



Lawrence Park

3284 Yonge St
Toronto, Ontario

COURSE NAME:	Science, Grade 10, Academic
COURSE CODE:	SNC2D
CREDIT VALUE:	1.0
PREREQUISITE:	Science, Grade 9, Academic or Applied
CURRICULUM POLICY:	<i>Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools, 2010</i> <i>Science: Grades 9 and 10 (Revised 2008)</i>
DEPARTMENT:	Science
DEVELOPED BY:	Mr. Choi
DEVELOPMENT DATE:	
REVISED BY:	Mr. Choi
REVISION DATE:	September, 2013

COURSE DESCRIPTION

This course enables students to enhance their understanding of concepts in biology, chemistry, earth and space science, and physics, and of the interrelationships between science, technology, society, and the environment. Students are also given opportunities to further develop their scientific investigation skills. Students will plan and conduct investigations and develop their understanding of scientific theories related to the connections between cells and systems in animals and plants; chemical reactions, with a particular focus on acid-base reactions; forces that affect climate and climate change; and the interaction of light and matter.

OVERALL CURRICULUM EXPECTATIONS

Scientific Investigation Skills and Career Exploration

Overall Expectations:

By the end of this course, students will be able to:

1. demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating);
2. identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

Biology: Tissues, Organs, and Systems of Living Things

Overall Expectations

By the end of this course, students will:

3. evaluate the importance of medical and other technological developments related to systems biology, and analyse their societal and ethical implications;
4. investigate cell division, cell specialization, organs, and systems in animals and plants, using research and inquiry skills, including various laboratory techniques;
5. demonstrate an understanding of the hierarchical organization of cells, from tissues, to organs, to systems in animals and plants.

Chemistry: Chemical Reactions

Overall Expectations

By the end of this course, students will:

6. analyse a variety of safety and environmental issues associated with chemical reactions, including the ways in which chemical reactions can be applied to address environmental challenges;
7. investigate, through inquiry, the characteristics of chemical reactions;
8. demonstrate an understanding of the general principles of chemical reactions, and various ways to represent them.

Earth and Space Science: Climate Change

Overall Expectations

By the end of this course, students will:

9. analyse some of the effects of climate change around the world, and assess the effectiveness of
10. initiatives that attempt to address the issue of climate change;
11. investigate various natural and human factors that influence Earth's climate and climate change;
12. demonstrate an understanding of natural and human factors, including the greenhouse effect, that influence Earth's climate and contribute to climate change.

Physics: Light and Geometric Optics

Overall Expectations

By the end of this course, students will:

13. evaluate the effectiveness of technological devices and procedures designed to make use of light, and assess their social benefits;
14. investigate, through inquiry, the properties of light, and predict its behaviour, particularly with
15. respect to reflection in plane and curved mirrors and refraction in converging lenses;
16. demonstrate an understanding of various characteristics and properties of light, particularly with respect to reflection in mirrors and reflection and refraction in lenses.

UNITS

Unit	Title	Time
1	Chemical Reactions	25 hrs
2	Light and Geometric Optics	25 hrs
3	Climate Change	25 hrs
4	Tissues, Organs, and Systems of Living Things	25 hrs
5	Careers in Science	10 hrs
	Total:	110 hrs

ACHIEVEMENT CHART

The following table provides 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%		Insufficient achievement of curriculum expectations. A credit will not be granted.

TEACHING AND LEARNING STRATEGIES

Using a variety of instructional strategies, the teacher will provide numerous opportunities for students to develop skills of inquiry, problem solving, and communication as they investigate and learn fundamental concepts. The integration of various aspects of scientific knowledge will provide a powerful tool for reasoning and problem solving, and is reflected in a meaningful blend of both process and content.

Along with some of the strategies noted in the assessment for, as, and of learning charts below, strategies will include:

Activity Based Strategies	Arts Based Strategies	Cooperative Strategies
<ul style="list-style-type: none"> • Activity/Learning Centres • Carousel • Debate • Field Trip • Game • Oral Presentation • Panel Discussion • Rehearsal / Repetition / Practice • Retelling • Simulation • Survey 	<ul style="list-style-type: none"> • Ceremony • Chanting • Choral Reading • Choreography • Collage • Role Playing • Sketching to Learn • Storyboard 	<ul style="list-style-type: none"> • Collaborative • Community Links • Conflict Resolution • Discussion • Interview • Jigsaw • Literature Circles • Mentoring • Peer Teaching • Round Robin • Round Table • Think/Pair/Share
Direct Instruction Strategies	Independent Learning Strategies	Technology and Media Based Applications

