TORONTO WORLD SCHOOL

The World School Network

# COURSE OUTLINE

**Department:** SCIENCE

**Course Developer:** Simon Gallo

**Course Development Date:** January 2024

**Course Reviser/ Revision Date:** Jenn Lind, September 2025

**Course Title/ Grade/ Type:** Science / Grade 9 / De-streamed

**Course Code:** SNC1W

**Credit:** 1.00

**Total Hours:** 110 hours

**Policy Document:** The Grade 9 Science Course, 2022

**Growing Success:** Assessment Evaluation and Reporting in Ontario Schools, First Edition Covering Grades 1-12 (2010)

**Prerequisite:** None

## Course Description

This course enables students to develop their understanding of basic concepts in biology, chemistry, physics and Earth and space science, and to relate science to technology, society, and the environment. Throughout the course, students will develop and refine the STEM skills as they use scientific research, scientific experimentation, and engineering design processes to investigate concepts and apply their knowledge in situations that are relevant to their lives and communities. Student will continue to develop transferable skills as they become scientifically literate global citizens

### Overall Expectations

### A. STEM Skills, Careers, and Connections

This strand focuses on science, technology, engineering, and mathematics (STEM) investigation skills, practical applications of science, connections between science and various careers, and contributions to the development of science from people with diverse lived experiences. The learning related to this strand takes place in the context of learning in the Biology, Chemistry, Physics and Earth and Space Science strands.

Throughout this course, in connection with the learning in the Biology, Chemistry, Physics and Earth and Space Science strands, students will:

A1. STEM Investigation Skills – apply scientific processes and an engineering design process in their investigation to develop a conceptual understanding of the science they are learning, and apply coding skills to model scientific concepts and relationships

A2. Applications, Careers, and Connections – analyse how scientific concepts and processes can be applied in practical ways to address real-world issues and in various careers, and describe contributions to sicnece from people with diverse lived experiences

### B. Biology – Sustainable Ecosystems and Climate Change

In this strand, students integrate learning from Strand A as they investigate concepts, develop and apply skills, and make meaningful connections to their lives, their communities, and the environment

By the end of this course, students will:

B1. Relating Science to Our Changing World – assess impacts of climate change on ecosystem sustainability and on various communities, and describe ways to mitigate these impacts

B2. Investigation and Understanding Concepts – demonstrate an understanding of the dynamic and interconnected nature of ecosystems, including how matter cycles and energy flows through ecosystems

### C. Chemistry – The Nature of Matter

In this strand, students integrate learning from Strand A as they investigate concepts, develop and apply skills, and make meaningful connections to their lives, their communities, and the environment

By the end of this course, students will:

C1. Relating Science to Our Changing World – assess social, environmental, and economic impacts of the use of elements, compounds, and associated technologies

C2. Investigating and Understanding Concepts – demonstrate an understanding of the nature of matter, including the structure of the atom, physical and chemical properties of common elements and compounds, and the organization of elements in the periodic table

**D. Physics – Principles and Applications of Electricity**

In this strand, students integrate learning from Strand A as they investigate concepts, develop and apply skills, and make meaningful connections to their lives, their communities, and the environment

By the end of this course, students will:

D1. Relating Science to Our Changing World – assess social, environmental, and economic impacts of electrical energy production and consumption, and describe ways to achieve sustainable practices

D2. Investigating and Understanding Concepts – demonstrate an understanding of the nature of electric charges, including properties of static and current electricity

**E. Earth and Space Science – Space Exploration**

In this strand, students integrate learning from Strand A as they investigate concepts, develop and apply skills, and make meaningful connections to their lives, their communities, and the environment

By the end of this course, students will:

E1. Relating Science to Our Changing World – evaluate social, environmental, and economic impacts of space exploration and of technological innovations derived from space exploration

E2. Investigating and Understanding Concepts – demonstrate an understanding of the components, characteristics, and associated phenomena of the solar system and the universe, and the importance of the Sun to processes on Earth

