**Rubrics For The New BC Curriculum**

**Why were the rubrics created?**

1. As a service, support, and resource for teachers!
   1. Many teachers have expressed confusion around how to assess the curricular competencies in connection with the big ideas and content. Although the rubrics appear to be organized by the big ideas, this is because students need a topic to analyze, evaluate, inquire into, etc. The focus is on the competencies, not the content, but we are using the content as a vehicle for developing the competencies.
2. To support the inclusion of diverse learners
   1. The idea that all students will achieve the exact same competency standards is not realistic given the diversity of our learners. We need to understand the scope and sequence of development so that we can assess where students are, set goals for the next stage of their learning, and teach what our students are ready for.
   2. Competency based IEP’s are important, and at the same time, we still want students with disabilities to have access to general curriculum. The intent here is to show the early stages of competency and conceptual development, so we can see where to start with learners who are not yet ready for the complexity others may be ready for.

**How to Use the Rubrics**

1. The rubrics are for the unit. You do not need a rubric for every activity, that will exhaust teachers. You can use the same rubric all term long. One day you are drawing diagrams, another time completing a written activity, and a third you are having a class discussion. Regardless of how the student demonstrates their learning (i.e. visually, in writing, or orally), they can be assessed on the rubric.
2. Use different colors for each week to track student learning. So you might highlight a student in week one of the unit in the emerging column in yellow, then in week three they demonstrate developing level competencies so you use a blue highlighter, and then by the end of the unit they have achieved proficiency which you might highlight in pink. This tracks a student’s learning across the term. In the end, if they achieved proficiency – their mark reflects this level of mastery – i.e. they would get a B, or a percentage in the 73-85 range. We DO NOT average marks – it doesn’t matter where they started, it’s what they achieved that counts!
3. For students on I.E.P.s in the elementary years, IEP goals might say something like “Jennifer will develop emerging level competencies and understandings in Science”. In the high school years, where even the emerging level may be too complex for students with significant intellectual disabilities, the “Access Point” column has been added to support teachers in recognizing the entry points to learning these students may benefit from. In this case, an IEP goal might say something like “Jennifer will achieve access level competencies and understandings in science”, and the mark would then be related to their IEP, not course credit requirements. NOTE: Students with Learning Disabilities should NEVER be modified – they have the same cognitive abilities as their peers – they just need differentiated opportunities to learn and demonstrate their learning. Their goals should be the same as every one else’s – proficiency! The access point is for students with significant intellectual disabilities, not learning disabilities.

***NOTE: These rubrics are copyrighted. They may be used, adjusted, and reproduced, for classroom use freely. They MAY NOT be repackaged, sold, or substantially altered (e.g. to fit other province’s curricula) without written permission from Dr. Jennifer Katz,*** [***Jennifer.Katz@ubc.ca***](mailto:Jennifer.Katz@ubc.ca)

**KINDERGARTEN SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/k>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Plants and animals have observable features | Lists some features of familiar plants and animals | Poses questions, observes and describes features of local plants and animals, explains Indigenous uses of them | Makes connections between features and the ability to meet needs in local plants and animals – relates to place | Compares and contrasts how the features of local plants and animals help them meet their needs |
| Humans interact everyday with matter through familiar materials | Explores the characteristics of familiar materials | Describes the characteristics of familiar materials | Poses questions, measures and experiments to determine properties of familiar materials | Justifies the selection of familiar materials for a given task based on its characteristics |
| The motion of objects depends on their properties | Explores the different motions of objects | Demonstrates, measures, and illustrates the movement of objects using charts or pictographs | Analyzes the relationship between motion and properties of objects (e.g. round things roll) | Designs objects to move in a particular way |
| Daily and seasonal changes affect all living things | Identifies daily and seasonal changes in their local environment | Describes how weather and seasonal changes affect living things (e.g. availability of food, adaptation to cold), illustrates using charts or pictographs | Forms hypotheses, investigates and evaluates the impact of daily and seasonal changes (i.e. what has the greatest impact) on living things – relates to place | Designs a product to help a selected plant or animal to survive in the local environment |
| Indigenous Perspectives | Recognizes that Indigenous people have stories to share about scientific topics (e.g. plants and animals, seasons and weather) | Describes or retells Indigenous stories about scientific topics | Analyzes the value of Indigenous stories about scientific topics | Appreciates the wisdom inherent in Indigenous knowledge and stories about scientific topics |

