources:</b> Quebec Mental Health Most Common Illness</p> <p>Children's Mental Health Ontario Get Help Disorders in Children and Adolescents</p> <p>YouTube: Panic and Anxiety Disorders Treatments for Mental Health Documentary</p> <p>Nova Scotia Department of Health Mental Health Programs Strategies</p> <p>Healthline Mental Health Disorders</p> <p>Scientists Identify Strategies to Prevent Mental Illness Arehart-Treichel</p> <p>Prevent Mental Illness with Early Detection Maine Medical Center</p> <p>Teachers TV School Matters Teacher Mental Health</p> <p>CBC News Post-Traumatic Stress Disorder</p> <p>CTV News Broken Soldiers Combating Military Stress</p> <p>Healthzone PTSD Hidden Scars Westhead</p>



**Unit 6: Forensics (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of the principles and procedures involved in a forensic investigation, and use some of these procedures to investigate a simulated crime scene.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- Use a variety of sources to develop a timeline illustrating major events / technological developments / people in the evolution of forensics analysis and investigation. Here are some online resources you may choose to use. <i>YouTube: Forensic Science Timeline      Forensic Science Timeline Rudin Inman Crimeline History of Forensic Science      CBS News Forensics Timeline</i></li> <li>- The Warren Commission finding that Lee Harry Oswald was the lone gunman in the 1963 assassination of John F. Kennedy is still viewed as controversial. Since then numerous researchers have continued to analyze the evidence in hope of reaching a definitive answer. In this activity, you are asked to examine a variety of ballistic reports and reach your own conclusion. You may wish to start with the following online sites. <i>Enotes Kennedy Assassination A Basic Introduction to the JFK Assassination Griffith Science Daily Bullet Evidence Challenges Findings in JFK Assassination Howstuffworks Tech JFK Assassination in New Light MSNBC Tech Puts JFK Conspiracy Theories to Rest Science Daily Neutron Activation Analysis Proves Oswald Acted Alone Dailymotion JFK Assassination Digitally Remastered</i></li> <li>- David Milgaard and Guy Paul Morin are two Canadians who were wrongly convicted of murder. What evidence (including forensic evidence) was initially used to convict each of them? What forensic evidence later cleared them of those same crimes?</li> <li>- Some criminals have gone to great effort to conceal their crimes, specifically eliminate the forensic evidence. Describe some of the elaborate schemes people have used in an attempt to foil forensic investigations. You may wish to start by viewing the Google video, <i>How to Commit the Perfect Murder</i>.</li> <li>- Discuss the role of the forensic investigator.</li> <li>- Describe the physical evidence which may be collected at a crime scene. What tools and procedures are used in the collection of this forensic evidence?</li> <li>- Create a flow chart of how to conduct a forensic investigation (e.g. step 1 - how to secure the site, step 2 – how to collect and document evidence, etc.)</li> <li>- Create a chart that compares the roles of physicists, chemists, biologists, geologists and other forensic professionals in investigating crimes. Refer to <i>Forensics: The Easy Way</i> and the online resource <i>Forensic Scientists A Career in the Crime Lab Dillon</i>.</li> <li>- Pick one forensic professional (e.g. pathologists) and demonstrate how they might contribute to a forensic investigation.</li> </ul>	<p><b>Print Resources:</b> Forensics The Easy Way (Trimm)</p> <p><b>Online Resources:</b> Investigation Discovery Extreme Forensics Serial Murders (Parts 1 to 3)  Investigation Discovery Extreme Forensics Missing Victim (Parts 1 and 2)  Investigation Discovery Extreme Forensics Who Killed Misty (Parts 1 and 2)  Thinkquest Forensic Science Let the Evidence Reveal the Truth  All You Ever Wanted to Know About Forensic Science in Canada  Howstuffworks How Forensic Lab Techniques Work  Howstuffworks Forensics Solving Arson Crimes  Discovery Health Videos Dr G  Ezine Articles Forensic Ballistics Recovering Hidden Serial Numbers from Firearms  Howstuffworks How Fingerprinting Works  YouTube: Chemistry 113 Forensic Science (Chapters 4, 14, and 15)  Hairs Fibers Crime and Evidence Deedrick</p>

**Unit 6: Forensics (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of the principles and procedures involved in a forensic investigation, and use some of these procedures to investigate a simulated crime scene.

<p><b>Outcomes</b></p> <p><i>Learners will be expected to</i></p>	<p><b>Elaborations</b></p>
<p>6.2 Explain scientific procedures used in forensic science and practice some of these skills in simulated situations.</p>	<ul style="list-style-type: none"> <li>• Have learners engage in a variety of simple forensic tests (blood spatter, fingerprinting, gunshot residue tests, enzyme tests, hair analysis, paper chromatography,...) with the ultimate goal of using these tests in a simulated crime scene investigation.</li> </ul>

**Unit 6: Forensics (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of the principles and procedures involved in a forensic investigation, and use some of these procedures to investigate a simulated crime scene.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <p>- For this particular outcome, learners are not expected to master specific forensic tests but rather be exposed to a variety of forensic tests, both real and simulated. The selection of the forensic tests used is at the discretion of the instructor. Time, availability of materials, and learner knowledge will likely be the deciding factors for most instructors. Here are a few teaching suggestions that instructors may choose to use. Instructors should not feel that they are limited to these suggestions.</p> <ul style="list-style-type: none"> <li>• Have learners complete <i>Case One: Rookie Training</i> found by googling <i>Forensics CSI The Experience Web Adventures</i>.</li> <li>• Complete a blood typing lab using a Boreal Blood Typing Kit (using simulated blood).</li> <li>• Take fingerprints and determine fingerprint patterns. Attempt to lift fingerprints using powder, tape, fuming with superglue.</li> <li>• Complete the experiment <i>Wrote the Ransom Note</i> found by googling <i>Shodor Forensic Science Activities Experiments</i>.</li> <li>• Analyze hair and fibre samples determining hair parts and the differences between human and animal hair using a magnifying glass and a microscope. Two such lessons can be found by googling <i>Science Olympiad Forensics Notes Worksheets Lesson Plan</i> and <i>Thinkquest Forensic Science Lesson Plans</i>.</li> <li>• Analyze soil, plant and pollen samples. Examine sand from different beaches to compare the composition and determine the origin.</li> <li>• Create a classroom forensic database which could include hair samples, fingerprints, blood types and DNA (not necessarily real samples). Blood types and DNA can be assigned to students using bar codes to simulate the DNA.</li> </ul> <p>- Learners, working individually or within a group, will encounter a simulated crime scene. They are expected to gather evidence, employ the appropriate tests, determine who committed the crime, determine how the crime was committed, and defend their findings and conclusions.</p>	<p><b>Print Resources:</b> Forensics The Easy Way (Trimm)</p> <p><b>Online Resources:</b> TruTV Forensics in the Classroom</p> <p>Forensics CSI The Experience Web Adventures</p> <p>Thinkquest Forensic Science Lesson Plans</p> <p>Shodor Forensic Science Activities Experiments</p> <p>Science Olympiad Forensics Notes Worksheets Lesson Plans</p> <p>Reachoutmichigan Fingerprinting A Lesson on Classification</p> <p>Wepapers Bloodstain Science</p> <p>Teachers Domain Lesson Plan DNA Fingerprints</p> <p>New York Times Popular Science Forensic Science</p> <p>BSAPP A CSI Simulation</p> <p>Edheads Crash Scene Investigation</p>



