



**TFS High School**  
 5635 Yong St. Suite 206,  
 Toronto, Ontario M2M 3S9

**Course Outline**  
**Science, Grade 9, Academic (SNC1D)**

<b>Department</b>	Science
<b>Instructor</b>	Farah Mazidi
<b>Course Development Date</b>	September 2015
<b>Ministry Course Code</b>	SNC1D
<b>Credit Value</b>	1.00
<b>Ministry Curriculum Document</b>	<b>The Ontario Curriculum, Grades 9 and 10: Science, 2008 (revised)</b>  <a href="http://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf">http://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf</a>
<b>Prerequisites</b>	None
<b>Course Revision Date (TFS)</b>	November 2020

## COURSE DESCRIPTION:

This course enables students to develop their understanding of basic concepts in biology, chemistry, earth and space science, and physics, and to relate science to technology, society, and the environment. Throughout the course, students will develop their skills in the processes of scientific investigation. Students will acquire an understanding of scientific theories and conduct investigations related to sustainable ecosystems; atomic and molecular structures and the properties of elements and compounds; the study of the universe and its properties and components; and the principles of electricity.

## OVERALL CURRICULUM EXPECTATIONS

<b>A. Scientific Investigation Skills and Career Exploration</b>	
A1	Demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analyzing and interpreting, and communicating);
A2	Identify and describe a variety of careers related to the fields of science under study, and identify scientists, including Canadians, who have made contributions to those fields.
<b>B. Biology: Sustainable Ecosystems</b>	
B1	Assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts;
B2	Investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems;
B3	Demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems.
<b>C. Chemistry: Atoms, Elements, and Compounds</b>	
C1	Assess social, environmental, and economic impacts of the use of common elements and compounds, with reference to their physical and chemical properties;
C2	Investigate, through inquiry, the physical and chemical properties of common elements and compounds;
C3	Demonstrate an understanding of the properties of common elements and compounds, and of the organization of elements in the periodic table.
<b>D. Earth and Space Science: The Study of the Universe</b>	
D1	Assess some of the costs, hazards, and benefits of space exploration and the contributions of Canadians to space research and technology;
D2	Investigate the characteristics and properties of a variety of celestial objects visible from Earth in the night sky;
D3	Demonstrate an understanding of the major scientific theories about the structure, formation, and evolution of the universe and its components and of the evidence that supports these theories.
<b>E. Physics: The Characteristics of Electricity</b>	
E1	Assess some of the costs and benefits associated with the production of electrical energy from renewable and non-renewable sources, and analyse how electrical efficiencies and savings can be achieved, through both the design of technological devices and practices in the home;

E2	Investigate, through inquiry, various aspects of electricity, including the properties of static and current electricity, and the quantitative relationships between potential difference, current, and resistance in electrical circuits;
E3	Demonstrate an understanding of the principles of static and current electricity.

## UNITS, DESCRIPTION, and TIME

- Lecture

- demonstration

- Assignment

<p><b>Biology: Sustainable Ecosystems</b> Students will demonstrate an understanding of the dynamic nature of ecosystems and their ability to respond, within limits, while maintaining their ecological balance. They will also assess society's responsibility to regulate their impact on the sustainability of ecosystems in order to preserve them for future generations.</p>	30 hours
<p><b>Chemistry: Atoms, Elements, and Compounds</b> Students will investigate the specific physical and chemical properties of elements and compounds that can be used to determine their practical uses. They will also demonstrate an understanding that elements and compounds have both positive and negative effects on society and the environment.</p>	30 hours
<p><b>Earth and Space: The Study of the Universe</b> Students will demonstrate an understanding that different types of celestial objects in the solar system and universe have distinct properties that can be investigated and quantified. They will investigate how people use observational evidence of the properties of the solar system and the universe to develop theories to explain their formation and evolution. Students will also evaluate the enormous cost of space exploration that has generated valuable knowledge of the solar system and universe.</p>	24 hours
<p><b>Physics: The Characteristics of Electricity</b> Students will demonstrate an understanding that electricity is a form of energy produced from a variety of non-renewable and renewable sources. They will investigate the distinct properties of static and current electricity that determine how they are used. Students will also evaluate the social, economic, and environmental implications of the production and consumption of electrical energy.</p>	24 hours
<b>Final Assessment</b>	
<p><b>Exam</b> This is a proctored exam worth 30% of your final grade.</p>	2 hours
<b>Total</b>	<b>110 hours</b>