## OUTLINE OF COURSE CONTENT

| UNIT | UNIT DESCRIPTION | HOURS |
|---|---|---|
| **U1: Biology Sustainable Ecosystems and Climate Change** | In this comprehensive unit, students will delve into the intricate dynamics of ecosystems.They will explore the flow of energy, nutrient cycling, and the intricate interactions among diverse organisms. A key focus will be on understanding the fundamental functioning of ecosystems and recognizing the critical role of biodiversity in maintaining ecological balance. | 25.5<br><br>(6) Lessons |

| | | |
|---|---|---|
| **U2: Chemistry** | In this engaging unit, students will delve into the significance of chemistry in their daily lives, with a specific focus on the utilization and responsible disposal of elements and compounds present in common products. Throughout this unit, students will gain valuable insights into the role of chemistry in shaping our everyday experiences and the importance of making informed choices to promote sustainability and environmental responsibility. | 23.5<br><br>(6) Lessons |
| **U3: Physics** | Throughout this unit, students will gain a comprehensive understanding of the profound impacts of electrical energy production and consumption on both society and the environment. The unit will further emphasize the exploration of intricate relationships between various characteristics of electricity, providing students with a holistic perspective on this fundamental aspect of our modern world. | 24.5<br><br>(5) Lessons |
| **U4: Earth and Space Science** | In this engaging unit, students explore the composition of the Sun, its captivating phenomena, and its crucial role in sustaining life on our planet. Furthermore, they delve into the intriguing components of our Solar System, investigating its origin theory and gaining insights into the characteristics of planets and galaxies. As an added dimension, they also examine the fascinating ways in which humans explore space. By the end of this unit, students will have a deepened understanding of these captivating topics and their interconnectedness within the universe. | 25.5<br><br>(6) Lessons |
| **Final Culminating Evaluations** | Assessment Of Learning - Culminating Activity<br>Assessment Of Learning - Final Exam | 11 |
| **Total Hours** | | 110 |

## TEACHING STRATEGIES

| **Strategies marked with "x" are used in the course.** | | | |
|---|---|---|---|
| Direct Instruction | X | Teacher modeling | X |
| Class Activity | X | Use of Computers/Internet | X |
| Worksheets/Surveys | X | Journaling | X |
| Individual or Group Research | X | Reflecting on Strategies | X |
| Conferencing Teacher & Student | X | Personal Response | X |
| Interactive Labs & Simulations | X | Brainstorming | X |
| Silent individual reading | X | Editing/Revision | X |
| Class Activity | X | Use of Video and Audio materials | X |

| | | | |
|---|---|---|---|
| Independent Work | X | | |

**Strategies for Assessment and Evaluation of Student Performance**

Diagnostic assessment is used at the beginning of a unit to assist in determining a starting point for instruction. Assessment for Learning (AFL) provides information to students as they are learning and refining their skills. Assessment as Learning (AAL) acts as a stepping-stone for students to begin applying their understanding using critical thinking; it bridges the gap between AFL and AOL. Assessment of Learning (AOL), at the end of units and course, provides students with the opportunity to synthesize/apply/demonstrate their learning and the achievement of the expectations. The following is a list of specific assessment/evaluation strategies that the teacher may use but is not limited to.

**Assessment and Evaluation**

Evaluation in this course will be continuous throughout the year and will include a variety of evaluation methods. The tools highlighted in yellow will be used for the three different types of assessments:

| Assessment as Learning | Assessment for Learning | Assessment of Learning |
|---|---|---|
| **Student Product**<br>**Journals/Letters/Emails (checklist)**<br>**Learning Logs (anecdotal)**<br>**Learning Goals (Checklist)**<br>**Entrance tickets**<br>**Exit tickets** | **Student Product**<br>**Assignment**<br>**Journals/Letters/Emails (checklist)**<br>**Pre-tests (scale/rubric)**<br>**Peer feedback (anecdotal/checklist)**<br>**Entrance ticket**<br>**Vocabulary notebooks (anecdotal)** | **Student Product**<br>**Assignment**<br>**Journals/Letters/Emails (checklist)**<br>**Tests (scale/rubric)**<br>**Exam**<br>**Reports (rubric)**<br>**Essays (rubric)** |
| **Observation**<br>**Whole class discussions (anecdotal)**<br>**Self-proofreading (checklist)** | **Observation**<br>**Class discussions (anecdotal)**<br>**Debate (rubric)**<br>**Performance tasks (anecdotal/scale)** | **Observation**<br>**PowerPoint presentations (rubric)**<br>**Performance tasks (anecdotal/scale)** |
| **Conversation**<br>**Student teacher conferences (checklist)**<br>**Small Group Discussions (checklist)** | **Conversation**<br>**Student teacher conferences**<br>**(checklist)**<br>**Small group discussions** | **Conversation**<br>**Student teacher conferences (checklist)**<br>**Question and Answer Session (checklist)** |

| | | |
|---|---|---|
| ☐ **Pair work (checklist)** | **(checklist)**<br>☐ **Pair work (anecdotal)**<br>☐ **Peer-feedback (anecdotal)**<br>☐ **Peer-editing (anecdotal)**<br>☐ **Oral pre-tests (scale/rubric)** | ☐ **Oral tests (scale/rubric)** |

| **Online Activities (within LMS)** | **Offline Activities** |
|---|---|
| Watching video lectures<br>Watching additional resource videos<br>Completing interactive activities<br>Communicating with teachers<br>Participating in virtual conferences<br>Completing online quizzes<br>Reviewing peer submissions<br>Submitting all AAL, AFL, & AOL Assessment and Evaluations | Reading materials for the course<br>Reviewing materials for the course<br>Completing assignments<br>Completing practice activities<br>Preparing presentations<br>Reviewing for exams and unit tests<br>Researching topics on the internet<br>Recording and producing presentations<br>Practicing processes and skills<br>Completing proctored unit tests and exams |

**The Final Grade:**

The percentage grade represents the quality of the students' overall achievement of the expectations for the course and reflects the corresponding achievement as described in the achievement chart for Science. The distribution of marks into a grade is based on the departmental assessment and evaluation guide for the course and will reflect the student's most consistent level of achievement where appropriate. Comments on the development of learning skills and contributions to the course will be provided on reports. Term work will be 70% of the overall grade for the course; the final evaluation will be 30% of the overall grade.

| **Assessment and Percentage of Final Mark** | |
|---|---|
| **(Term) 70%** | Unit 1 Assignment: (7**%**) [Student Product]<br>Unit 1 Test: (8%) [Student Product] |
| | Unit 2 Test: (12**%**) [Student Product]<br>Unit 2 Student/Teacher Conference: (9%) [Conversation] |
| | Unit 3 Project/Assignment: (9**%**) [Student Product]<br>Unit 3 Student/Teacher Conference: (9%) [Conversation] |

| | |
|---|---|
| | Unit 4 Assignment: (8**%**) [Student Product]<br>Unit 4 Presentation:(8%) [Observation] |
| **(Final) 30%** | Final Exam (15**%**) [Student Product]<br>Culminating Activity (1**5%**) [Student Product/Observation] |

- **Each Assessment of Learning (AoL) will be broken into the following categories and given the following weights: Knowledge/Understanding (25%), Inquiry/Thinking (25%), Communication (25%), and Application/Making Connections (25%).**

**Assessment of Learning Skills & Work Habits:**

The following learning skills and work habits will be fostered throughout this course and assessed on the report card: responsibility, organization, independent work, collaboration, initiative, self-regulation. These skills will not be included as part of the final mark unless they are identified in the provincial curriculum expectations for the course. However, it is important to remember that the development of these skills is critical to daily academic success and individual growth.