<ul style="list-style-type: none"> • Advance Organizer • Book Talks • Cloze • Conferencing • Demonstration • Directed Reading-Thinking Activities • Expository Text Frames • Flash Cards • Guest Speaker • Guided Exploration • Guided Reading • Guided Writing • Lecture • Making Words • Mnemonic Devices • Practice and Drill • Programmed Learning • Prompt • Read Along • Read Aloud • Reciprocal Teaching • Review • Seminar/Tutorial • Socratic Dialogue • Story Mapping • Storytelling • Task Cards • Textbook • Visual Stimuli • Visualization • Word Cycle • Word Sort • Word Wall • Workbook/Work Sheets 	<ul style="list-style-type: none"> • Homework • Independent Reading • Independent Study • Learning Contract • Learning Log/Journal • Memorization • Note Making • Portfolio • Reading Response • Reflection • Report • Response Journal 	<ul style="list-style-type: none"> • Communication Applications • Computer-Assisted Instruction • Database Applications • Email Applications • Graphic Applications • Internet Technologies • Media Presentation • Media Production • Multimedia Applications • On-line Public Access Catalogues • Spreadsheet Applications • Time-Management Applications
Inquiry Research Mode		
<ul style="list-style-type: none"> • Cognitive Skills Model • Decision-Making Models • Historical/ Geographic Inquiry • Inquiry Process • Mathematical Problem Solving • Problem-Based Models • Questioning Process • Research Process • Scientific Method • Technical Design Process • Writing Process 		

Thinking Skills Strategies

<ul style="list-style-type: none"> • Analyzing Bias/Stereotype • Anticipation Guide • Brainstorming • Case Study • Classifying • Concept Clarification • Concept Mapping • Estimating • Experimenting • Expressing Another Point of View • Fair Test • Graphing • IDEAL Problem Solving • Issue-Based Analysis • Lateral Thinking • Manipulatives • Map Making 	<ul style="list-style-type: none"> • Media Analysis • Mental Calculation • Metacognitive Reflection • Mind Map • Model Making • Oral Explanation • Problem Posing • Problem Solving • Process Notes • Semantic Feature Analysis • Seriation • Statistical Analysis • Think Aloud • Visual/Graphic Organizers • Writing to Learn
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STRATEGIES FOR ASSESSMENT AND EVALUATION OF STUDENT PERFORMANCE:

There are three forms of assessment that will be used throughout this course.

Assessment for learning: Will occur before the introduction of a new concept to determine student readiness and to obtain information about student interests and student preferences.

Assessment as learning: Will occur frequently and in an ongoing manner during instruction, to enable students to monitor their own progress towards achieving their learning goals (self – assessment).

Assessment of learning: Will occur at or near the end of a period of learning, this summary is used to make judgments about the quality of student learning using established criteria, to assign a value to represent that quality and to communicate information about achievement to students and parents.

Evidence of student achievement for evaluation is collected over time from three different sources – *observations, conversations, and student products*. Using multiple sources of evidence increases the reliability and validity of the evaluation of student learning.

Assessment as Learning	Assessment for Learning	Assessment of Learning
Student Product <ul style="list-style-type: none"> • Journals/Letters/Emails(checklist) • Learning Logs (anecdotal) • Entrance tickets • Exit tickets 	Student Product <ul style="list-style-type: none"> • Assignment • Journals/Letters/Emails (checklist) • Pre-tests (scale/rubric) • Quizzes (scale/rubric) • Rough drafts (rubric) • Portfolios (rubric) • Posters (rubric/scale) • Peer feedback (anecdotal/checklist) 	Student Product <ul style="list-style-type: none"> • Assignment • Journals/Letters/Emails (checklist) • Tests (scale/rubric) • Exam • Rough drafts (rubric) • Portfolio (rubric) • Posters (rubric/scale)

	<ul style="list-style-type: none"> • Reports (rubric) • Essays (rubric) • Webbing/Mapping (rubric/scale) • Entrance ticket • Vocabulary notebooks (anecdotal) • Visual Thinking Networks (rubric) 	<ul style="list-style-type: none"> • Reports (rubric) • Essays (rubric) • Visual Thinking Networks
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Observation	Observation	Observation
<ul style="list-style-type: none"> • Whole class discussions (anecdotal) • Self-proofreading (checklist) 	<ul style="list-style-type: none"> • Class discussions (anecdotal) • Debate (rubric) • PowerPoint presentations (rubric) • Performance tasks (anecdotal/scale) 	<ul style="list-style-type: none"> • Debate (rubric) • PowerPoint presentations(rubric) • Performance tasks (anecdotal/scale)

Conversation	Conversation	Conversation
<ul style="list-style-type: none"> • Student teacher conferences • Small Group Discussions (checklist) • Pair work (checklist) • Debate 	<ul style="list-style-type: none"> • Student teacher conferences • Small group discussions(checklist) • Pair work (anecdotal) • Peer-feedback (anecdotal) • Peer-editing (anecdotal) • Oral pre-tests (scale/rubric) • Oral quizzes (scale/rubric) 	<ul style="list-style-type: none"> • Student teacher conferences • Questions and Answer Session (checklist) • Oral Tests

THE FINAL GRADE

Percentage of Final Mark	Categories of Mark Breakdown
70%	Assessment of Learning Tasks Throughout the Term
30%	Final Written Examination: 30%

A student's final grade is reflective of their most recent and most consistent level of achievement.

