**Grade - Kindergarten**

**Kindergarten Big Idea - Plants and animals have observable features**.

**Elaborations/Resources:**

* How do the different features of plants and animals help them meet their basic needs?
* Daily outdoor walks with observations, hypothesises about natural phenomena, journaling, and follow up investigation.
* Include study of habitat — food, water, shelter, and space.
* Adaptations:may include structural features (teeth, claws, beaks, camouflage) or behaviours (hibernation, migration, roosting, bird calls, that allow organisms to survive
  + **plants:** features may include roots, stems, leaves, flowers,
  + **animals:** features may include shape, size, feet, teeth, body covering, eyes, ears
* Project Wild <https://hctfeducation.ca/lessons/teacher-tips-and-tricks/>

**Kindergarten Big Idea - Humans interact with matter every day through familiar materials.**

**Elaborations/Resources:**

* What is matter? Familiar materials such as fabric, wood, plastic, glass, metal/foil, sand, etc.
* What are the properties of matter? What qualities do different forms of matter have? How do you interact with matter?
* Use Connecticut State Department of Education’s Grade One – The World of Matter for such activities as the Mystery Box where students use their sense of feel, smell, and hearing to gather evidence to make a deduction about what example of matter is in the box. This unit covers the meaning of matter, the composition of matter, and the way in which matter reacts to changes in temperature while modeling the skills of a scientist conducting a study of the world around them. <http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/gifted_and_talented/theworldofmatter.pdf>

**Kindergarten Big Idea - The motion of objects depends on their properties.**

**Elaborations/Resources:**

* How can you make objects move? Push and Pull
* How does the shape or size of an object affect the object’s movement?
* Use of ramps, toy cars, balls, blocks etc in a play/inquiry setting.
* Units on motions should be available in schools.
* Try Washington State University’s Kindergarten Force and Motion <https://eucaps.wsu.edu/wp-content/uploads/sites/731/2015/04/Kindergarten-Force-Motion-Lessons.pdf>

**Kindergarten Big Idea - Daily and seasonal changes affect all living things.**

**Elaborations/Resources:**

* What daily and seasonal changes can you see or feel?
* How are plants and animals affected by daily and seasonal changes?
* Use of outdoor observations, daily calendar and inquiry.
* Project Wild <https://hctfeducation.ca/lessons/teacher-tips-and-tricks/>
* Daily outdoor walks with observations, hypothesises about natural phenomena, journaling, and follow up investigation.

**Grade – One**

**Grade One Big Idea - Living things have features and behaviours that help them survive in their environment.**

**Elaborations/Resources:**

* How do local plants and animals depend on their environment?
* How do plants and animals use their features to respond to stimuli in their environments?
* How do plants and animals adapt when their basic needs are not being met?
* Classroom plants.
* Wild BC <https://hctfeducation.ca/lessons/teacher-tips-and-tricks/>
* Project Wild and Project Living Tree <https://hctfeducation.ca/wildbc/>
* Daily outdoor walks with observations, hypothesises about natural phenomena, journaling, and follow up investigation.

**Grade One Big Idea - Matter is useful because of its properties.**

**Elaborations/Resources**:

* What makes the properties of matter useful?
* Solids keep shape; liquids and gases flow
* Grade two unit on matter.
* Use Connecticut State Department of Education’s Grade One – The World of Matter which overs the meaning of matter, the composition of matter, and the way in which matter reacts to changes in temperature while modeling the skills of a scientist conducting a study of the world around them. <http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/gifted_and_talented/theworldofmatter.pdf>

**Grade One Big Idea - Light and sound can be produced and their properties can be changed.**

**Elaborations/Resources:**

* Sources of light and sources of sound.
* Properties of light and sound.
* Music instruments. Making instruments. How sound changes.
* Grade four Scholastic Unit on Light and Sound includes suggestions for hands on exploration and kits have light sources, tuning forks etc.
* Resources recommended by SD38 <http://blogs.sd38.bc.ca/sd38mathandscience/wp-content/uploads/sites/14/2015/12/Grade-1-Light-and-Sound-Resources.pdf>

**Grade One Big Idea - Observable patterns and cycles occur in the local sky and landscape.**

**Elaborations/Resources:**

* How do patterns and cycles in the sky and landscape affect living things? sunrise/set, moonrise/set
* The sun and the moon are important in different cultures, with respect to customs and traditions.
* Observe changes in landscape around the school through the seasons and from morning to afternoon.
* Daily outdoor walks, observations, hypothesises about natural phenomena, journaling, and investigation.
* Study knowledge of First Peoples about objects in the sky, plants and animals and the use of seasonal rounds. Use the book The 13 Moons of the Wsanec produced in Saanich. <http://www.racerocks.com/racerock/firstnations/13moons/13moons.htm>
* School units on space often include moon and sun models and units on the seasons can be tried. Suggestions from SD71. <https://portal.sd71.bc.ca/group/wyhzgr4/earthspace/Grade1/Pages/default.aspx>