The following chart indicates the skills and look-fors for each student.

| Learning Skills and Work Habits | E – Excellent G – Good S – Satisfactory N – Needs Improvement |
|---|---|
| **Responsibility** | **Organization** |
| ▪ Fulfils responsibilities and commitments within the learning environment.<br>▪ Completes and submits class work, homework, and assignments according to agreed-upon timelines.<br>▪ Takes responsibility for and manages own behaviour. | ▪ Devises and follows a plan and process for completing work and tasks.<br>▪ Establishes priorities and manages time to complete tasks and achieve goals.<br>▪ Identifies, gathers, evaluates, and uses information, technology, and resources to complete tasks. |
| **Independent Work** | **Collaboration** |
| ▪ Independently monitors, assesses, and revises plans to complete tasks and meet goals.<br>▪ Uses class time appropriately to complete tasks.<br>▪ Follows instructions with minimal supervision. | ▪ Accepts various roles and an equitable share of work in a group.<br>▪ Responds positively to the ideas, opinions, values, and traditions of others.<br>▪ Builds healthy peer-to-peer relationships through personal and media-assisted interactions.<br>▪ Works with others to resolve conflicts and build consensus to achieve group goals.<br>▪ Shares information, resources, and expertise, and promotes critical thinking to solve problems and make decisions. |
| **Initiative** | **Self-Regulation** |
| ▪ Looks for and acts on new ideas and opportunities for learning.<br>▪ Demonstrates the capacity for innovation and a willingness to take risks.<br>▪ Demonstrates curiosity and interest in learning.<br>▪ Approaches new tasks with a positive attitude.<br>▪ Recognizes and advocates appropriately for the rights of self and others. | ▪ Sets own individual goals and monitors progress towards achieving them.<br>▪ Seeks clarification or assistance when needed.<br>▪ Assesses and reflects critically on own strengths, needs, and interests.<br>▪ Identifies learning opportunities, choices, and strategies to meet personal needs and achieve goals.<br>▪ Perseveres and makes an effort when responding to challenges. |

The report card will therefore focus on two distinct but related aspects of student achievement; the achievement of curriculum expectations and the development of learning skills. The report card will contain separate sections for the reporting of these two aspects.

**A Summary Description of Achievement in Each Percentage Grade Range and Corresponding Level of Achievement**

| Percentage Grade Range | Achievement Level | Summary Description |
|---|---|---|
| 80-100% | Level 4 | A very high to outstanding level of achievement. Achievement is *above* the provincial standard. |
| 70-79% | Level 3 | A high level of achievement. Achievement is *at* the provincial standard. |
| 60-69% | Level 2 | A moderate level of achievement. Achievement is *below, but approaching*, the provincial standard. |
| 50-59% | Level 1 | A passable level of achievement. Achievement is *below* the provincial standard. |
| below 50% | Level R | Insufficient achievement of curriculum expectations. A credit will not be granted. |

**Consideration of Program Planning**

**English language learners:** As our school can have multilingual student population, special accommodation will be made to bring a rich diversity of background knowledge and experience to the classroom.
TWS courses can provide a wide range of options to address the needs of ESL/ELD students. Assessment and evaluation exercises will help ESL students in mastering the English language. In addition, since all occupations require employees with a wide range of English skills and abilities, many students will learn how the operation of their own physical world can contribute to their success in their social world. The student whose first language is not English enters Ontario Secondary schools with diverse linguistic and cultural backgrounds. All of these students bring a rich array of background knowledge and experience to the classroom, and all teachers must share in the responsibility for their English-language development. Teachers must incorporate appropriate strategies for instructions and assessment to facilitate the success of the English language learners in their classrooms. These strategies include:

- modification of some or all of the course expectations so that they are challenging but attainable for the learner at his or her present level of English proficiency, given the necessary support from the teacher;
- use of a variety of instructional strategies (e.g., extensive use of visual cues, scaffolding, manipulatives, pictures, diagrams, graphic organizers; attention to clarity of instructions);
- modelling of preferred ways of working in English; previewing of textbooks; pre-teaching of key vocabulary; peer tutoring; strategic use of students' first languages);
- use of a variety of learning resources (e.g., visual material, simplified text, bilingual dictionaries, materials that reflect cultural diversity);
- use of assessment accommodations (e.g., granting of extra time; simplification of language used in problems and instructions; use of oral interviews, learning logs, portfolios, demonstrations, visual representations, and tasks requiring completion of

graphic organizers or cloze sentences instead of tasks that depend heavily on proficiency in English).

**Literacy education:** Communication skills are fundamental to the development of literacy. Fostering students' communication skills is an important part of the teacher's role in the curriculum. When students read they need to understand vocabulary and terminology. Students are encouraged to use language with care and precision in order to communicate effectively. Students are encouraged to ask questions to their peers/teachers and to also be proactive with solving their own questions.

**The role of information and communications technology:** Information and communication technologies (ICT) provide a range of tools that can significantly extend and enrich teachers' instructional strategies and support students' learning. Teachers can use ICT tools and resources both for whole-class instruction and to design programs that meet diverse student needs. Technology can help to reduce the time spent on routine tasks, allowing students to devote more of their efforts to thinking and concept development.
Information technology is considered a learning tool that must be accessed by students when the situation is appropriate. As a result, students will develop transferable skills through their experience with word processing, internet research, and presentation software, as would be expected in any environment.
Technology also makes possible simulations of complex systems that can be useful for problem-solving purposes or when field studies on a particular topic are not feasible.
Information and communications technologies can be used in the classroom to connect students to other schools, at home and abroad, and to bring the global community into the local classroom. Although the Internet is a powerful electronic learning tool, there are potential risks attached to its use. All students must be made aware of issues of Internet privacy, safety, and responsible use, as well as of the ways in which this technology is being abused – for example, when it is used to promote hatred.
Teachers, too, will find the various ICT tools useful in their teaching practice, both for whole class instruction and for the design of curriculum units that contain varied approaches to learning to meet diverse student needs.

**Equity and Inclusive Education:** The TWS equity and inclusive education strategy focuses on respecting diversity, promoting inclusive education, and identifying and eliminating discriminatory biases, systemic barriers, and power dynamics that limit the ability of students to learn, grow, and contribute to society. In an environment based on the principles of inclusive education, all students, parents, caregivers, and other members of the school community - regardless of ancestry, culture, ethnicity, sex, physical or intellectual ability, race, religion, gender identity, sexual orientation, socio-economic status, or other similar factors - are welcomed, included, treated fairly, and respected. Diversity is valued, and all members of the TWS community feel safe, comfortable, and accepted. Every student is supported and inspired to succeed in a culture of high expectations for learning. In an inclusive education system, all students see themselves reflected in the curriculum, their physical surroundings, and the broader environment, so that they can feel engaged in and empowered by their learning experiences. In addition, TWS differentiates the instruction and assessment strategies to take into account the background and experiences, as well as the interests, aptitudes, and learning needs, of all students.

**First Nation, Métis and Inuit Education Policy Framework**
The new First Nation, Métis and Inuit Education Policy Framework is a key part of the strategy. The framework includes approaches for schools and school boards that will boost Aboriginal student achievement, help close the gap in achievement between Aboriginal an non-Aboriginal students, and improving students' literacy and numeracy skills, training teachers in teaching methods that are appropriate for Aboriginal students, and encouraging more parents to get involved in their children's education or school. The framework also sets out strategies to integrate First Nations, Métis and Inuit cultures, histories and perspectives throughout the Ontario curriculum. This will increase knowledge and awareness among all students.