**Unit 7: Electricity (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of, and the impact of, static and current electricity in their daily lives.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- The Electroscope Activity An electroscope is a simple device used to detect the presence of a charge. Build an electroscope by following these steps.               <ol style="list-style-type: none"> <li>1. Cut out a cardboard circle or square just large enough to completely cover the top of a cup or glass.</li> <li>2. Bend the paper clip into the shape in the diagram</li> <li>3. Poke a small hole in the center of the cardboard and put the paper clip in so that the top bend sits on the cardboard.</li> <li>4. Cut two small rectangles of aluminum foil around 1 cm by 2.5 cm</li> <li>5. Use the paper clip to poke holes at the top on each of the rectangles so that they hang close together in the hook part of the paper clip.</li> <li>6. Place the whole thing in the cup or glass. The paper clip and the foil rectangles shouldn't be touching the sides.</li> </ol> <p>Questions:</p> <ol style="list-style-type: none"> <li>(a) Use the electroscope to show how it can be charged by contact. Use a series of diagrams and brief statements to explain what is occurring.</li> <li>(b) Use the electroscope to show how it can be charged by induction. Use a series of diagrams and brief statements to explain what is occurring. You may wish to view the following YouTube videos to further your understanding. YouTube: <i>Electrostatic Induction</i> YouTube: <i>Physics Lab Demo 2: Electrostatic Induction</i></li> </ol> </li> <li>- View the YouTube videos <i>Physics 12.1.4b Charged by Induction</i> and <i>Physics 12.1.6.a Lightning Part 1</i>, and explain how lightning occurs.</li> <li>- Research how thunder and lightning works along with precautions to take in a thunderstorm.</li> <li>- Although you might think that there are not any practical uses for static electricity, this is not the case. Go to the following website. <a href="http://www.school-for-champions.com/science/static_uses.htm">http://www.school-for-champions.com/science/static_uses.htm</a> (or google <i>School for Champions Uses for Static Electricity</i>) Which one of these applications is the most important to you? Why? Explain how static electricity is used in this application.</li> <li>- View and comment on the YouTube video <i>The woolen sweater static electricity gas station ferments the fire</i>.</li> </ul>	<p><b>Print Resources:</b></p> <p>Nova Scotia Science AE Electricity (Edvantage Publishing)</p> <p>The Electricity Unit (LeBlanc)</p> <p><b>Online Resources:</b></p> <p>The Physics Classroom Static Electricity Chapter Outline</p> <p>TutorVista Charging by Conduction and by Induction</p> <p>The Physics Classroom Inducing a Positive Charge on a Sphere</p> <p>Science Made Simple Static Electricity</p> <p>YouTube: Static Electricity Demonstration</p> <p>JLab Static Electricity PowerPoint</p> <p>Manser Physics Electricity 1 Static Electricity PowerPoint</p> <p>School for Champions Uses for Static Electricity Pollution Xerography</p> <p>YouTube: Dangers of Static Electricity</p> <p>Transport Canada Aviation Safety Static Electricity An Ever-Present Danger PDF</p> <p>CCOHS How Do I Work Safely with Flammable and Combustible Liquids Static Electricity</p>



**Unit 7: Electricity (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of, and the impact of, static and current electricity in their daily lives.

<b>Suggested Teaching and Evaluation Items</b>	<b>Resources/Notes</b>
<p><i>Learners will be expected to solve the following types of problems.</i></p> <ul style="list-style-type: none"> <li>- After researching current, resistance and voltage, create an analogy that describes how these are like water flowing through plumbing or in a river.</li> <li>- Research Ohm's Law (<math>V=IR</math>) and complete the following questions.               <ol style="list-style-type: none"> <li>(a) The current through a resistor is 2A and the voltage across it is 10V, how big is the resistor?</li> <li>(b) What if the current for the above example is only 1A? What is the resistance?</li> <li>(c) A light bulb has a resistance of 160 <math>\Omega</math> and draws 0.75 A of current when plugged into the wall socket. What is the voltage at the socket?</li> <li>(d) How much current does a radio draw if it uses 6 V and has a resistance of 24 <math>\Omega</math>?</li> </ol> </li> <li>- Research how electrical power is related to voltage, current and resistance (<math>P = VI</math>, <math>P = I^2R</math>, <math>P = V^2/R</math>) and answer the following questions.               <ol style="list-style-type: none"> <li>(a) How much power is used by an electric frying pan that has a resistance of 12 <math>\Omega</math> and operates with a voltage of 120 V?</li> <li>(b) A current of 15 A travels through your electric heater when it is connected to a 110 V wall socket. How much power does it use?</li> <li>(c) How much power is used by a light bulb that draws 0.5 A of current and uses 120 V?</li> </ol> </li> <li>- Have students build simple series and parallel circuits. Measure two of the following: voltage, current or resistance. Then using Ohm's Law, calculate the third.</li> </ul>	<p><b>Print Resources:</b>            Nova Scotia Science AE Electricity (Edvantage Publishing)             The Electricity Unit (LeBlanc)</p> <p><b>Online Resources:</b>            YouTube: Electricity and Circuits             Canada Science and Technology Museum Background Information for Electricity             Howstuffworks How Electricity Works             All About Circuits Series and Parallel Circuits Table of Contents             OpAmp Electronics DC Theory Table of Contents             YouTube: Intro to Ohms Law             YouTube: Ohm's Law Part 1 Units and Quantities             YouTube: Ohm's Law Part 2 Ohm's Law Applied to Simple Circuits             YouTube: Electric Power Formulae</p>

**Unit 7: Electricity (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of, and the impact of, static and current electricity in their daily lives.

<b>Outcomes</b> <i>Learners will be expected to</i>	<b>Elaborations</b>
7.2 Demonstrate an understanding of current electricity in the context of direct current. (Continued from the last few pages.)	<ul style="list-style-type: none"> <li>• Have learners identify dangers associated with current electricity.</li> </ul>

**Unit 7: Electricity (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of, and the impact of, static and current electricity in their daily lives.

<b>Suggested Teaching and Evaluation Items</b> <i>Learners will be expected to solve the following types of problems.</i>	<b>Resources/Notes</b>
<ul style="list-style-type: none"> <li>- Contact your local power company and report back on the dangers of current electricity and what safety precautions should be taken.</li> <li>- View the following video.  <a href="http://www.youtube.com/watch?v=-n1pSHzdahc">http://www.youtube.com/watch?v=-n1pSHzdahc</a>            (or go to YouTube and view <i>Brainiac Electric Fence</i>)            How does this video relate to the material you have learned in this unit on current electricity.</li> <li>- The Taser Assignment            The Taser, initially released to law enforcement agencies as a less than lethal weapon, is an electroshock device that uses electrical current to disrupt voluntary control of muscles.           <ul style="list-style-type: none"> <li>(a) Taser International, the company that created and manufactures the device, describes the basic electrical principles used in the device. This description can be found at the following website.  <a href="http://www.taser.com/research/Science/Pages/BasicElectricPrinciples.aspx">http://www.taser.com/research/Science/Pages/BasicElectricPrinciples.aspx</a>                (or google <i>Taser Basic Electric Principles</i>)                Without getting too technical, explain how the device works making direct reference to the voltage and current supplied by the device.</li> <li>(b) Taser use and misuse has created heated discussions in Canada and abroad. Amnesty International has recommended that all governments stop using the device until further independent research can be conducted or restrict its use to situations where officers would otherwise be justified in resorting to deadly force. There have even been heated debates within the scientific community. To get a better understanding of the contentious issue, view the materials on the following websites.  <a href="http://www.amnesty.ca/themes/tasers_backgrounder.php">http://www.amnesty.ca/themes/tasers_backgrounder.php</a>                (or google <i>Amnesty International's Concerns about Tasers</i>)  <a href="http://www.youtube.com/watch?v=nuJ-vxTy9w8">http://www.youtube.com/watch?v=nuJ-vxTy9w8</a>                (or go to YouTube and view <i>Questions About Tasers</i>)  <a href="http://www.cbc.ca/world/story/2008/01/30/taser-study.html?ref=rss">http://www.cbc.ca/world/story/2008/01/30/taser-study.html?ref=rss</a>                (or google <i>CBC Chicago Study Calls Taser's Safety Claims into Question</i>)  <a href="http://www2.canada.com/vancouver/sun/news/story.html?id=4a7b4fd6-1f26-4b27-b606-82a79c254783">http://www2.canada.com/vancouver/sun/news/story.html?id=4a7b4fd6-1f26-4b27-b606-82a79c254783</a>                (or google <i>Vancouver Sun Taser Studies Flawed Epidemiologist Says</i>)                Feel free to look for additional information about Tasers.                How do you feel about the material that you read? Do you have concerns about the current research? Why or why not? Based on what you have learned, how would you like the government and law enforcement agencies to proceed regarding the use of the Taser?</li> </ul> </li> <li>- With the downturn in the US economy in 2008, a greater number of individuals have resorted to stealing power from the power corporations. How are these individuals accomplishing this, and what are the potential ramifications of their actions?</li> </ul>	<p><b>Print Resources:</b>            Nova Scotia Science AE Electricity (Edvantage Publishing)</p> <p>The Electricity Unit (LeBlanc)</p> <p><b>Online Resources:</b>            The Electricity Forum            Dangers of Electricity</p> <p>The Technology Interface            Safety with Electricity Lunt</p> <p>Electrical Safety Foundation International</p> <p>YouTube: Learn About Electricity Dangers</p> <p>HSE Electrical Safety at Work</p> <p>YouTube: Electrical Safety in the Workplace NFPA 70E</p> <p>YouTube: Brainiac Electric Fence</p> <p>Taser Basic Electric Principles</p> <p>Amnesty International's Concerns about Tasers</p> <p>YouTube: Questions About Tasers</p> <p>CBC Chicago Study Calls Taser's Safety Claims into Question</p> <p>Vancouver Sun Taser Studies Flawed Epidemiologist Says</p> <p>YouTube: 6ABC Stealing Electricity Dangers</p>



**Unit 7: Electricity (Optional Unit)**

**Focus Statement** – Learners will demonstrate a basic understanding of, and the impact of, static and current electricity in their daily lives.