**GRADE 1 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/1>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Observable patterns and cycles occur in the local sky and landscape. | Identifies weather and seasons | Poses questions, makes observations, describes observable patterns and cycles in weather and landscapes (e.g. snow/winter) | Makes predictions, investigates different perspectives and knowledges (including Indigenous) about why and how living things adapt to weather and seasons | Makes connections between past and present adaptations and their effects on living and non-living things |
| Observes and identifies common objects in the sky | Describes multi-cultural beliefs (including Indigenous) about the cycles of sun, moon, and stars in the sky, their impact on earth (e.g. day/night) | Analyzes multicultural uses and understandings of astrology (including Indigenous) (e.g. navigation, resource use), impact today of the sun | Designs or proposes new technologies using astrology, sunlight, etc. |
| Living things have features and behaviours that help them survive in their environment. | Lists features of living things and nonliving things. | Observes, categorizes, and describes features and behavioural adaptations of living things in the local environment. | Examines, makes connections related to how the features and behaviours of living things help them survive in their local environment | Evaluates, with supporting evidence, the relative importance of different features in responding to environmental stimuli. |
| Light and sound can be produced and their properties can be changed | Identifies sources of light and sound.  Categorizes light and sound by properties (e.g. loud/soft, bright/dull) | Observes, measures, categorizes and demonstrates how light and sound can be produced and their properties changed. | Analyzes ways in which light and sound can be produced both artificially or naturally in terms of scientific innovation (ie why we produce these, how they help us) | Experiments with light and sound to change properties for a specific purpose. |
| Matter is useful because of its properties | Lists basic properties of matter (wet, dry, hard, soft) | Measures and describes basic properties of solids, liquids, and gases and their uses | Makes predictions about properties of matter (e.g. will float), examines uses of local products related to their properties | Selects materials for a given task based on properties |

**GRADE 2 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/2>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Living things have life cycles adapted to their environment | Recognizes that living things grow and change | Describes how different species of animals, including humans, grow in different ways and at different paces, participates in and appreciates related Indigenous storytelling | Observes and differentiates the life cycles of metamorphic and non-metamorphic living things (e.g. human to frog) | Makes inferences about why some living things have life cycles that are metamorphic and some are non-metamorphic |
| Identifies stages of the life cycle | Classifies and describes similarities in children and their parents, observes a pattern across species | Questions, investigates, and explains how and why some animals look like their parents and some don’t, but all follow a similar growth and development pattern | Hypothesizes reasons for differences across species (e.g. why one animals matures faster than another) |
| Identifies ways living things adapt to their environment | Questions, investigates, and describes life cycles of species in a given habitat | Analyzes ways of conserving living things in a given habitat, including Indigenous practices and perspectives | Proposes innovative ways to conserve living things |
| Materials can be changed through physical and chemical processes | Identifies ways a particular object can be changed (e.g. water) | Observes, record, classify, and describes physical and chemical changes | Distinguishes between physical and chemical changes, describes incidences of natural and man made changes | Proposes ways to change a material for a particular purpose |
| Forces influence the motion of an object | Names objects that push or pull | Defines force as something that moves objects | Measures and analyzes the effects of forces on different materials and shapes | Compares the degree of force involved in particular tools, objects, and actions |
| Defines force as something that pushes or pulls | Distinguishes (classifies) gravity, magnetism, and static electricity forces | Examines examples of the existence and use of gravity, magnetism, and static electricity in their environment | Evaluates the influence of gravity, magnetism, and static electricity in their environment, and on themselves |
| Water is essential to all living things, and it cycles through the environment | Recognizes that water is crucial to life on Earth | Understands that all humans, plants, and animals need water to survive | Analyzes how and why water is necessary for human, plant, and animal survival, with consideration of Indigenous values and beliefs about water | Shows critical understanding of the importance of water (ie. can consider the devastating impact of a lack of water for life on Earth) |
| Recognizes that our planet has a water cycle | Appreciates and is able to describe basic components of the Earth’s water cycle (consisting of evaporation, condensation, precipitation, and collection) | Elaborate on the interdependence of the four main stages involved in the Earth’s water cycle, including the cause and effect of each stage | Can consider the criteria involved in differing environments, that affect the water cycle particular to location |
| Recognizes that water is an integral component of human life | Investigates, observes, and develops an understanding of how water is used for everyday living | Can explain why it is important for humans to lessen their consumption of water, with consideration of Indigenous values and beliefs, and can list several ways to reduce water usage | Assesses the consequences of the overconsumption of water |

**GRADE 3 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/3>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Living things are diverse, can be grouped, and interact in their ecosystems | Identifies living and non living things | Categorizes and describes living things based on attributes (e.g. animals and plants) | Creates multiple categorical organizations for living things based on multiple attributes (can re-sort into new groups, sorts into groups based on multiple attributes) – connects to place | Justifies a categorical framework for living things in an ecosystem based on scientific importance (i.e. categorizes in relation to a scientific question or problem) |
| Identifies living and non living things | Identifies linear relationships among living things (e.g. food chain) | Analyzes the interdependence of organisms in a local ecosystem using ethical scientific processes, relates to Indigenous practices and perspectives / worldviews | Proposes solutions to sustainability issues in connection to interdependence |
| All matter is made of particles | Recognizes that everything is made of small pieces called particles | Poses questions about the make-up of objects based on observations of the natural word that can be investigated, explores Indigenous perspectives | Selects strategies for conducting an inquiry to answer questions about matter, collects data and categorizes in drawings and tables | Infers scientific understandings – proposes possible solutions to problems in the natural world |
| Thermal energy can be produced and transferred | Recognizes the sources of thermal energy. | Can explain the different types of thermal energy. | Selects strategies for conducting an inquiry to answer questions, predicts, analyzes evidence related to the transfer of thermal energy | Analyzes how energy is produced and transferred between objects through the design of an experiment. |
| Wind, water, and ice change the shape of the land | Recognizes that land can change | Describes the processes of erosion and deposition, appreciates Indigenous knowledges related to stewardship | Analyzes the similarities and differences in how wind, water, and ice can change the shape of the land | Proposes solutions to issues of soil erosion in the local environment |