**PLAGIARISM/CHEATING**
Any incident of plagiarism or cheating will result in a resubmission/rewrite of that particular assignment/test at the end of the course on the student's own time and at his/her own expense to pay for the creation and marking of a new assessment. This incident will be documented in the office. A second incident of plagiarism or cheating in <u>any course</u> will result in a mark of zero for that assignment. For example, if you cheat on a math test and then plagiarize an English essay, you will receive a zero on the essay. Cheating is pointless. You are only cheating yourself.

**Missed and Late Assignments Policy**

Teachers will make it Clear to the students and parents/guardians early in the school year that they are responsible not only for their behaviour in the classroom/school but also for providing evidence of their achievement of the overall expectations within the time frame specified by the teacher and in a form approved by the teacher. Students must understand that there will be consequences for not completing assignments for evaluation or for submitting those assignments late. Where in the teacher's professional judgment it is appropriate to do so, a number of strategies will be used to encourage the student to modify his/her behaviour. Some of these may include:

- Asking the student to clarify the reason for not completing the assignment taking into consideration legitimate reasons for missed deadlines.
- Maintaining ongoing communication with students and/or parents about due dates and late assignments, and scheduling conferences with parents if the problem persists.
- Setting up a student contract
- Providing alternative assignments or tests/exams where, in the teacher's professional judgment, it is reasonable and appropriate to do so.
- Deducting marks for late assignments, up to and including the full value of the assignment.

Students and parent/guardians will be informed in a timely fashion via phone call, face to face conference, e-mail and if need be a formal letter about the importance of submitting assignments for evaluation when they are due and about the consequences for students who submit assignments late or fail to submit assignments**. If the above measures have been put into place**

**and the behaviour of the student has not provided sufficient evidence, then 0 will be inserted as the mark for the missed assignment.**

**Resources:**

McGraw-Hill Ryerson ON Science 9 © 2009

Curriculum, Grade 9, Science (2022)

Ministry of Education; Growing Success Documents, 2010

Access to Gizmos and other virtual simulations

Access to YouTube

## Attendance Policy:

Consistent log-in is crucial to a student's success in Toronto World School's online program. The guidelines of the Ministry of Education require that students receive at least 110 hours of scheduled instruction time for each credit course. Attendance patterns will be monitored to ensure a student is actively logging into their course. Students who have not completed the course within 12 months of enrolment will be automatically removed from the course. Only under extenuating circumstances, with proper documentation and the permission of the Principal, can a student be reinstated.

## Acceptable Online Use Policy

Toronto World School uses the ConnectED Integrated Learning Platform and is intended for educational purposes only. The use of this program or any tools within TWS systems, other than for educational purposes, is strictly prohibited. The inappropriate uses include, but are not limited to, criminal, obscene, commercial, cyber-bullying or illegal purposes.
The administration has the right to review all student work in order to determine the appropriateness of computer use. If TWS online programs are deemed to be used inappropriately, the Administration will levy consequences which may include suspensions and/or removal from the program. In some cases, further action may be taken including contacting day schools, legal representation or the police.
Students need to be very vigilant in order to prevent them getting into a situation where they may be suspected for inappropriate use.
Therefore, students are reminded to

- Always protect their passwords and not share them with anyone
- Always inform their teachers of suspicious messages or other incidents that they encounter

- Always only access content that is intended for educational use.

**Hardware/software requirements:**

*Hardware:*

- PC running Windows 8 or higher
- Mac running Apple OS X or higher
- Chromebook running Chrome OS

*High speed internet is recommended with access to a computer with the following:*

- A processor of 2GHz or faster
- 4 GB RAM or greater
- A high speed internet connection of 1.5 MB/s or faster
- Keyboard and mouse
- Headphone/Speakers/Microphone/Camera

*Recommended Software:*

- Adobe Reader, Shockwave, Flash Player, Java, Office suite

*Browser:*

- Mozilla Firefox4 or higher, Internet Explorer 7 or higher, Safari 5 or higher, Google Chrome 11 or higher