<p><b>Suggested Teaching and Evaluation Items</b></p> <p><i>Learners will be expected to solve the following types of problems.</i></p>	<p><b>Resources/Notes</b></p>																																													
<p>- Go home and find three appliances with an energy guide on it. Many products come with them these days but you are most likely to find them on appliances like stoves, dryers, freezers, and dishwashers. Record the energy guide rating in the table below and then multiply each by 12¢ to figure out how much that appliance is costing you every year.</p> <table border="1"> <thead> <tr> <th>Appliance</th> <th>Energy Guide Rating</th> <th>Cost per Year</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>- Go to your instructor and borrow an energy meter. This device plugs into the wall, and then you plug anything electric into it. It will record how much energy that device is using. Using the table below, pick 10 electrical devices around your home that you want to see how much energy they use. This could be anything from your TV or computer to your cell phone charger. Record the amount of energy used and calculate how much those devices are costing you each month. Once you are done, write a one page report on what surprised you and create strategies to help you reduce your energy use.</p> <table border="1"> <thead> <tr> <th>Devise</th> <th>Energy Used</th> <th>Cost per Month</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>- Investigate the differences in power consumption, installation, and maintenance between heating a home with an air-to-air heat pump and traditional electric baseboard heaters. Some of this information can be found at:  <a href="http://www.allaroundthehouse.com/lib.ghi.h5.htm">http://www.allaroundthehouse.com/lib.ghi.h5.htm</a>                      (or googling <i>All Around the House Home Heating Options 2007</i>)  <a href="http://www.r2000manitoba.com/heating_heat_dist2.shtml">http://www.r2000manitoba.com/heating_heat_dist2.shtml</a>                      (or googling <i>R2000 Manitoba Various Options for Home Heating Systems</i>)  <a href="http://www.livingwithmyhome.com/diy-do-it-yourself/home-heating-options.aspx">http://www.livingwithmyhome.com/diy-do-it-yourself/home-heating-options.aspx</a>                      (or googling <i>Living With My Home Heating Options</i>)</p> <p>- Investigate the pros and cons associated with changing from standard incandescent light bulbs to compact fluorescent lights and/or LED (light emitting diode) lights. This information can be found at:  <a href="http://www.eartheasy.com/live_energyeff_lighting.htm">http://www.eartheasy.com/live_energyeff_lighting.htm</a>                      (or googling <i>Eartheasy Energy Efficient Lighting</i>)</p>	Appliance	Energy Guide Rating	Cost per Year										Devise	Energy Used	Cost per Month																															<p><b>Print Resources:</b>                      Nova Scotia Science AE Electricity (Edvantage Publishing)                       The Electricity Unit (LeBlanc)</p> <p><b>Online Resources:</b>                      Nova Scotia Power Calculate Your Home Energy Costs                       All Around the House Home Heating Options 2007                       R2000 Manitoba Various Options for Home Heating Systems                       Natural Resources Canada Personal Residential EnerGuide Energy Star and R-2000                       Natural Resources Canada Personal Residential Your Key to Electricity Savings                       Scribd GL Energy Seminar 4 Reducing Electricity Consumption                       Ontario Tenants Energy Conversation and Saving Money on your Next Electricity Bill                       Eartheasy Energy Efficient Lighting                       Leader Post SaskPower Offers Rebate for Electrical Consumption Monitor                       One Million Acts of Green Install a Real-Time Electricity Cost Monitor in your Home</p>
Appliance	Energy Guide Rating	Cost per Year																																												
Devise	Energy Used	Cost per Month																																												

## Level IV Science Resources

### Print Resources:

The Introduction to Science Unit (Locally Developed: Marchand and Harvie)

The Sustainable Environment Unit (Locally Developed: Ingram, Tattrie and Harvie)

The Physical Lifestyles and Nutrition Unit (Locally Developed: Marchand and Rutledge)

The Electricity Unit (Locally Developed: LeBlanc)

An Invitation to Health; Second Canadian Edition (Thomson Publishing: Hales and Lauzon)

Psychology; A Journey (Thomson Publishing: Coon, Brown, Malik and McKenzie)

ScienceWise (Irwin Publishing: Agusta-Palmisano, Barrett, Davis, Fairchild and Thompson)

Nova Scotia Science AE Electricity (Edvantage Press: Sander, Lacy, Martha and Milross)

Nova Scotia Science AE Chemistry (Edvantage Press: Sander, Lacy, Martha and Milross)

Science Workshop Series; Mixtures and Solutions (Pearson Publishing: Rosen)

Science Workshop Series; Atoms and Elements (Pearson Publishing: Rosen)

Science Workshop Series; Reactions (Pearson Publishing: Rosen)

Forensics: The Easy Way (Barron's Educational Series: Trimm)

### Online Resources:

#### Introduction to Science Online Resources

ABC News Tasers Safe? New Study Sparks More Debate

<http://abcnews.go.com/Health/story?id=3695594&page=1>

Antibacterial Products May do more Harm than Good Coco Ballantyne

<http://www.scientificamerican.com/article.cfm?id=strange-but-true-antibacterial-products-may-do-more-harm-than-good>

Assessing the Impact of Technology on the Environment Willingwriter

[http://www.associatedcontent.com/article/529905/assessing\\_the\\_impact\\_of\\_technology.html?cat=15](http://www.associatedcontent.com/article/529905/assessing_the_impact_of_technology.html?cat=15)

Austin Cline Scientific Theories The Criteria for Science

<http://atheism.about.com/od/philosophyofscience/tp/CriteriaScientificTheory.htm>

Authorstream Technology vs Science

<http://www.authorstream.com/Presentation/sabanci-60416-TECHNOLOGY-VS-SCIENCE-presentation-goal-different-answers-technologyvssci-Education-ppt-powerpoint/>

Canada Science and Technology Museum Virtual Programs

[http://www.sciencetech.technomuses.ca/english/schoolzone/virtual\\_programs.cfm](http://www.sciencetech.technomuses.ca/english/schoolzone/virtual_programs.cfm)

Citizen Science Canada

<http://dev.stewardshipcanada.ca/communities/citizenScience/home/csnIndex.asp>

Connexions Independent and Dependent Variables

<http://cnx.org/content/m10802/latest/>

Cool Science Projects Independent and Dependent Variables

<http://www.cool-science-projects.com/independent-and-dependent-variables.html>

Howstuffworks Scientific Method Controlled Experiment

<http://videos.howstuffworks.com/hsw/5886-scientific-method-controlled-experiment-video.htm>

New York Times An Unwelcome Discovery Poehlman

<http://www.nytimes.com/2006/10/22/magazine/22sciencefraud.html>

Office of Research Integrity Eric Poehlman

[http://ori.dhhs.gov/misconduct/cases/press\\_release\\_poehlman.shtml](http://ori.dhhs.gov/misconduct/cases/press_release_poehlman.shtml)