**GRADE 4 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/4>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| All living things sense and respond to their environment | Recognizes that humans, other animals and plants sense and respond to their environment | Describes how humans, other animals and plants sense and respond to their local environment using a variety of methods and technologies | Predicts, analyzes evidence related to how humans, other animals and plants sense and respond to their environment, creates organizations / categories | Appreciates Indigenous knowledges, synthesizes and compares to their own experience in their local environment and sense of place |
| Matter has mass, takes up space, and can change phase | Identifies and categorizes phases of matter | Describes changes in phases of matter using a variety of methods and technologies | Analyzes the role of temperature and other catalysts related to phase changes in matter | Makes connections between phase changes and environmental issues, proposes solutions |
| Energy can be transformed | Identifies familiar types of energy | Describes methods of energy transformation using a variety of methods and technologies, categorizes them | Differentiates ways in which energy is transformed naturally and using technologies, including by Indigenous peoples | Designs technologies to transform energy to solve problems in the local community and beyond |
| The motion of the earth and the moon cause observable patterns that affect living and nonliving systems | Identifies impacts of weather and seasons on living and non living things | Describes observable patterns and cycles that connect earth’s rotation and conditions on earth using a variety of methods and technologies | Investigates different perspectives and knowledges (including Indigenous) about why and how earth’s rotation impacts living and non-living systems | Designs technologies to enhance or mitigate the effects of earth’s rotation on living and non-living systems |
| Scientific Processes: Questioning, Predicting, | Makes observations in familiar contexts. | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Connects questions and predictions to other learning, experience of place |
| Scientific Processes: Planning & Conducting | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations, collect data, and represent findings | Independently or collaboratively designs investigations, analyzes evidence, reflects on processes, suggests revisions | Considers ethics, social implications of scientific investigations and innovations |
|  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 5 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/5>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Multicellular organisms have organ systems that enable them to survive and interact within their environment | Identify major organ systems in a multicellular organism | Describes the interrelationship of the various organ systems within a multicellular organism using appropriate forms and technologies | Make connections between organ systems and how multicellular organisms survive and interact within their environment, considers Indigenous knowledges | Evaluates the concept of interconnectedness within a local area, including scientific theories and cultural beliefs (e.g. Indigenous perspectives) |
| Solutions are homogeneous | Understands that solutions are derived from mixing a substance with a solvent | Describes the homogenous properties of a solution and gives examples of solubility | Selects appropriate strategies to solve problems related to properties of solutions and the solubility of solids, liquids, and gases, represents in a variety of ways | Makes connections between properties of solutions and applications in daily life (e.g. food flavouring and ph) |
| Identifies examples of mixing and separating solutions | Explains processes for creating and separating solutions | Evaluates the uses of homogenous solutions, including Indigenous practices and represents using tables, graphs, and technology | Proposes a way to separate or create solutions that are intended to solve current Canadian environmental challenges |
| Machines are devices that transfer force and energy | Identifies the five simple machines | Explains how a complex machine uses a combination of interacting simple machines. | Analyzes how simple machines are connected to create complex machines for specific tasks, including Indigenous designs | Designs simple and complex machines to accomplish a task |
| Recognizes that machines are used to make work easier | Describes simple machines and how they are used to move objects and make work easier (reduce the force needed to complete the task). | Analyzes the advantages and disadvantages of a variety of simple and complex machines for a particular task/ reduction of force and represents using tables, graphs, and technology | Designs simple and complex machines to accomplish a task |
| Earth materials change as they move through the rock cycle and can be used as natural resources. | Recognizes that people depend on the earth’s natural resources for survival. | Explains how the earth materials change as they move through the rock cycle, including Indigenous knowledges | Analyzes ways and times that earths materials related to the rock cycle have been used as natural resources and begins to explain their importance to human survival. | Reflects on their learning about natural resources and the rock cycle and takes action to create change in their class, school or community. |
| Scientific Processes: Questioning, Predicting, | Makes observations in familiar contexts. | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Connects questions and predictions to other learning, experience of place |
| Scientific Processes: Planning & Conducting | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations, collect data, and represent findings | Independently or collaboratively designs investigations, selects data sources, analyzes evidence, reflects on processes, suggests revisions | Considers ethics, social implications of scientific investigations and innovations |
|  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 6 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/6>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment | Identifies major internal systems of multicellular organisms | Evaluates the relative importance of internal systems for the survival of multicellular organisms in differing environments | Analyzes the interdependence of internal systems in multicellular organisms in their local environment | Formulates a hypothesis of effects of malfunctions within an internal system, proposes research or solutions to address health or other local issues |
| Observes personal interactions with their environment related to survival | Describes interactions with the environment, survival and reproduction of multicellular organisms | Analyzes interactions with the environment, survival and reproduction of multicellular organisms in their local environment | Infers relationships (transfers understandings) across organisms and environments, judges similarities and differences |
| Everyday materials are often mixtures | Recognizes that many everyday materials are mixtures | Describes separation techniques, including those used by Indigenous people, for a variety of purposes and relates to place based daily life | Critiques past research to test separation techniques, reflects on processes and evaluates importance related to social or environmental issues | Evaluates ethical choices made related to resource extraction (e.g. Fracking) |
| Newton’s three laws of motion describe the relationship between force and motion | Describes basic forces (push/pull) that influence motion | Describes Newton’s Three Laws of Motion | Analyzes patterns in data exploring physical activity, critiques secondary sources and draws conclusions related to Newton’s laws | Makes connections between Newton’s laws and phenomena in their local environment and physical activity |
| The solar system is part of the Milky Way, which is one of billions of galaxies | Identifies elements of the solar system (planets, stars, etc.) | Describes characteristics of elements of the solar system | Analyzes knowledges, including western and Indigenous, related to the solar system and milky way | Critiques “truth” in scientific knowledges, reflects on ethnocentric perspectives |
| Identifies methods of space exploration | Describes Canadian contributions, including Indigenous knowledge, to exploration and understandings of space | Evaluates the importance of space exploration | Evaluates ethical choices related to space exploration |
| Scientific Processes: Questioning, Predicting, | Makes observations in familiar contexts. | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Connects questions and predictions to other learning, experience of place |
| Planning & Conducting | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations, collect data, and represent findings | Independently or collaboratively designs investigations, analyzes evidence and compares to predictions, reflects on processes, suggests revisions | Considers ethics, social implications of scientific investigations and innovations |
|  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 7 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/7>