## TEACHING AND LEARNING STRATEGIES

Along with some of the strategies noted in the assessment for, as, and of learning charts below, strategies will include (but not limited to):

- Discussion
- Problem posing
- Brainstorming
- Mathematical problem solving
- Homework
- Critical thinking
- Investigative Inquiry
- Lab report
- Note making

### STRATEGIES FOR ASSESSMENT AND EVALUATION OF STUDENT PERFORMANCE:

Assessment as Learning	Assessment for Learning	Assessment of Learning
<p><b>Student Product</b></p> <p>-Learning Logs (anecdotal) Quizzes (scale/rubric)</p>	<p><b>Student Product</b></p> <p>Assignment Quizzes (scale/rubric) Reports(rubric) Entrance Ticket/Exit Card</p>	<p><b>Student Product</b></p> <p>Assignment(s) Tests(scale/rubric) Exam (marking scheme) Research Reports(rubric) Lab report</p>
<p><b>Observation</b></p> <p>Peer feedback Daily website work Goal setting/Revising</p>	<p><b>Observation</b></p> <p>Whiteboard work Class Discussions (anecdotal) PowerPoint presentations (rubric)</p>	<p><b>Observation</b></p> <p>PowerPoint presentation (rubric) Lab report investigation process(checklist)</p>
<p><b>Conversation</b></p> <p>Small Group Discussions (checklist) Pair work (checklist) Conferencing</p>	<p><b>Conversation</b></p> <p>Small Group Discussions (checklist) Pair work (checklist) Peer feedback (anecdotal) Oral quizzes (scale/rubric)</p>	<p><b>Conversation</b></p> <p>Question and Answer Sessions(checklist) Oral tests (scale/rubric) Conversation to probe product pieces</p>

### ASSESSMENT STRATEGIES:

Quiz	Report	Presentation	Extended Investigations
Test (diagnostic)	Skills Checklist	Interview	Project

### THE FINAL GRADE

For a full explanation, please refer to Success. Term work: 70%	<p><b>17.5%</b> Knowledge &amp; Understanding: subject-specific content acquired (knowledge), and the comprehension of its meaning and significance (understanding).</p> <p><b>17.5 %</b> Application: the use of knowledge and skills to make connections within and between various contexts.</p> <p><b>17.5 %</b> Thinking: the use of critical and creative thinking skills and/or processes.</p> <p><b>17.5 %</b> Communication: the conveying of meaning through various forms (oral, visual, and/or written).</p>
Final Exam: 30%	<p><b>30%</b> Exam (1 hour exam within a 1.5 hour time slot)</p> <p>- consisting of a variety of question types (e.g., short answer, multiple choice, extended response, problem solving, etc.); completed during exam time period; individual student effort; evaluated by teacher</p>
Your final grade will be calculated by combining your Term (70%) grade and your Exam and Performance Task Evaluations (30%).	

## Resources

- On Science 9, Nelson, Blake, Mazza, Mills, Mustoe, Ross, Stiff
- [https://video.search.yahoo.com/search/video;\\_ylt=A0geK9qOm01eAlwAOgpXNyoA;\\_ylu=X3oDMTE0NTg2bDUxBGNvbG8DYmYxBHBvcwMxBHZ0aWQDQjI5NDRfMQRzZWMDcGI2cw--?p=Science+9+videos&fr2=piv-web&fr=mcafee#id=13&vid=c67dd2a3a975ff38464d00ff0f53281b&action=view](https://video.search.yahoo.com/search/video;_ylt=A0geK9qOm01eAlwAOgpXNyoA;_ylu=X3oDMTE0NTg2bDUxBGNvbG8DYmYxBHBvcwMxBHZ0aWQDQjI5NDRfMQRzZWMDcGI2cw--?p=Science+9+videos&fr2=piv-web&fr=mcafee#id=13&vid=c67dd2a3a975ff38464d00ff0f53281b&action=view)
- Atoms and Molecules Videos
- <https://slideplayer.com/slide/8528694/>
- Ecosystem and sustainability