Physicsworld Predicting the Impact of Science

<http://physicsworld.com/cws/article/print/2537>

Popular Mechanics Space Shuttle Columbia Disaster Index

[http://www.popularmechanics.com/science/air\\_space/1282976.html](http://www.popularmechanics.com/science/air_space/1282976.html)

Prof P Krishna Impact of Science on Society

[http://www.pkrishna.org/Impact\\_science\\_society.html](http://www.pkrishna.org/Impact_science_society.html)

Science and You Pure Applied What's the Difference

[http://www.scienceandyou.org/articles/ess\\_09.shtml](http://www.scienceandyou.org/articles/ess_09.shtml)

Science Physicist Debunk Claim of a New Kind of Fusion

<http://partners.nytimes.com/library/national/science/050399sci-cold-fusion.html>

Sciencebuddies Steps of the Scientific Method

[http://www.sciencebuddies.org/science-fair-projects/project\\_scientific\\_method.shtml](http://www.sciencebuddies.org/science-fair-projects/project_scientific_method.shtml)

StarChild Jocelyn Bell Burnell

[http://starchild.gsfc.nasa.gov/docs/StarChild/whos\\_who\\_level2/bell.html](http://starchild.gsfc.nasa.gov/docs/StarChild/whos_who_level2/bell.html)

TED Kary Mullis on What Scientists Do

[http://www.ted.com/index.php/talks/kary\\_mullis\\_on\\_what\\_scientists\\_do.html](http://www.ted.com/index.php/talks/kary_mullis_on_what_scientists_do.html)

The Impact of Science and Technology on Olympics Joshi

<http://www.jansamachar.net/display.php3?id=&num=13948&lang=English&PHPSESSID=9213d0233efcee49ffffa8b4e7ef480c>

Top 10 Unethical Psychological Experiments

<http://listverse.com/2008/09/07/top-10-unethical-psychological-experiments/>

Vonny Pure Science Versus Applied Science

<http://vonscience.blogspot.com/2005/08/pure-science-versus-applied-science.html>

YouTube: 10 The Scientific Method Made Easy

<http://www.youtube.com/watch?v=zcavPAFiG14>

YouTube: Evolution vs. Creationism Is Evolution Just a Theory

<http://www.youtube.com/watch?v=g7CtI9nzEqs>

YouTube: Milgram Experiment (Derren Brown)

<http://www.youtube.com/watch?v=y6GxIuljT3w>

### **Sustainable Environment Online Resources**

A Living Machine New Internationalist Kelly Redwood

[www.newint.org/issue278/machine.htm](http://www.newint.org/issue278/machine.htm)

ABC News Air Pollutants Inside the Home

<http://abcnews.go.com/video/playerIndex?id=8069834>

Canadian Cancer Society Specific Environmental Contaminants

[http://www.cancer.ca/canada-wide/prevention/specific%20environmental%20contaminants.aspx?sc\\_lang=en](http://www.cancer.ca/canada-wide/prevention/specific%20environmental%20contaminants.aspx?sc_lang=en)

Carbon Footprint Calculator Reducing Your Impact

<http://www.carbonfootprint.com/>

David Suzuki Foundation

<http://www.davidsuzuki.org/>

David Suzuki Foundation Open-net-cage Fish Farming

<http://www.davidsuzuki.org/Oceans/Aquaculture/Salmon/>

Ecological Health Public Health and Societal Well-Being

[http://www.nwpublichealth.org/docs/wph2000/eco\\_health.pdf](http://www.nwpublichealth.org/docs/wph2000/eco_health.pdf)

Eco-Pros When are Renewable Resources not Renewable

<http://www.eco-pros.com/renewableresources.htm>

Environment Canada Waste Management

<http://www.ec.gc.ca/default.asp?lang=En&n=6B993ED0-1>

Environmental Impact Assessment Asbestos Burnside

<http://www.gov.ns.ca/nse/ea/asbestosstorageburnside/besltoc.pdf>

Global Envision India and China's Resource Consumption on the Rise

<http://www.globalenvision.org/library/23/975>

Global Issues Consumption and Consumerism Shah

<http://www.globalissues.org/issue/235/consumption-and-consumerism>

Google Video: Commissioner Frank Avila Speaks Emerging Pollutants

<http://video.google.com/videoplay?docid=-327685241423425086>

Health Canada Environmental Contaminants

<http://www.hc-sc.gc.ca/ewh-semt/contaminants/index-eng.php>

Howstuffworks Earth Science: Global Warming

<http://videos.howstuffworks.com/hsw/26566-earth-science-global-warming-video.htm>

Howstuffworks Sally Ride on Climate Change

<http://videos.howstuffworks.com/nasa/13534-sally-ride-on-climate-change-video.htm>

Howstuffworks Weather: Reversing Global Warming

<http://videos.howstuffworks.com/hsw/21399-weather-reversing-global-warming-video.htm?sort=date>

India, China's Resource Consumption on the Rise State of the World Report

[http://infochangeindia.org/index2.php?option=com\\_content&do\\_pdf=1&id=6020](http://infochangeindia.org/index2.php?option=com_content&do_pdf=1&id=6020)

Learningspace Ecological Health

<http://openlearn.open.ac.uk/mod/resource/view.php?id=365484>

Lestari Pollution and Contamination

<http://www.lestari.ukm.my/urbangeology/pollution.asp>

MacLeans Kohler Nation of Eco-Hogs

[http://www.macleans.ca/science/environment/article.jsp?content=20080416\\_94434\\_94434](http://www.macleans.ca/science/environment/article.jsp?content=20080416_94434_94434)

Millennium Project Global Challenges Energy Demands

[http://www.millennium-project.org/millennium/Global\\_Challenges/chall-13.html](http://www.millennium-project.org/millennium/Global_Challenges/chall-13.html)

MIT World Meeting Global Energy Demands Sustainably

<http://mitworld.mit.edu/video/413/>

NCBI Hazards of Heavy Metal Contamination

<http://www.ncbi.nlm.nih.gov/pubmed/14757716>

New York Times What's Your Consumption Factor Diamond

<http://www.nytimes.com/2008/01/02/opinion/02diamond.html>

Peter Russell World Clock

<http://www.peterrussell.com/Odds/WorldClock.php>

Power Scorecard Twenty Things You Can Do to Conserve Energy

[http://www.powerscorecard.org/reduce\\_energy.cfm](http://www.powerscorecard.org/reduce_energy.cfm)

Scalloway Differences Between Developed and Developing Countries

<http://www.scalloway.org.uk/popu6.htm>

Scalloway Population Structure

<http://www.scalloway.org.uk/popu4.htm>

Scalloway Standard of Living and Population Density

<http://www.scalloway.org.uk/popu2.htm>

TED Al Gore on Averting Climate Crisis

[http://www.ted.com/index.php/talks/al\\_gore\\_on\\_averting\\_climate\\_crisis.html](http://www.ted.com/index.php/talks/al_gore_on_averting_climate_crisis.html)

TED Alex Steffen Sees a Sustainable Future

[http://www.ted.com/talks/alex\\_steffen\\_sees\\_a\\_sustainable\\_future.html](http://www.ted.com/talks/alex_steffen_sees_a_sustainable_future.html)

TED Majora Carter Sustainable Living

<http://videos.howstuffworks.com/ted-conferences/1730-majora-carter-talks-at-ted-about-sustainable-living-video.htm>

TED Ray Anderson on the Business Logic of Sustainability

[http://www.ted.com/talks/ray\\_anderson\\_on\\_the\\_business\\_logic\\_of\\_sustainability.html](http://www.ted.com/talks/ray_anderson_on_the_business_logic_of_sustainability.html)

US Census Bureau International Data Base Country Summaries

<http://www.census.gov/ipc/www/idb/informationGateway.php>

Worldchanging New Research Ranks Top Renewable Energy Options

<http://www.worldchanging.com/archives/009182.html>

Videojug Mercury and Fish

<http://www.videojug.com/interview/mercury-and-fish>

YouTube: Edmonton Waste Management Centre

<http://www.youtube.com/watch?v=CKpIoYRfshU>

YouTube: Interview with David Suzuki.