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| **Big Idea** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Evolution by natural selection provides an explanation for the diversity and survival of living things | Recognizes that living things adapt to their environment | Describes the connection between adaptation, reproduction, and natural selection | Analyzes patterns in data related to how evolution by natural selection provides an explanation for the diversity of living things, relates to local environment | Predicts future adaptations of local plants and animals based on changing climate and landscapes |
| Recognizes that living things survive or die based on their characteristics | Explains how certain characteristics help or hinder living things, explores Indigenous knowledges of adaptation and natural selection | Makes connections between adaptations in other species and human innovations, connects to multiple ways of knowing | Infers the future fate of specific living things, with regard to environmental issues |
| Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined | Defines elements and compounds | Explores patterns in data to categorize elements and compounds according to chemical structure and/or properties | Compares reactions of elements and compounds in the process of chemical change, and Indigenous uses of chemical change processes (e.g. preserving meat) using a range of methods of presentation | Proposes new methods or products related to chemical change |
| The electromagnetic force produces both electricity and magnetism | Recognizes electricity as a power source | Defines electromagnetism, identifies ways electricity is produced | Analyzes the relationship between magnetism and electricity and evaluates the impacts on the natural world of energy production | Proposes ways to utilize magnetism and electricity in environmentally friendly ways |
| Earth and its climate have changed over geological time | Recognizes that Earth and its climate have changed over geological time | Explores patterns in data to determine examples of changes to Earth and its climate over geological time, referring to multiple ways of knowing | Analyzes how and why Earth and its climate have changed over geological time and connects to Indigenous worldviews regarding sustainability using a range of methods of presentation | Evaluates how Earth and its climate may change in the future |
| Scientific Processes: Questioning, Predicting, | Makes observations in familiar contexts. | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Connects questions and predictions to other learning, experience of place |
| Scientific Processes:  Planning & Conducting | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations, collect data, and represent findings | Independently or collaboratively designs investigations, analyzes evidence, reflects on processes, suggests revisions | Considers ethics, social implications of scientific investigations and innovations |
|  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 8 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/8>