The balance of the weighting of the categories of the achievement chart throughout the course is:

SUBJECT AREA	Knowledge	Inquiry/Thinking	Communication	Application
Science	30	25	20	25

LEARNING SKILLS AND WORK HABITS

In addition to the final grade the report card also shows student achievement of learning skills and work habits throughout the course. These are not included in the calculation of the final grade for this course. The six areas are:

1) Responsibility 2) Organization 3) Independent Work 4) Collaboration 5) Initiative 6) Self-Regulation

They are assessed as:

E (excellent); G (good); S (satisfactory); N (needs improvement)

STUDENTS' RESPONSIBILITIES WITH RESPECT TO EVIDENCE FOR EVALUATION IN GRADE 10 SCIENCE

Cheating and Plagiarism

Blyth Academy commits to having policies for assessments that minimize the risk of cheating. We also commit to begin each course with refresher learning on cheating.

In the event of cheating:

- Student will meet with the teacher, Head of School and possibly parent(s)
- A course of action will be decided based on the meeting

Blyth Academy commits to begin each course with refresher learning on how to properly credit and source work from other sources; therefore, plagiarism at the Grade 11 and 12 levels is not considered accidental.

The following protocol will be followed for true plagiarism:

- Student will meet with the teacher, Head of School, and possibly parent(s)
- The assignment will be re-worked to the teacher's satisfaction for a grade of up to 50%
- If the student repeats the offence, a score of zero will be given with a likely suspension and possible consequence of expulsion from school.
- A third-time offence will result in expulsion

Improper citations or situations in which a teacher deems the student to have acted with good intentions:

- The school will work with the student to ensure plagiarism is understood and will not be repeated
- A second submission of the assignment will be permitted
- The teacher will decide how the re-submission will be evaluated (50% or full value)

Late and Missed Assignments

Any assignment given by a teacher will have a clear ***due date***. It is the expectation that a student will hand in the assignment on, or before, the due date. If there is a problem with getting the assignment in by the due date, the student must discuss this with the teacher prior to the due date. There will be an opportunity to hand in work up to one week after the due date. Late work loses 5% a day to a maximum of 30% after which the assignment will not be accepted or marked without an accompanying doctor's

note.

Missed Tests or Exams

A student who misses an assessment or evaluation, for a legitimate reason, can make up that assessment or evaluation the next day before or after the class. A student cannot write during class time. A missed exam will require a doctor's note certifying the absence.

PROGRAM PLANNING CONSIDERATIONS FOR SCIENCE

The Role of Information and Communication Technology in Grade 10 Science

The use of technology has given students access to additional and powerful resources. Students will use real and virtual microscopes to visualize cells and microscopic organisms in this course. A science blog will also be established to highlight practical uses of biology and real-world examples of how biology enhances our daily lives.

Planning the Grade 10 Science Program for Students with Special Educational Needs

During this course the teacher will take into consideration the wide range of learning styles and needs of the students. Using the Student Support Plans, universal design and differentiated instruction are strategies that the teacher will use to meet these specific needs.

As per the Student Support Plan, accommodations provided may include: extra time, formula sheet, prompts, copies of notes, process sheets and cue cards.

Planning the Grade 10 Science Program for Students with English as a Second Language

There are no English as a Second Language learners in this class.

Promotion of Careers in Science

The knowledge and skills that students acquire in the sciences are useful in preparation for a variety of fields in post-secondary education. References are made throughout the course to applications in research, medicine, engineering, resource management, teaching and science. Students are made aware of these options and are encouraged to investigate areas of interest to them by attending the Ontario University Fair, Study and Go Abroad Fair, Ontario College Fair and university visits to the school. As appropriate, guest speakers will be invited into the class, or the school, to discuss career options related to the sciences. Students also have the opportunity to do a co-op placement in a related field.

Health and Safety in Science

Teachers must model safe practices at all times and communicate safety expectations to students in accordance with school board and Ministry of Education policies and Ministry of Labour regulations. Teachers are responsible for ensuring the safety of students during classroom activities and also for encouraging and motivating students to assume responsibility for their own safety and the safety of others. Teachers must also ensure that students have the knowledge and skills needed for safe participation in science activities.

To carry out their responsibilities with regard to safety, it is important for teachers to have:

- concern for their own safety and that of their students;
- the knowledge necessary to use the materials, equipment, and procedures involved in science safely;
- knowledge concerning the care of living things – plants and animals – that are brought into the classroom;
- the skills needed to perform tasks efficiently and safely.

Students demonstrate that they have the knowledge, skills, and habits of mind required for safe participation in science activities when they:

- maintain a well-organized and uncluttered work space;
- follow established safety procedures;
- identify possible safety concerns;
- suggest and implement appropriate safety procedures;
- carefully follow the instructions and example of the teacher;
- consistently show care and concern for their own safety and that of others.

Various kinds of health and safety issues can arise when learning involves field trips. Out-of-school field trips can provide an exciting and authentic dimension to students' learning experiences. They also take the teacher and students out of the predictable classroom environment and into unfamiliar settings. Teachers must preview and plan these activities carefully to protect students' health and safety.

RESOURCES

ON Science Perspectives 10 - Nelson, 2009