<http://www.youtube.com/watch?v=qvCm7rixdZk>

YouTube: Nuclear Waste Management Practices

<http://www.youtube.com/watch?v=cKFhoOeTLnI>

YouTube: Salmon, Sea Lice and Science

<http://www.youtube.com/watch?v=FvTZ3x61kFk>

### **Physical Lifestyles and Nutrition Online Resources**

ABC News Wellness Quiz Test Your Health IQ

<http://abcnews.go.com/GMA/OnCall/story?id=6900640&page=1>

Canadian Food Inspection Agency

<http://www.inspection.gc.ca/english/toce.shtml>

Canadian Food Inspection Agency Labelling

<http://www.inspection.gc.ca/english/fssa/labeti/guide/toce.shtml>

Canadian Partnership for Consumer Food Safety Education

<http://www.canfightbac.org/en/>

CBC News Death of B.C. Man Linked to Listeria Outbreak

<http://www.cbc.ca/consumer/story/2008/08/22/listeria.html>

CBC News Food Additives Explained

<http://www.cbc.ca/news/background/foodsafety/additives.html>

CBC News Food Labels The Facts About What's in Your Food

<http://www.cbc.ca/news/background/food-supply/index.html>

CBC News Food Safety

<http://www.cbc.ca/news/background/foodsafety/>

CBC News Genetically Modified Foods A Primer

[http://www.cbc.ca/news/background/genetics\\_modification/](http://www.cbc.ca/news/background/genetics_modification/)

CBC News In Depth Adult Body Mass Index

<http://www.cbc.ca/news/background/fats/bmi.html>

CBC News In Depth Banning Bad Fat

[http://www.cbc.ca/news/background/fats/banning\\_badfats.html](http://www.cbc.ca/news/background/fats/banning_badfats.html)

CBC News In Depth Omega-3 Fatty Acids Your Heart Loves

<http://www.cbc.ca/news/background/fats/omega-3.html>

CBC News Listeria FAQs

<http://www.cbc.ca/consumer/story/2008/08/21/f-listeria-faqs.html>

CBC News More Child Deaths Linked to China's Melamine Scandal

<http://www.cbc.ca/world/story/2008/11/16/china-melamine.html>

CBC News More Listeriosis Cases Expected Recall

<http://www.cbc.ca/health/story/2008/08/24/health-listeria.html>

CBC News U.S. Warns Against Diet Pills Sold Online

<http://www.cbc.ca/health/story/2008/12/22/diet-pills.html>

CBC News Weight Loss Does Dieting Make You Fat

<http://www.cbc.ca/news/background/fats/dieting.html>

CBS News Debunking Nutrition Myths

<http://atlantis2.cbsnews.com/video/watch/?id=3959925n>

CDC Nutrition for Everyone Introduction

<http://www.cdc.gov/nutrition/everyone/index.html>

Centralhome Carbohydrates Friend or Foe

<http://desiretoknow.com/Health-and-Fitness/Lee-Coyne/Carbohydrates/>

Centralhome Eating Out the Healthy Way

<http://www.centralhome.com/Eating-out.htm>

Centralhome Re-Shape Your Diet

<http://www.centralhome.com/fitness/diet.htm>

CSPI Food Additives

<http://cspinet.org/reports/chemcuisine.htm>

CTV News Food Additives Appear to Increase Hyperactivity

[http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070905/food\\_colouring\\_070905?s\\_name=&no\\_ads=](http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070905/food_colouring_070905?s_name=&no_ads=)

CTV News Ontario Death Confirmed in Listeriosis Outbreak

[http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20080820/mlf\\_recall\\_080820/20080820?hub=Canada](http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20080820/mlf_recall_080820/20080820?hub=Canada)

CTV News Ontario Doctors Urge for Calorie Information on Menus

[http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20090407/menus\\_090407?s\\_name=&no\\_ads=](http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20090407/menus_090407?s_name=&no_ads=)

Definition of Wellness Definition of Dimensions

<http://definitionofwellness.com/>

Dietfacts Nutrition Facts for Restaurants

<http://www.dietfacts.com/>

Dietitians of Canada Eatracker

<http://www.dietitians.ca/public/content/eat%5Fwell%5Flive%5Fwell/english/eatracker/>

Dietitians of Canada Recipe Analyzer

[http://www.dietitians.ca/public/content/eat\\_well\\_live\\_well/english/recipeanalyzer/recipeanalyzer.asp](http://www.dietitians.ca/public/content/eat_well_live_well/english/recipeanalyzer/recipeanalyzer.asp)

Fitday

<http://www.fitday.com/>

Google Video: Dr Russell Blaylock Nutrition and Behavior

<http://video.google.ca/videoplay?docid=2963728494205235281>

Google Video: Quest for Nutrition

<http://video.google.com/videoplay?docid=-2918532031358196867>

Government of Alberta Fad Diets Too Good to Be True

<http://www.healthyalberta.com/HealthyEating/782.htm>

Government of Alberta Food Labels Understanding the Language

<http://www.healthyalberta.com/HealthyEating/784.htm>

Health Canada Food Additive

<http://www.hc-sc.gc.ca/fn-an/securit/addit/index-eng.php>

Health Canada Food Guide

<http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>

Health Canada Food Labels

<http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/using-utiliser/label-etiquet-eng.php>

Health Canada Genetically Modified Foods

<http://www.hc-sc.gc.ca/fn-an/gmf-agm/index-eng.php>

Health Canada Guidelines for Body Weight Classification in Adults

<http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/qa-qr-pub-eng.php>

Health Canada Healthy Living Physical Activity  
<http://www.hc-sc.gc.ca/hl-vs/physactiv/index-eng.php>

Health Canada Listeria Food Safety  
<http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/food-aliment/listeria-eng.php>

Healthcastle Nutrition & Heart Disease  
<http://www.healthcastle.com/hearthealthy.shtml>

Hoptechno Fitness Fundamentals  
<http://www.hoptechno.com/book11.htm>

Howstuffworks Body Invaders Nutrients and Diet  
<http://videos.howstuffworks.com/discovery-health/14065-body-invaders-nutrients-and-diet-video.htm>

Howstuffworks Controlling Your Cholesterol Part of a Healthy Life  
<http://videos.howstuffworks.com/hsw/20691-controlling-your-cholesterol-part-of-a-healthy-life-video.htm>

Howstuffworks Dr. Whyte Four Numbers You Need to Know  
[http://videos.howstuffworks.com/discovery-health/4881-dr-whyte-four-numbers-you-need-to-know-video.htm?sort=most\\_watched&page=3](http://videos.howstuffworks.com/discovery-health/4881-dr-whyte-four-numbers-you-need-to-know-video.htm?sort=most_watched&page=3)

Howstuffworks Dr. Whyte Vitamins  
<http://videos.howstuffworks.com/discovery-health/4900-dr-whyte-vitamins-video.htm>

Howstuffworks Eating for Your Future A Balanced Diet  
<http://videos.howstuffworks.com/hsw/22399-eating-for-your-future-a-balanced-diet-video.htm>

Howstuffworks Eating for Your Future Fiber and the American Diet  
<http://videos.howstuffworks.com/hsw/22392-eating-for-your-future-fiber-and-the-american-diet-video.htm>

Howstuffworks Investigating Human Biology The Importance of Exercise  
<http://videos.howstuffworks.com/hsw/8187-investigating-human-biology-the-importance-of-exercise-video.htm>

Howstuffworks Managing Your Health Weight Control  
<http://videos.howstuffworks.com/hsw/13398-managing-your-health-weight-control-video.htm>

Human Resources and Skills Development Canada Life Expectancy at Birth  
<http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=3>

MHHE Wellness Worksheet 1  
[http://www.mhhe.com/socscience/hhp/fahey7e/wellness\\_worksheets/wellness\\_worksheet\\_001.html](http://www.mhhe.com/socscience/hhp/fahey7e/wellness_worksheets/wellness_worksheet_001.html)

NAT Nutrition Analysis Tool  
<http://www.nat.uiuc.edu/mainnat.html>

Nova Scotia Food Establishment Inspection Reports  
<http://gov.ns.ca/agri/foodsafety/reports/>

NutriStrategy Nutrients Vitamins Minerals Dietary Information  
<http://www.nutristrategy.com/nutritioninfo2.htm>

Nutritionizing Food Nutrition Components

<http://www.nutritionizing.com/>

Preventous Benefits of Physical Fitness

<http://www.preventous.com/calgary-private-health/benefits-of-physical-fitness.html>