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| **Big Idea** | | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Life processes are performed at the cellular level | | Distinguishes between living and non-living things | Recognizes that all living things are made of cells | Explains cell theory in relation to the complexity of living organisms | Analyzes arguments related to cell theory and viruses and communicates effectively using scientific language, conventions, and representations | Proposes future implications of arguments related to cell theory and communicates effectively using scientific language, conventions, and representations |
| Understands that all living things are made of small units called cells | State the cell theory and use it to sort living and nonliving things in the local environment. | Identify eukaryotes and prokaryotes  Model photosynthesis and cellular respiration in organisms in the local environment | Analyzes patterns in data and connects to secondary sources related to how organelles’ functions contribute to life processes. | Relate microorganisms (e.g. bacteria) to humans (good and bad interactions and interventions) |
| The behaviour of matter can be explained by the kinetic molecular theory and atomic theory | | Identifies the three states of matter | Describes basic movement patterns across the three states  Reproduces the basic structure of an atom | Describes bonding forces within an atom (nuclear vs. electromagnetic) | Critically analyzes how the behavior of matter may be explained by kinetic molecular theory and atomic theory | Connect atomic theory to macroscopic world (environment, industry, lifestyle) |
| Conducts experiment collaboratively with others, and records findings in a variety of ways | Defines dependent and independent variables, and identifies them in experiments | Explains the importance of both types of data for scientific discovery and understanding of our natural world  Critically analyzes data, and the methods used to gather it, for reliability and validity | Defends a stance related to scientific validity of an environmental issue, considers multiple knowledges, suggests a course of action | Proposes an innovative solution to an environmental issue, communicates in creative and powerful ways |
| Energy can be transferred as both a particle and a wave | | Identifies types and sources of energy | Recognize that light is a type of energy and that it can be transferred | Identify the different types of electromagnetic energy found on the electromagnetic spectrum | Differentiates between particle and wave transfer, connects to local environment | Can apply electromagnetic energy to everyday life, industrial operations, medical institutions, etc. |
| The theory of plate tectonics is the unifying theory that explains earths geological processes | | Can recognize geological processes and formations (earthquakes, volcanoes, mountains) | Can identify the layers of the earth and recalls the different observable effects of plate tectonics | Demonstrates how different plate boundaries form and move, Makes connections between plate boundaries and geological formations | Evaluates evidence from secondary sources, including Indigenous knowledges related to the processes of creation of landforms | Hypothesizes social, ethical, and environmental implications of plate tectonics from their own and others’ investigations and discusses their implications to different cultures (e.g. Indigenous). |
| Scientific Processes: Questioning, & Predicting, | Makes observations in familiar contexts. | | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Formulates multiple hypotheses, uses “if…then thinking to make multiple possible predictions | Connects questions and predictions to other learning, experience of place |
| Scientific Processes:  Planning & Conducting | Follows a template or instructions to observe | | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations safely, collects quantitative and qualitative data, and represents findings | Independently or collaboratively designs a range of investigations, collects data accurately and with precision, analyzes evidence, reflects on processes and quality of data, suggests revisions | Considers ethics, social implications of scientific investigations and innovations |
|  |  | | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 9 SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/9>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** | |
| Cells are derived from cells | Identifies cells as the primary unit of multi-cellular organisms | Defines cell theory | Describes basic processes involved in meiosis and mitosis, represents in a variety of ways | Assesses how the process of human reproduction has created diversity, considers multiple knowledges, uses appropriate terminology. | Consider social, ethical, and environmental implications of potential abuses of this scientific field (e.g. cloning, GMO) | |
| The electronic arrangement of atoms impacts their chemical nature | Sorts materials by categories and attributes (e.g. metals, non-metals) | Recognize the common types of electron arrangements found in the world (e.g. ionic and covalent) | Models different arrangements of electrons to determine the compounds formed by elements. | Evaluates patterns represented in the periodic table | Constructs models of electrons to create elements. | |
| Electric current is the flow of electric charge | Illustrates the flow of an electric current and describes safety issues related to electricity | Observes how energy flows through electric currents | Explains how energy flows through electric currents | Connects knowledge of Ohms law to solving problems related to the natural environment or social issues, considers cause and effect | Proposes inventions or creative theories based on how energy flows through electric currents. | |
| The biosphere, geosphere, hydrosphere, and atmosphere are interconnected as matter cycles and energy flows through then | Define the  difference between  biotic and abiotic  components | Identifies that the earth and space are separated by specific layers | Describes how biotic  and abiotic matter and energy cycles within and among each sphere, considers multiple knowledges, represents in a variety of ways | Critically analyzes how humans impact the matter and energy cycles within biotic and abiotic components of ecosystems. | Formulates a physical or mental theoretical model of the natural formation of planetary spheres  Formulates a plan for how humans can reduce their impact on an ecosystem. | |
| Conducts experiment collaboratively with others, and records findings in a variety of ways | Defines qualitative and quantitative data  Interprets graphs and diagrams to observe data patterns and relationships | Explains the importance of both types of data for scientific discovery and understanding of our natural world  Critically analyzes data, and the methods used to gather it, for reliability and validity | Defends a stance related to scientific validity of an environmental issue, suggests a course of action, and communicates it effectively using scientific language, conventions, and representations | Proposes an innovative solution to an environmental issue, communicates in creative and powerful ways | |
| Describe different perspectives related to sustainability | Identifies that other perspectives exist outside of the western platonic knowledge idea | Describes Indigenous and other perspectives related to sustainability | Makes connections between western and Indigenous perspectives, analyzes reasons for differences | Proposes ways of synthesizing beliefs and practices to address an environmental issue | |
| Scientific Processes: Questioning, & Predicting, | Makes observations in familiar contexts. | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Formulates multiple hypotheses, uses “if…then thinking to make multiple possible predictions | Connects questions and predictions to other learning, experience of place | |
| Scientific Processes:  Planning & Conducting | Follows a template or instructions to observe | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations safely, collects quantitative and qualitative data, and represents findings | Independently or collaboratively designs a range of investigations, collects data accurately and with precision, analyzes evidence, reflects on processes and quality of data, suggests revisions | Considers ethics, social implications of scientific investigations and innovations | |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 10 SCIENCE**