### *The Ontario Curriculum, Grades 9 and 10: Science, 2008 (revised)*

The Ontario Curriculum Grades 9 and 10, 2008 Revised Science

[http://www.edu.gov.on.ca/eng/curriculum/secondary/science910\\_2008.pdf](http://www.edu.gov.on.ca/eng/curriculum/secondary/science910_2008.pdf)

## ACHIEVEMENT CHART: SCIENCE, GRADES 9-12

Category	50-59% (Level 1)	60-69% (Level 2)	70-79% (Level 3)	80-100% (Level 4)
<b>Knowledge and Understanding</b> - Subject-specific content acquired in each course (knowledge), and the comprehension of its meaning and significance (understanding)				
	The student:			
understanding of concepts, principles, laws, and theories (e.g., identifying assumptions; eliminating misconceptions; providing explanations)	demonstrates limited understanding of concepts, principles, laws, and theories	demonstrates some understanding of concepts, principles, laws, and theories	demonstrates considerable understanding of concepts, principles, laws, and theories	demonstrates thorough understanding of concepts, principles, laws, and theories
knowledge of facts and terms	demonstrates limited knowledge of facts and terms	demonstrates some knowledge of facts and terms	demonstrates considerable knowledge of facts and terms	demonstrates thorough knowledge of facts and terms
transfer of concepts to new contexts	infrequently transfers simple concepts to new contexts	sometimes transfers simple concepts to new contexts	usually transfers simple concepts to new contexts	routinely transfers simple concepts to new contexts
understanding of relationships between concepts	demonstrates limited understanding of relationships between concepts	demonstrates some understanding of relationships between concepts	demonstrates considerable understanding of relationships between concepts	demonstrates thorough and insightful understanding of relationships between concepts
<b>Thinking and Inquiry</b> - The use of critical and creative thinking and inquiry skills and/or processes				
	The student:			
application of the skills and strategies of scientific inquiry (e.g., initiating	applies few of the skills and strategies of scientific inquiry	applies some of the skills and strategies of scientific inquiry	applies most of the skills and strategies of scientific inquiry	applies all or almost all of the skills and strategies of scientific inquiry

and planning, performing and recording, analysing and interpreting, problem solving)				
application of technical skills and procedures (e.g., microscopes)	applies technical skills and procedures with limited competence	applies technical skills and procedures with moderate competence	applies technical skills and procedures with considerable competence	applies technical skills and procedures with a high degree of competence
use of tools, equipment, and materials	uses tools, equipment, and materials safely and correctly only with supervision	uses tools, equipment, and materials safely and correctly with some supervision	uses tools, equipment, and materials safely and correctly	demonstrates and promotes the safe and correct use of tools, equipment, and materials

**Communication** - The conveying of meaning through various forms

	The student:			
communication of information and ideas	communicates information and ideas with limited clarity and precision	communicates information and ideas with some clarity and precision	communicates information and ideas with considerable clarity and precision	communicates information and ideas with a high degree of clarity and precision
use of scientific terminology, symbols, conventions, and standard (SI) units	uses scientific terminology, symbols, conventions, and SI units with limited accuracy and effectiveness	uses scientific terminology, symbols, conventions, and SI units with some accuracy and effectiveness	uses scientific terminology, symbols, conventions, and SI units with considerable accuracy and effectiveness	uses scientific terminology, symbols, conventions, and SI units with a high degree of accuracy and effectiveness
communication for different audiences and purpose	communicates with a limited sense of audience and purpose	communicates with some sense of audience and purpose	communicates with a clear sense of audience and purpose	communicates with a strong sense of audience and purpose
use of various forms of communication (e.g., reports, essays)	demonstrates limited command of the various forms	demonstrates moderate command of the various forms	demonstrates considerable command of the various forms	demonstrates extensive command of the various forms
use of information technology for scientific purposes (e.g., specialized databases)	uses technology with limited appropriateness and effectiveness	uses technology with moderate appropriateness and effectiveness	uses appropriate technology with considerable effectiveness	uses appropriate technology with a high degree of effectiveness