Public Health Agency of Canada Physical Activity Guide Downloads

<http://www.phac-aspc.gc.ca/pau-uap/fitness/downloads.html>

Public Health Agency of Canada The Benefits of Physical Activity

<http://www.phac-aspc.gc.ca/pau-uap/fitness/benefits.html>

Purchon A Balanced Diet

<http://www.purchon.com/biology/diet.htm>

Organic Consumers Association Debate Erupts After Canada Parliament Votes Against GE Food Labels

<http://www.organicconsumers.org/gefood/mplabels102901.cfm>

School for Champions Lifestyle Factors Affecting Quality of Life in Late Adulthood

[http://www.school-for-champions.com/health/lifestyle\\_elderly.htm](http://www.school-for-champions.com/health/lifestyle_elderly.htm)

Seekwellness Nutrition and Disease

<http://www.seekwellness.com/nutrition/disease.htm>

Siteman Cancer Center Your Disease Risk

<http://www.yourdiseaserisk.wustl.edu/>

Statistics Canada Adult Body Mass Index Fact Sheet

<http://www.statcan.gc.ca/pub/82-221-x/2009001/tblstructure/1hs/1hc/hc1abm-eng.htm>

TED Ann Cooper Talks School Lunches

[http://www.ted.com/talks/ann\\_cooper\\_talks\\_school\\_lunches.html](http://www.ted.com/talks/ann_cooper_talks_school_lunches.html)

TED Mark Bittman on What's Wrong with What We Eat

[http://www.ted.com/talks/mark\\_bittman\\_on\\_what\\_s\\_wrong\\_with\\_what\\_we\\_eat.html](http://www.ted.com/talks/mark_bittman_on_what_s_wrong_with_what_we_eat.html)

The China Post Melamine Scare Escalates

<http://www.chinapost.com.tw/taiwan/national/national%20news/2008/09/23/175808/Melamine-scare.htm>

The Dimensions of Wellness How Am I Doing

[http://www.goodlifefitness.com/nqi/pdf/en/Dimensions\\_of\\_Wellness\\_How\\_Am\\_I\\_Doing\\_ENGLISH.pdf](http://www.goodlifefitness.com/nqi/pdf/en/Dimensions_of_Wellness_How_Am_I_Doing_ENGLISH.pdf)

The Truth About High Protein Low Carbohydrate Diets

<http://www.york.ca/nr/rdonlyres/jvywd5cetwkitnwqel3ctybyq6obf2vehi654epxf4ftbrj3gtnougvra3xtwwcshjacifz7lnnfuvae7ls7s6hlie/the+truth+about+high+protein+low+carb+diets.pdf>

Videojug Dietary Supplements

<http://www.videojug.com/interview/dietary-supplements-2>

YouTube: Bill Mahar Rant on Food Nutrition

<http://www.youtube.com/watch?v=jyv6PglOQEc>

YouTube: Nutrition Gut and Cancer

<http://www.youtube.com/watch?v=gqyUQvHUGm0>

YouTube: The Wellness Concept

<http://www.youtube.com/watch?v=01HUCSnOikY>

## **Chemistry Online Resources**

5min Electrons Orbitals and Electron Shells

<http://www.5min.com/Video/Electrons-Orbitals-and-Electron-Shells-150611757>

Aspenview Naming Chemical Compounds

[http://www.aspenview.org/schools/epc/LZinnick/science10/HTML\\_Files/Chemistry/Name\\_Other\\_compounds.htm](http://www.aspenview.org/schools/epc/LZinnick/science10/HTML_Files/Chemistry/Name_Other_compounds.htm)

CBC Digital Archives Dishing the Dirt on Phosphate 1970

<http://archives.cbc.ca/environment/pollution/clips/8679/>

CBC News Canada Moves to Cut Phosphates to Fight Algae Problem

<http://www.cbc.ca/canada/montreal/story/2008/02/15/qc-phosphates0215.html>

Cerlabs Observing Signs of Chemical Reaction PDF

<http://www.cerlabs.com/experiments/10875406041.pdf>

Chemguide Atomic Orbitals

<http://www.chemguide.co.uk/atoms/properties/atomorbs.html>

Chemicool Periodic Table

<http://www.chemicool.com/>

Chemistry Daily Chemical Reaction

[http://www.chemistrydaily.com/chemistry/Chemical\\_reactions](http://www.chemistrydaily.com/chemistry/Chemical_reactions)

Chemistry Daily Dihydrogen Monoxide

[http://www.chemistrydaily.com/chemistry/Dihydrogen\\_Monoxide](http://www.chemistrydaily.com/chemistry/Dihydrogen_Monoxide)

CLCA WHMIS Responsibilities of the Employer

[http://www.clca.ca/ont\\_whmis\\_legislation.htm](http://www.clca.ca/ont_whmis_legislation.htm)

Daviddarling Silicon Based Life

<http://www.daviddarling.info/encyclopedia/S/siliconlife.html>

dhmo.org

<http://www.dhmo.org/>

eHow How to Apply the Law of Conservation of Mass

[http://www.ehow.com/how\\_4449453\\_apply-law-conservation-mass.html](http://www.ehow.com/how_4449453_apply-law-conservation-mass.html)

Health Canada Chemical Hazards

<http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hecs-dgsesc/psp-pp/chem-chimie-eng.php>

Heath Canada Effects of Synthetic Estrogen on Aquatic Populations  
<http://www.hc-sc.gc.ca/sr-sr/finance/tsri-irst/proj/endocrin/tsri-94-eng.php>

Howstuffworks Assignment Discovery Electron Shells  
<http://videos.howstuffworks.com/discovery/29397-assignment-discovery-electron-shells-video.htm>

HRSB Interpretation Guide for Nova Scotia's WHMIS Regulations PDF  
<http://www.hrsb.ns.ca/files/downloads/pdf/hr/oh&s/whmis%20interpretation%20guide.pdf>

HRSBSTAFF WHMIS Regulations Nova Scotia PPT  
[http://hrsbstaff.ednet.ns.ca/judsonj/Safety/Binder\\_WHMIS%20ppt%20FINAL.ppt](http://hrsbstaff.ednet.ns.ca/judsonj/Safety/Binder_WHMIS%20ppt%20FINAL.ppt)

Mr Guch How Can I Balance an Equation  
<http://misterguch.brinkster.net/eqnbalance.html>

NASA Astrobiology Institute Silicon Based Life  
[http://nai.arc.nasa.gov/astrobio/feat\\_questions/silicon\\_life.cfm](http://nai.arc.nasa.gov/astrobio/feat_questions/silicon_life.cfm)

NewsInferno Phosphate Ban Gains Steam in Canada  
<http://www.newsinferno.com/archives/2255>

NSCC WHMIS Information from the Tutorials  
<http://access.nsc.ns.ca/safety/whmistxt.htm>

Saskworkguide Investigate Chemical Reactions Involving Acids and Bases  
<http://www.saskworkguide.ca/docs/xsci/cr5xsc.html>

Science Daily Chemicals in our Water are Affecting Human and Aquatic Life  
<http://www.sciencedaily.com/releases/2008/02/080216095740.htm>

Slideshare 4-6 Naming Ionic Compounds  
<http://www.slideshare.net/rkelch/46-naming-ionic-compounds>

Tuckahoe Conservation of Mass PDF  
<http://www.tuckahoe.k12.ny.us/Science%20pdfs/Matter/ds%20Conservation%20of%20Mass%20Lab.pdf>

Yahoo Video Electron Configuration  
<http://video.yahoo.com/watch/193832/925988>

YouTube: Balancing Equations Part 1  
<http://www.youtube.com/watch?v=bDiBHbM0Its>

YouTube: Balancing Equations Part 2  
<http://www.youtube.com/watch?v=A15EFBYJf-0>

YouTube: Chemistry Music Video Elemental Funkiness  
<http://www.youtube.com/watch?v=Cj11XI8f5Y8>

YouTube: Five Common Chemical Reactions  
<http://www.youtube.com/watch?v=tE4668aarck>

YouTube: Junior Chemistry The Periodic Table 1  
<http://www.youtube.com/watch?v=gBE-QJYcmG0>