<https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/curriculum/science/en_science_10_elab.pdf>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| DNA is the basis for the diversity of living things. | Recognizes that humans have diverse characteristics | Recognizes that DNA underlies our physical characteristics | Describes basic structures of DNA | Examines how variation in the genetic code contained in the sequence of base pairs of DNA impacts diversity | Evaluates the ethics of manipulating genes in a variety of situations or for varying purposes |
| Identifies adaptations living things make that help them survive | Defines natural selection as survival of the fittest | Explains differences and relationship between natural selection and mutation | Analyzes the interactions between natural selection, mutation, and artificial selection and their impacts on diversity | Justifies a POV related to artificial selection |
| Recognizes that people have diverse characteristics that are passed down from their parents | Recognizes that genes are passed down from parent to offspring | Explains the process for genetic transmission | Differentiates when and how many traits of an organism are inherited from its biological parents. | Proposes possible solutions to potential genetic impacts of disease, trauma, or other social construct |
| Energy change is required as atoms rearrange in chemical processes | Sorts materials into metals and non-metals | Recognizes the different groups of the periodic table | Describes the physical and chemical characteristics groups based on their periodicity | Compares electron arrangement of elements to infer position on periodic table and determine characteristics | Assembles an explanation as to how the anatomy of individual elements produce observed characteristics related to their position in the periodic table. |
| Identifies atoms as pieces that make up all matter | Recognizes that the arrangement of electrons determines the compounds formed by elements (ionic vs covalent) | Explains how atom movement results in different types of chemical reactions | Analyzes the movement of atom during chemical reactions to infer reaction type | Interprets patterns that describe how and why atoms rearrange in predictable ways |
| Understands that atoms join together to make larger objects | Recognizes how elements, compounds, and reactions can be represented as models (bohr diagrams/Lewis dot diagrams), words, or formulas | Identify types of bonds (ionic vs. covalent), and chemical reactions based on models | Compares balanced and unbalanced equations and applies understanding of law of conservation of mass | Synthesises appropriate models of chemical reactions and energy change based on given information. |
| Energy is conserved, and its transformation can affect living things and the environment | Understands that things change but the pieces are still there (conservation) | Identifies ways in which energy is transformed | Applies knowledge of conservation of energy to draw conclusions from experiments related to the transformation of energy | Analyzes how energy transformation impacts living things and the environment | Debates the ethics of controversial uses of energy and its transformation (e.g. nuclear) |
| The formation of the universe can be explained by the Big Bang theory | Identifies elements of the universe (planets, stars, etc.) | Able to describe the basics of what the big bang theory is/ what happened | Breakdown the events of the big bang theory showing an understanding of the events that took pace. | Consider the role of scientists in innovation | Analyze and compare the big bang theory against other theories. Theorize and justify about what the “truth” is for the world/ universe creation |
| Describe the big bang theory in simple terms | Identify that the big bang theory isn’t the only theory for the origin of the universe, (being able to identify another theory). | Describes the different worldviews on the origin of the universe, considering some of the things that impact and affect the different theories globally | Express and reflect on a variety of experiences, perspectives, and worldviews through place related to our place in the universe | Infer influences on personal understandings of theuniverse theories. |
| Scientific Processes: Questioning, & Predicting, | Makes observations in familiar contexts. | Makes observations in familiar or unfamiliar contexts and identifies questions to answer or problems to solve. | Demonstrates sustained curiosity about a scientific topic, makes observations, identify questions for inquiry, make predictions about the findings of their inquiry | Formulates multiple hypotheses, uses “if…then thinking to make multiple possible predictions | Connects questions and predictions to other learning, experience of place |
| Scientific Processes:  Planning & Conducting | Follows a template or instructions to observe | Follows a template or instructions to observe, conduct investigations | Follows a template or instructions to observe, conduct investigations safely, collects quantitative and qualitative data, and represents findings | Independently or collaboratively designs a range of investigations, collects data accurately and with precision, analyzes evidence, reflects on processes and quality of data, suggests revisions | Considers ethics, social implications of scientific investigations and innovations |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 11 PHYSICS**

