Riverdale Collegiate Institute – Toronto District School Board

Evaluation Policy and Course Outline

Earth and Space Science, Grade 12,

University Preparation (SES4U)

NOTES

1. All Ontario Ministry of Education curriculum documents with full course content information can be located at www.edu.gov.on.ca/eng/curriculum/secondary/

2. Detailed information on Ministry of Education assessment, evaluation, and reporting policy is provided in Ontario Schools, Kindergarten to Grade 12, Policy and Program Requirements (OS), 2011, located at at www.edu.gov.on.ca/eng/document/policy/os/index.html

COURSE DETAILS

Program Area:	Science
Curriculum Leaders:	Ms. Muhammad-Gold; Mr. Dermer (acting)
Course Title:	Earth and Space Science, Grade 12 (SES4U)
Curriculum Document:	Ministry of Education. *The Ontario Curriculum Grades 11 and 12: Science*. Queen's Printer for Ontario, 2008.
Credit Value:	1
Teacher:	Mr. Dunbar, room 110W
Prerequisite:	Science Grade 10, Academic
Textbook:	Borrero *et al.* 2008. Earth Science. Geology, the Environment, and the Universe. Glencoe. New York, NY. Pp. 1028.
Website:	tdsb.elearningontario.ca

OVERALL GOALS

This course develops students' understanding of Earth and its place in the universe. Students will investigate the properties of and forces in the universe and solar system and analyse techniques scientists use to generate knowledge about them. Students will closely examine the materials of Earth, its internal and surficial

processes, and its geological history, and will learn how Earth's systems interact and how they have changed over time. Throughout the course, students will learn how these forces, processes, and materials affect their daily lives. The course draws on biology, chemistry, physics, and mathematics in its consideration of geological and astronomical processes that can be observed directly or inferred from other evidence.

OVERALL EXPECTATIONS

A *Scientific Investigation Skills and Career Exploration*

A1 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);

A2 identify and describe careers and Canadian contributions related to the fields of science under study.

B *Astronomy (Science of the Universe)*

B1 analyse the development of technologies that have contributed to our understanding of the universe, and evaluate the impact of milestones in astronomical theory or knowledge on the scientific community;

B2 investigate and analyse the properties of the universe, particularly the evolution and properties of stars, in both qualitative and quantitative terms;

B3 demonstrate an understanding of the origin and evolution of the universe, the principal characteristics of its components, and techniques used to study those components.

C *Planetary Science (Science of the Solar System)*

C1 analyse political, economic, and environmental issues related to the exploration and study of the solar system, and how technology used in space exploration can be used in other areas of endeavour;

C2 investigate features of and interactions between bodies in the solar system, and the impact of these features and interactions on the existence of life;

C3 demonstrate an understanding of the internal (geological) processes and external (cosmic) influences operating on bodies in the solar system.

D *Recording Earth's Geological History*

D1 analyse, with reference to geological records, the relationship between climate, geology, and life on Earth, and evaluate contributions to our understanding of changes in Earth systems over geological time;

D2 investigate geological evidence of major changes that have occurred during Earth's history, and of the various processes that have contributed to these changes;

D3 demonstrate an understanding of how changes to Earth's surface have been recorded and preserved throughout geological time and how they contribute to our knowledge of Earth's history.

E Earth Materials

E1 analyse technologies used to explore for and extract Earth materials, and assess the economic and environmental impact of the exploitation of such materials;

E2 investigate the properties of minerals and characteristics of rocks, including those in their local area;

E3 demonstrate an understanding of the properties of minerals and the formation and characteristics of rocks.

F Geological Processes

F1 analyse technological developments that have increased our knowledge of geological processes and structures, and how this knowledge assists in monitoring and managing these processes and structures;

F2 investigate, through the use of models and analysis of information gathered from various sources, the nature of internal and surficial Earth processes, and the ways in which these processes can be quantified;

F3 demonstrate an understanding of the processes at work within Earth and on its surface, and the role of these processes in shaping Earth's surface.

ASSIGNMENTS

Evaluations in grade 12 earth and space science will cover all four achievement categories. Regular attendance and completion of all assignments will help you succeed in this course. In addition there will be many smaller assessments throughout the year to provide you with feedback about your progress.

Please note: evaluations are *subject to change*. This list is a sampling of the kinds of activities and assignments you can expect to be evaluated on in this course.

Unit	**Timing**
Scientific Investigation Skills and Career Exploration	Taught and evaluated throughout the course as part of the other units
Astronomy	September ~ October
Planetary Science	November ~ December
Recording Earth's Geological History	January ~ February
Earth Materials	March ~ April
Geological Processes	April ~ May
TBD—Culminating Activity and/or Exam	May ~ June

EVALUATION PLAN

Each student is evaluated according to the four achievement categories: Knowledge & Understanding; Thinking & Investigation; Communication; and Application.

	Knowledge & Understanding	**Thinking & Investigation**	**Communication**	**Application**
Term (70%)	30%	30%	20%	20%
Final Evaluation (30%)	This evaluation is cumulative, containing material from all units and will evaluate all 4 achievement categories.			