YouTube: Ionic and Covalent Bonding Animation  
<http://www.youtube.com/watch?v=QqjCvzWwww>

### **Psychology Online Resources**

AMWA Untreated Physical Health Problems Among Women Diagnosed With Serious Mental Illness  
<http://www.amwa-doc.org/index.cfm?objectid=47A0C94B-D567-0B25-5AC6AC687E02F490>

APA Integrating Physical Activity Into Mental Health Services for Persons with Serious Mental Illness  
<http://www.psychservices.psychiatryonline.org/cgi/content/full/54/11/1491>

APA Online Controlling Anger Before It Controls You  
<http://www.apa.org/topics/controlanger.html>

CAMH Educating Students Mental Health vs. Mental Illness  
[http://www.camh.net/education/Resources\\_teachers\\_schools/Drug\\_Curriculum/Grades\\_11-12\\_Mental\\_Health/curriculum\\_mh\\_gr11to12bckgrnd.html](http://www.camh.net/education/Resources_teachers_schools/Drug_Curriculum/Grades_11-12_Mental_Health/curriculum_mh_gr11to12bckgrnd.html)

CBC News Post-Traumatic Stress Disorder  
<http://www.cbc.ca/health/story/2008/12/17/f-ptsd.html>

Children's Mental Health Ontario Get Help Disorders in Children and Adolescents  
[http://www.kidsmentalhealth.ca/get\\_help/common\\_disorders.php](http://www.kidsmentalhealth.ca/get_help/common_disorders.php)

CTV News Broken Soldiers Combating Military Stress  
[http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/1047060032429\\_37///?hub=Specials](http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/1047060032429_37///?hub=Specials)

Counselling Resource Psychological Screening Tests and Quizzes  
<http://counsellingresource.com/quizzes/index.html>

Discovery Health Anger Test Abridged  
[http://discoveryhealth.queendom.com/anger\\_abridged\\_access.html](http://discoveryhealth.queendom.com/anger_abridged_access.html)

Discovery Health Self Esteem Test Abridged  
[http://discoveryhealth.queendom.com/self\\_esteem\\_abridged\\_access.html](http://discoveryhealth.queendom.com/self_esteem_abridged_access.html)

Health Canada It's Your Health Mental Health Mental Illness  
<http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/mental-eng.php>

Healthline Mental Health Disorders  
<http://www.healthline.com/channel/mental-health-disorders.html>

Healthzone PTSD Hidden Scars Westhead  
<http://www.healthzone.ca/health/article/443281>

Mentalhelp Anger Management Quiz  
[http://www.mentalhelp.net/poc/view\\_doc.php?type=doc&id=3396&cn=116](http://www.mentalhelp.net/poc/view_doc.php?type=doc&id=3396&cn=116)

Nova Scotia Department of Health Mental Health Programs Strategies  
<http://www.gov.ns.ca/health/mhs/>

Ocean State Psychology What's the Relationship between Physical and Emotional Health

<http://www.ocean-state-psychology.com/stress-health.html>

Prevent Mental Illness with Early Detection Maine Medical Center

[http://www.preventmentalillness.org/pier\\_home.html](http://www.preventmentalillness.org/pier_home.html)

Psychology Today Anger Profile Test

[http://psychologytoday.psychtests.com/tests/anger\\_access.html](http://psychologytoday.psychtests.com/tests/anger_access.html)

Public Health Agency of Canada Report on Mental Illnesses in Canada

<http://www.phac-aspc.gc.ca/publicat/miic-mmacc/index-eng.php>

Quebec Mental Health Most Common Illness

[http://www.msss.gouv.qc.ca/sujets/prob\\_sante/sante\\_mentale/index.php?maladies\\_les\\_plus\\_frequentes\\_en](http://www.msss.gouv.qc.ca/sujets/prob_sante/sante_mentale/index.php?maladies_les_plus_frequentes_en)

Redorbit The Relationship Between Physical & Mental Health Co-Occurring Mental & Physical Disorders

[http://www.redorbit.com/news/health/117001/the\\_relationship\\_between\\_physical\\_mental\\_health\\_cooccurring\\_mental/index.html](http://www.redorbit.com/news/health/117001/the_relationship_between_physical_mental_health_cooccurring_mental/index.html)

Rethink Mental Illness Physical Health and Wellbeing

[http://www.rethink.org/living\\_with\\_mental\\_illness/everyday\\_living/physical\\_health\\_and\\_wellbeing/index.html](http://www.rethink.org/living_with_mental_illness/everyday_living/physical_health_and_wellbeing/index.html)

Royal College of Psychiatrists Physical Illness and Mental Health

<http://www.rcpsych.ac.uk/mentalhealthinfoforall/problems/physicalillness/copingwithphysicalillness.aspx>

Royal College of Psychologists Help is at Hand Leaflets

<http://www.rcpsych.ac.uk/mentalhealthinfoforall/problems/anxietyphobias/anxietyphobias.aspx>

Scientists Identify Strategies to Prevent Mental Illness Arehart-Treichel

<http://pn.psychiatryonline.org/cgi/content/full/41/10/50>

Teachers TV School Matters Teacher Mental Health

<http://www.teachers.tv/video/27050>

TED Martin Seligman on Positive Psychology

[http://www.ted.com/talks/martin\\_seligman\\_on\\_the\\_state\\_of\\_psychology.html](http://www.ted.com/talks/martin_seligman_on_the_state_of_psychology.html)

Test Café Self Esteem Test

<http://www.testcafe.com/sest/>

The Influence of Exercise on Mental Health Landers

<http://www.fitness.gov/mentalhealth.htm>

WJM Poor Physical Health of People With Mental Illness

<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1071612>

Youthhealthne Mental Health Definition

<http://www.nehb.ie/youthhealthne/mental%20health%20definition.htm>

YouTube: Panic and Anxiety Disorders Treatments for Mental Health Documentary

<http://www.youtube.com/watch?v=eQgxrPb3DM>

## Forensics Online Resources

A Basic Introduction to the JFK Assassination Griffith

<http://michaelgriffith1.tripod.com/jfkintro.htm>

All You Ever Wanted to Know About Forensic Science in Canada

<http://www.csfs.ca/contentadmin/UserFiles/File/Booklet2007.pdf>

BSAPP A CSI Simulation

<http://www.bsapp.com/csisimulation/>

CBS News Forensics Timeline

<http://www.cbsnews.com/htdocs/forensics/timeline.html>

Crimeline History of Forensic Science

[http://www.crimezzz.net/forensic\\_history/index.htm](http://www.crimezzz.net/forensic_history/index.htm)

Dailymotion JFK Assassination Digitally Remastered

[http://www.dailymotion.com/video/x3fhw1\\_jfk-assassination-digitally-remaste\\_news](http://www.dailymotion.com/video/x3fhw1_jfk-assassination-digitally-remaste_news)

Discovery Health Videos Dr G

<http://health.discovery.com/videos/dr-g-tools-of-the-trade.html>

<http://health.discovery.com/videos/dr-g-dr-g-in-the-courtroom.html>

<http://health.discovery.com/videos/dr-g-the-unnatural-fall.html>

<http://health.discovery.com/videos/dr-g-medical-examiner-hidden-causes.html>

Enotes Kennedy Assassination

[http://www.edheads.org/activities/crash\\_scene/](http://www.edheads.org/activities/crash_scene/)

Ezine Articles Forensic Ballistics Recovering Hidden Serial Numbers from Firearms

<http://ezinearticles.com/?Forensic-Ballistics---Recovering-Hidden-Serial-Numbers-From-Firearms&id=917211>

Forensic Science Timeline Rudin Inman

<http://www.forensicsdna.com/Timeline020702.pdf>

Forensic Scientists A Career in the Crime Lab Dillon

<http://www.bls.gov/opub/ooq/1999/Fall/art01.pdf>

Forensics CSI The Experience Web Adventures

<http://forensics.rice.edu/>

Google Video: How to Commit the Perfect Murder

<http://video.google.com/videoplay?docid=-1807566009355608301>

Hairs Fibers Crime and Evidence Deedrick

<http://www.fbi.gov/hq/lab/fsc/backissu/july2000/deedrick.htm>

Howstuffworks Forensics Solving Arson Crimes

<http://videos.howstuffworks.com/hsw/11816-forensics-solving-arson-crimes-video.htm>