<https://curriculum.gov.bc.ca/curriculum/science/11/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| An object’s **motion** can be predicted, analyzed, and described. | Understands that an object can be at rest or in motion. | Understands the difference between scalar and vector quantities. | Interprets graphs to determine the position, velocity, and acceleration of an object. | Analyzes the relationships among position, velocity, acceleration, and time for an object that is accelerating at a constant rate. | Derives equations to help describe the motion of an object travelling at a constant acceleration in two dimensions. |
| **Forces** influence the motion of an object. | Identifies various forces in nature. Defines mass. | Defines net force as the sum of all forces acting on an object. Compares and contrasts mass and weight. | Represents all forces on an object using free-body diagrams. Determines the net force on an object mathematically. | Solves problems where friction and balanced/unbalanced forces influences the motion of an object on a level surface and on an incline plane. | Designs an experiment to investigate the forces acting on an object or two objects on a level surface and on an incline plane. |
| **Energy** is found in different forms, is conserved, and has the ability to do work. | Recognizes that energy is conserved. | Categorizes energy in its various forms (including kinetic, potential, and thermal). Understands that a system consists of an object or a collection of objects. | Describes work as a transfer of energy in a closed system. | Solves problems where the application of an external force over a distance causes a transfer of energy with a system. | Designs an experiment to demonstrate the conservation of energy within a system using springs, pendulums, or the interaction of objects on a level surface or incline plane. |
| Recognizes that electrons flow through a circuit. | Categorizes the various components of series and parallel circuits. | Draws and constructs series, parallel and complex circuits. | Calculates the resistance, current, voltage, and power for series, parallel, and combined networks. | Analyzes and designs the most appropriate circuit for a given task. |
| Mechanical **waves** transfer energy but not matter | Identifies types of waves. | Defines waves as a transfer of energy. | Describes and gives examples of types of linear waves (one dimension) and circular waves (two dimensions). | Analyzes and illustrates the reflection and refraction of waves travelling in one dimension. Demonstrates the constructive and destructive interference patterns from the interaction of two waves. | Investigates the historical development of a significant application of communications technology that uses waves and assesses its impact on animals and the environment. |
| Recognizes that sound and light are types of waves. | Compares and contrasts transverse and longitudinal waves. | Explains how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments. | Experiments to analyze the principle of resonance and identify the conditions required for resonance to occur | Describes the diverse applications of sound waves in medical devices and evaluates the contribution to our health and safety of sound wave-based technologies. |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 12 PHYSICS**

<https://curriculum.gov.bc.ca/curriculum/science/12/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Measurement of motion depends on our frame of reference. | Defines a reference frame | Describes different reference frames. | Describes the motion of an object in a stationary reference frame. | Analyzes the motion of an object in stationary and moving reference frames quantitatively and qualitatively. | Investigates the impacts of relatively on changes in time, length, and mass. |
| Forces can cause linear and circular motion. | Understands the difference between linear motion and circular motion. | Describes the motion of an object moving in a circle with a constant speed. Describes the relationship between period and frequency. | Analyzes why an object moving at constant speed in a circle is accelerating toward the centre of the circle. | Investigates to determine the effects of horizontal and vertical circular motion on apparent weight. | Designs/analyzes the effects and limitations of amusement park rides. |
| Recognizes that objects orbit in circles/ellipses in gravitational fields. | Explores planetary motion using Kepler’s three laws. | Solves problems for the escape velocity of a spacecraft and analyzes the factors involved in the re-entry of an object into Earth’s atmosphere. | Uses the Law of Universal Gravitation and circular motion to calculate the characteristics of the motion of a satellite. | Investigates the technological challenges of exploring deep space. |
| Forces and energy interactions occur within fields. | Defines a vector field as a region where an object experiences a force. | Compares and contrasts gravitational, magnetic, and electric fields and represents the strength of the field using field lines. | Uses hand rules to describe the directional relationships between electric and magnetic fields and moving charges. | Experiments to determine the function of an electromagnet. Investigates problems for the motion of objects between parallel plates. | Investigates various technologies that use electric and magnetic fields and their impact in medicine and on the environment. |
| Recognizes that an object moving through a field experiences a force. | Defines voltage and magnetic flux. | Experiments to determine how a change in magnetic flux can induce a current and therefore a voltage (Faraday’s Law). | Analyzes the operation of an AC generator and a transformer. Experiments to determine the applications of Lenz’s Law. | Assesses the generation, transmission, and distribution of electricity and investigates their impacts on the environment. |
| Momentum is conserved within a closed and isolated system. | Recognizes that momentum is conserved. | Defines momentum and impulse. | Calculates the momentum of objects. Differentiates between elastic and inelastic collisions. | Describes and models how a force can change the momentum of an object over time. Demonstrates the conservation of momentum mathematically in one- and two-dimension collisions. | Assesses real-life applications and impacts of momentum, impulse, and collisions. Evaluates safety features in moving objects that help reduce impact. |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 11 CHEMISTRY**