**Application** - The use of knowledge and skills to make connections within and between various contexts

	The student:			
understanding of connections among science, technology, society, and the environment	shows limited understanding of connections in familiar contexts	shows some understanding of connections in familiar contexts	shows considerable understanding of connections in familiar and some unfamiliar contexts	shows thorough understanding of connections in familiar and unfamiliar contexts
analysis of social and economic issues involving science and technology	analyses social and economic issues with limited effectiveness	analyses social and economic issues with moderate effectiveness	analyses social and economic issues with considerable effectiveness	analyses complex social and economic issues with a high degree of effectiveness
assessment of impacts of science and technology on the environment	assesses environmental impacts with limited effectiveness	assesses environmental impacts with moderate effectiveness	assesses environmental impacts with considerable effectiveness	assesses environmental impacts with a high degree of effectiveness
proposing of courses of practical action in relation to science and technology-based problems	extends analyses of familiar problems into courses of practical action with limited effectiveness	extends analyses of familiar problems into courses of practical action with moderate effectiveness	extends analyses of familiar problems into courses of practical action with considerable effectiveness	extends analyses of familiar and unfamiliar problems into courses of practical action with a high degree of effectiveness

## Learning Skills:

Learning Skills are skills and habits are essential to success in school and in the workplace. Teachers report achievement on the six Learning Skills in the table below using letter codes:  
E = Excellent      G = Good      S = Satisfactory      N = Needs Improvement.

Learning Skills	Sample Behaviors
Responsibility	The student fulfils responsibilities and commitments within the learning environment; completes and submits class work, homework, and assignments according to agreed-upon timelines; takes responsibility for and manages own behavior.
Organization	The student devises and follows a plan and process for completing work and tasks; establishes priorities and manages time to complete tasks and achieve goals; identifies, gathers, evaluates, and uses information, technology, and resources to complete tasks.
Independent Work	The student independently monitors, assesses, and revises plans to complete tasks and meet goals; uses class time appropriately to complete tasks; follows instructions with minimal supervision.
Collaboration	The student accepts various roles and an equitable share of work in a group; responds positively to the ideas, opinions, values, and traditions of others; builds healthy peer-to-peer relationships through personal and media-assisted interactions; works with others to resolve conflicts and build consensus to achieve group goals; shares information, resources, and expertise and promotes critical thinking to solve problems and make decisions.
Initiative	The student looks for and acts on new ideas and opportunities for learning; demonstrates the capacity for innovation and a willingness to take risks; demonstrates curiosity and interest in learning; approaches new tasks with a positive attitude; recognizes and advocates appropriately for the rights of self and others.
Self-Regulation	The student sets own individual goals and monitors progress towards achieving them; seeks clarification or assistance when needed; assesses and reflects critically on own strengths, needs, and interests; identifies learning opportunities, choices, and strategies to meet personal needs and achieve goals; perseveres and makes an effort when responding to challenges.

## PLAGIARISM/CHEATING:

Plagiarism is a serious offense. It is defined as taking words, phrasing, sentence structure, or any other element of the expression of another person's ideas, and using them as if they were your own. Plagiarism is a violation of another person's rights, whether the material taken is significant or small.

Students will be assisted in developing strategies and techniques to avoid plagiarism. They need to be aware that cheating and plagiarized term work will be penalized and could result in a mark of zero. another person's rights, whether the material taken is significant or small.

## PROGRAM PLANNING CONSIDERATIONS FOR SCIENCE

Teachers planning a program in Science must take into account considerations in a number of important areas. Essential information that pertains to all disciplines is provided in the companion piece to this document, *Science. The Ontario Curriculum, Grades 11 and 12: Some Considerations for Program Planning, 2008*. The areas of concern to all teachers include the following:

- I. ***The Role of Technology in the Curriculum.*** Using information technology will assist students in the achievement of many of the expectations in the curriculum regarding research, written work, analysis of information, and visual presentations.

- II. English As a Second Language (ESL):* Appropriate accommodations in teaching, learning, and evaluation strategies will be made to help ESL students gain proficiency in English, since students taking ESL at the secondary level have limited time in which to develop this proficiency.
- III. Career Education:* Expectations in this course include many opportunities for students to explore educational and career options, and to become self-directed learners.
- IV. Health and Safety in Science*
- V. Environmental Education*
- VI. Critical Thinking and Critical Literacy in Science*
- VII. Literacy, Mathematical Literacy, and Investigation (Inquiry/Research) Skills*