Howstuffworks How Fingerprinting Works

<http://science.howstuffworks.com/fingerprinting.htm>

Howstuffworks How Forensic Lab Techniques Work

<http://science.howstuffworks.com/forensic-lab-technique.htm>

Howstuffworks Tech JFK Assassination in New Light

<http://videos.howstuffworks.com/discovery/34441-tech-jfk-assassination-in-new-light-video.htm>

Investigation Discovery Extreme Forensics Missing Victim (Parts 1 and 2)

<http://investigation.discovery.com/videos/extreme-forensics-missing-victim-part-1.html>

<http://investigation.discovery.com/videos/extreme-forensics-missing-victim-part-2.html>

Investigation Discovery Extreme Forensics Serial Murders (Parts 1 to 3)

<http://investigation.discovery.com/videos/extreme-forensics-serial-murders-part-1.html>

<http://investigation.discovery.com/videos/extreme-forensics-serial-murders-part-2.html>

<http://investigation.discovery.com/videos/extreme-forensics-serial-murders-part-3.html>

Investigation Discovery Extreme Forensics Who Killed Misty (Parts 1 and 2)

<http://investigation.discovery.com/videos/extreme-forensics-who-killed-misty-part-1.html>

<http://investigation.discovery.com/videos/extreme-forensics-who-killed-misty-part-2.html>

MSNBC Tech Puts JFK Conspiracy Theories to Rest

<http://www.msnbc.msn.com/id/27705829/>

New York Times Popular Science Forensic Science

<http://video.nytimes.com/video/2009/05/11/science/1194840138954/popular-science.html>

Reachoutmichigan Fingerprinting A Lesson on Classification

<http://www.reachoutmichigan.org/funexperiments/agesubject/lessons/prints.html>

Science Daily Bullet Evidence Challenges Findings in JFK Assassination

<http://www.sciencedaily.com/releases/2007/05/070517142528.htm>

Science Daily Neutron Activation Analysis Proves Oswald Acted Alone

<http://www.sciencedaily.com/releases/2004/10/041025131255.htm>

Science Olympiad Forensics Notes Worksheets Lesson Plans

[http://soinc.org/forensics\\_notes](http://soinc.org/forensics_notes)

Shodor Forensic Science Activities Experiments

<http://www.shodor.org/ssep/stu/activities/forensic.html>

Teachers Domain Lesson Plan DNA Fingerprints

[http://www.teachersdomain.org/resource/tdc02.sci.life.gen.lp\\_dnamysteries/](http://www.teachersdomain.org/resource/tdc02.sci.life.gen.lp_dnamysteries/)

Thinkquest Forensic Science Lesson Plans

<http://library.thinkquest.org/04oct/00206/lesson.htm>

Thinkquest Forensic Science Let the Evidence Reveal the Truth

<http://library.thinkquest.org/04oct/00206/index1.htm>

TruTV Forensics in the Classroom

[http://www.trutv.com/forensics\\_curriculum/](http://www.trutv.com/forensics_curriculum/)

### Wepaper Bloodstain Science

[http://www.wepapers.com/Papers/42305/Blood\\_Basics\\_&%C2%A0Bloodstain%C2%A0Science\\_Card\\_-\\_Lesson\\_plan](http://www.wepapers.com/Papers/42305/Blood_Basics_&%C2%A0Bloodstain%C2%A0Science_Card_-_Lesson_plan)

### YouTube: Chemistry 113 Forensic Science (Chapters 4, 14, and 15)

<http://www.youtube.com/watch?v=06p-Hydh8xM&feature=Playlist&p=89100A7A07F67C3B&index=4>

<http://www.youtube.com/watch?v=93eLPAaVBEQ&feature=Playlist&p=89100A7A07F67C3B&index=21>

<http://www.youtube.com/watch?v=VuD-tNtH9Vo&feature=Playlist&p=89100A7A07F67C3B&index=22>

### YouTube: Forensic Science Timeline

<http://www.youtube.com/watch?v=TbuTirBdZjQ>

## Electricity Online Resources

### All About Circuits Series and Parallel Circuits Table of Contents

[http://www.allaboutcircuits.com/vol\\_1/chpt\\_5/1.html](http://www.allaboutcircuits.com/vol_1/chpt_5/1.html)

### All Around the House Home Heating Options 2007

[http://www.allaroundthehouse.com/lib\\_ghi.h5.htm](http://www.allaroundthehouse.com/lib_ghi.h5.htm)

### Amnesty International's Concerns about Tasers

[http://www.amnesty.ca/themes/tasers\\_backgrounder.php](http://www.amnesty.ca/themes/tasers_backgrounder.php)

### Canada Science and Technology Museum Background Information for Electricity

[http://www.sciencetech.technomuses.ca/english/schoolzone/Info\\_Electricity.cfm](http://www.sciencetech.technomuses.ca/english/schoolzone/Info_Electricity.cfm)

### CBC Chicago Study Calls Taser's Safety Claims into Question

<http://www.cbc.ca/world/story/2008/01/30/taser-study.html>

### CCOHS How Do I Work Safely with Flammable and Combustible Liquids Static Electricity

[http://www.ccohs.ca/oshanswers/prevention/flammable\\_static.html](http://www.ccohs.ca/oshanswers/prevention/flammable_static.html)

### Eartheasy Energy Efficient Lighting

[http://www.eartheasy.com/live\\_energyeff\\_lighting.htm](http://www.eartheasy.com/live_energyeff_lighting.htm)

### Electrical Safety Foundation International

<http://esfi.org/>

### Howstuffworks How Electricity Works

<http://science.howstuffworks.com/electricity.htm>

### HSE Electrical Safety at Work

<http://www.hse.gov.uk/electricity/>

### JLab Static Electricity PowerPoint

[http://education.jlab.org/jsat/powerpoint/0708\\_static\\_electricity.ppt](http://education.jlab.org/jsat/powerpoint/0708_static_electricity.ppt)

### Leader Post SaskPower Offers Rebate for Electrical Consumption Monitor

<http://www.leaderpost.com/life/SaskPower+offers+rebate+electric+consumption+monitor/1585879/story.html>

Living With My Home Heating Options

<http://www.livingwithmyhome.com/diy-do-it-yourself/home-heating-options.aspx>

Manser Physics Electricity 1 Static Electricity PowerPoint

<http://www.m-manser-physics.co.uk/1a%20static%20ELECTRICITY.ppt>

Natural Resources Canada Personal Residential EnerGuide Energy Star and R-2000

<http://oee.nrcan.gc.ca/residential/energystar-energuide-r2000.cfm?attr=4>

Natural Resources Canada Personal Residential Your Key to Electricity Savings

<http://oee.nrcan.gc.ca/publications/equipment/real-time-feedback.cfm?attr=4>

Nova Scotia Power Calculate Your Home Energy Costs

[http://www.nspower.ca/en/home/energyefficiency/Energy\\_Calculator.aspx](http://www.nspower.ca/en/home/energyefficiency/Energy_Calculator.aspx)

One Million Acts of Green Install a Real-Time Electricity Cost Monitor in your Home

<http://green.cbc.ca/Act.aspx?actID=54>

Ontario Tenants Energy Conversation and Saving Money on your Next Electricity Bill

[http://www.ontariotenants.ca/apartment\\_living/electricity-savings.phtml](http://www.ontariotenants.ca/apartment_living/electricity-savings.phtml)

OpAmp Electronics DC Theory Table of Contents

[http://www.opamp-electronics.com/tutorials/dc\\_theory.htm](http://www.opamp-electronics.com/tutorials/dc_theory.htm)

R2000 Manitoba Various Options for Home Heating Systems

[http://www.r2000manitoba.com/heating\\_heat\\_dist2.shtml](http://www.r2000manitoba.com/heating_heat_dist2.shtml)

School for Champions Uses for Static Electricity Pollution Xerography

[http://www.school-for-champions.com/science/static\\_uses.htm](http://www.school-for-champions.com/science/static_uses.htm)

Science Made Simple Static Electricity

<http://www.sciencemadesimple.com/static.html>

Scribd GL Energy Seminar 4 Reducing Electricity Consumption

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