<https://curriculum.gov.bc.ca/curriculum/science/11/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| **Atoms and molecules** are building blocks  of matter. |  |  |  |  |  |
| **Organic chemistry** and its applications have significant implications for human health, society, and the environment. |  |  |  |  |  |
| The **mole** is a quantity used to make atoms and molecules measurable. |  |  |  |  |  |
| Matter and energy are conserved in **chemical reactions**. |  |  |  |  |  |
| **Solubility** within a solution is determined by the nature of the solute and the solvent |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 11 EARTH SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/11/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| **Earth materials** are changed as they cycle through the geosphere and are used as resources, with economic and environmental implications. |  |  |  |  |  |
| **Plate tectonic theory** explains the consequences of tectonic plate interactions. |  |  |  |  |  |
| The transfer of energy through the **atmosphere** creates weather, and this transfer is affected by climate change. |  |  |  |  |  |
| The distribution of **water** has a major influence on weather and climate. |  |  |  |  |  |
| Astronomy seeks to explain the origin and interactions of **Earth** **and its solar system**. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 11 ENVIRONMENTAL SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/11/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Complex roles and relationships contribute to **diversity  of ecosystems**. |  |  |  |  |  |
| **Changing ecosystems** are maintained by  natural processes. |  |  |  |  |  |
| Human practices  affect the **sustainability  of ecosystems**. |  |  |  |  |  |
| Humans can play a  role in **stewardship  and restoration**  of ecosystems |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 11 LIFE SCIENCES**

<https://curriculum.gov.bc.ca/curriculum/science/11/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| **Life** is a result of interactions at the molecular and cellular levels. |  |  |  |  |  |
| **Evolution** occurs at the population level. |  |  |  |  |  |
| **Organisms** are grouped based on common characteristics. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 11 SCIENCE FOR CITIZENS**

<https://curriculum.gov.bc.ca/curriculum/science/11/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| **Scientific processes and knowledge** inform our decisions and impact our daily lives. |  |  |  |  |  |
| Scientific knowledge can be used to develop procedures, techniques, and technologies that have implications for **places of employment**. |  |  |  |  |  |
| Scientific understanding enables humans to **respond and adapt to changes** locally and globally. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 12 ANATOMY & PHYSIOLOGY**

<https://curriculum.gov.bc.ca/curriculum/science/12/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| **Homeostasis** is maintained through physiological processes. |  |  |  |  |  |
| **Gene expression**, through protein synthesis, is an interaction between genes and the environment. |  |  |  |  |  |
| **Organ systems** have complex interrelationships to maintain homeostasis. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 12 CHEMISTRY**

<https://curriculum.gov.bc.ca/curriculum/science/12/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Reactants must collide to react, and the reaction rate is dependent on the surrounding conditions. |  |  |  |  |  |
| Dynamic equilibrium can be shifted by changes to the surrounding conditions. |  |  |  |  |  |
| Saturated solutions are systems in equilibrium. |  |  |  |  |  |
| Acid or base strength depends on the degree of ion dissociation. |  |  |  |  |  |
| Oxidation and reduction are complementary processes that involve the gain or loss of electrons. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 12 ENVIRONMENTAL SCIENCE**

<https://curriculum.gov.bc.ca/curriculum/science/12/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Human actions affect the quality of water and its ability to sustain life. |  |  |  |  |  |
| Human activities cause changes in the global climate system. |  |  |  |  |  |
| Sustainable land use is essential to meet the needs of a growing population. |  |  |  |  |  |
| Living sustainably supports the well-being of self, community, and Earth. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |

**GRADE 12 GEOLOGY**

<https://curriculum.gov.bc.ca/curriculum/science/12/courses>

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| **Big Idea** | **Access Point** | **Emerging** | **Developing** | **Proficient** | **Extending** |
| Minerals, rocks, and earth materials form in response to conditions within and on the Earth’s surface and are the foundation of many resource-based industries. |  |  |  |  |  |
| Earth’s geological and biological history is interpreted and inferred from information stored in rock strata and fossil evidence. |  |  |  |  |  |
| The plate tectonic theory explains the changes that occur within Earth and to Earth’s crust throughout geological time. |  |  |  |  |  |
| The form, arrangement, and structure of rocks are affected by three-dimensional forces over time. |  |  |  |  |  |
| Weathering and erosion processes continually reshape landscapes through the interaction of the geosphere with the hydrosphere and atmosphere. |  |  |  |  |  |
|  |  | C-: 50-59 | C+: 67-72  C: 60-66 | B: 73-85 | A: 86-100 |