Unit	**Assignments**	**Achievement Categories**	**Due Date**
A. Scientific Investigation Skills and Career Exploration	Taught and evaluated throughout the course as part of the other units		
B. Astronomy (Science of the Universe)			
C. Planetary Science (Science of the Solar System)			
D. Recording Earth's Geological History			
E. Earth Materials			
F. Geological Processes			
Culminating Activity			

Note: K = knowledge & understand; I = thinking &investigation; C = communication; A = application

REPORTING

Four reports cards will be issued during the year. All reports will give a numeric grade to each student calculated according to the achievement categories. All reports are cumulative. The November, February and April report cards are

snapshots of all course work until that time. They will be based on the most consistent level of achievement to that point in time.

LEARNING SKILLS

On each report card there are 6 learning skills that are assessed. These learning skills will be assessed, but will not be included when determining the student's grade. These are the four levels of the learning skills:

N (level 1) = needs improvement (student rarely exhibits the skill criteria)
S (level 2) = satisfactory (student sometimes exhibits the skill criteria)
G (level 3) = good (student usually exhibit the skill criteria)
E (level 4) = excellent (student always or almost always exhibits the skill criteria)

LEARNING SKILL	The student…
Responsibility	accepts responsibility for own behaviour uses class time effectively completes and submits class work, homework, and assignments according to timelines fulfills responsibilities and commitments
Organization	brings required material to class keeps an organized and complete notebook is aware of and is prepared for quizzes/tests establishes priorities and manages time to achieve goals
Independent Work	completes class work/homework follows instructions with minimal supervision shows thought and revision pays attention in class and stays on task
Collaboration	does a fair share of work shows respect for all group members (listens actively, encourages others, considerate) shares ideas and resources with peers cooperates to complete task and works to achieve goal
Initiative	tries new techniques and approaches to learning shows interest and curiosity in learning demonstrates the capacity for innovation makes up missed work
Self-regulation	seeks extra help when appropriate assesses and reflects critically on own strengths, needs, and interests perseveres and makes an effort when responding to challenges sets own individual goals and monitors progress towards achieving them

A range of teaching, assessment and evaluation strategies will be used to address the needs of students' learning styles and allow students a variety of methods to demonstrate their achievement of the expectations.

Teaching Strategies

To facilitate the learning of the various concepts, a variety of teaching strategies will be used and might include:

Activity Based Strategies
Examples: practical laboratory work, oral presentations, field trips, simulations, activity centres

Cooperative Learning Strategies
Examples: Think-Pair-Share, Teams-Games-Tournament, Group Investigation

Arts Based Strategies
Examples: drawing and origami

Direct Instruction Strategies
Examples: Socratic dialogue, lecture, demonstration, conferencing, review, tutorial, textbook

Independent Learning Strategies
Examples: homework, independent reading/study, memorization, note making, reports

Inquiry/Research Models
Examples: inquiry process, research process, scientific process, writing process

Technology Applications
Examples: database application, internet websites and research, media presentation

Thinking Skills Strategies
Examples: brainstorming, classifying, concept mapping, concept attainment, concept formation, experimenting, expressing another point of view, graphing, issue-based analysis, lateral thinking, oral explanation, problem solving

Assessment

The primary purpose of assessment is to improve student learning. Assessment is ongoing, varied in nature and allows students to assess their own progress and determine next steps.

The following assessment strategies may be used at different times throughout the course: quizzes; practice tests; conferencing; practical skill checks; written assignments; self-assessment/peer-assessment; and reflective summary.

Evaluation

Evaluation is varied and is used to determine a student's achievement grade. The following evaluation strategies may be used at different times throughout the course: quizzes, tests, written lab reports, practical skill checks, written assignments, presentations, written exams

BIG IDEAS

Astronomy (Science of the Universe)

- The development of more sophisticated technologies has enabled us to achieve a deeper, more thorough understanding of the origin and evolution of the universe.
- Scientific theories about the universe are refined and altered as new evidence is discovered.

Planetary Science (Science of the Solar System)

- Space exploration and the technologies that have been developed to facilitate it have had positive and negative effects on society, the economy, and the environment.
- Space exploration presents many hazards.
- Interactions among bodies within the solar system have an impact on the existence of life.

Recording Earth's Geological History

- Earth is very old, and its atmosphere, hydrosphere, and lithosphere have undergone many changes over time.
- Changing conditions on Earth over time have had positive and negative effects on life on the planet.

Earth Materials

- Exploration for and extraction and refining of materials from below the surface of Earth have positive and negative effects on the economy, society, and the environment.
- Different types of rocks have different origins, properties, characteristics, and uses.

Geological Processes

- Earth's lithosphere is constantly changing as the result of natural phenomena and human activity.
- Specialized technologies have enabled us to increase our knowledge and understanding of Earth's structure and have improved the ability of scientists to monitor and predict changes in the lithosphere.