**Grade - Two**

**Grade Two Big Idea - Living things have features and behaviours that help them survive in their environment.**

**Elaborations/Resources:**

* Why are life cycles important?
* How are the life cycles of local plants and animals similar and different?
* How do offspring compare to their parents? **Offspring and parent:**
  + Non-Metamorphic - A kitten looks like cat and a puppy looks like dog but they do change as they grow; salmon change a great deal as they grow and need fresh and salt water environments to survive.
  + Metamorphic Caterpillars look different from the adult butterfly.
* Local Life cycle studies –
  + Salmonids in the classroom program provided by the DFO, <http://www.pac.dfo-mpo.gc.ca/education/documents/sicprimary-secprimaire/english/sic_primary_all.pdf>
  + caterpillar to butterfly program, mealworm transformation, tadpoles to frogs, wild flowers, Garry Oaks.
* Grade three unit on life cycles.
* Wild BC <https://hctfeducation.ca/lessons/teacher-tips-and-tricks/>
* Project Wild <https://hctfeducation.ca/wildbc/>
* Daily outdoor walks with observations, hypothesises about natural phenomena, journaling, and follow up investigation.

**Grade Two Big Idea- - Materials can be changed through physical and chemical processes**

**Elaborations/Resources:**

* Why would we want to change the physical properties of an object?
* What are some natural processes that involve chemical and physical changes? Physical ways of changing materials include: warming, cooling, cutting, bending, stirring, and mixing.
* Use Connecticut State Department of Education’s Grade One – The World of Matter which overs the meaning of matter, the composition of matter, and the way in which matter reacts to changes in temperature while modeling the skills of a scientist conducting a study of the world around them. <http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/gifted_and_talented/theworldofmatter.pdf>
* Integrate with study of water and examine the freezing and boiling of water.

**Grade Two Big Idea - Forces influence the motion of an object.**

**Elaborations/Resources:**

* What are different ways that objects can be moved?
  + Contact forces: friction (the force exerted by a surface on an object that eventually makes a rolling ball stop), tension (force that is transmitted through a rope when two students pull on opposite ends), normal (the force a desk exerts to hold up the book resting on it), air resistance (friction applied by air on objects moving through it that contributes to the slowing of a paper airplane), applied force (pushing a chair), spring force (force exerted by a stretched or compressed spring).
  + At-a-distance forces:gravitational (the force of the earth t directed down towards the centre of the earth - makes the apple fall to the ground), electrostatic (the force exerted from the attraction and repulsion of charges - makes balloons stick), magnetic (the force exerted by ferromagnetic materials like iron to attract or repel), different types of magnets.
* Grade one unit on magnets.
* Try Kindergarten Force and Motion <https://eucaps.wsu.edu/wp-content/uploads/sites/731/2015/04/Kindergarten-Force-Motion-Lessons.pdf>

**Grade Two Big Idea - Water is essential to all living things, and it cycles through the environment.**

**Elaborations/Resources:**

* Why is water important? How can you conserve water in your home and school? How does water cycle through the environment?
* Water sourcesincluding local watersheds, oceans, lakes, rivers, wells, and springs**.**
* The majority of fresh water is stored underground and in glaciers. (See Project Wild and Project Wet)
* Water conservation**:** fresh water is a limited resource and is not being replaced at the same rate as it is being used.
* Use the CRD’s Every Drop Counts program <https://www.crd.bc.ca/education/school-programs/for-k12-teachers/educator-guides-resources/drinking-water/every-drop-counts>
* Water cycle: The water cycle is driven by the sun and includes evaporation, condensation, precipitation, and runoff. The water cycle is also a major component of weather.
* Connection to other systems:cultural significance of water (i.e., water is essential for all interconnected forms of life).
* Use of water models and tables for water experimentation and play. See <http://www.southernearlychildhood.org/upload/pdf/Science_Concepts_Young_Children_Learn_Through_Water_Play_Carol_M_Gross.pdf>
* Scholastic grade four weather on water changes land.
* Daily outdoor walks, observations, hypothesises about natural phenomena, journaling, and investigation.

**Grade - Three**

**Grade Three Big Idea**

**Living things are diverse, can be grouped, and interact in their ecosystems.**

**Elaborations/Resources:**

* What is biodiversity?
* Why is biodiversity important in an ecosystem?
* Interconnectedness means that all things are related to and interact with each other in the environment.
* How does local First Peoples knowledge of living things demonstrate interconnectedness?
* Energy is needed for life:
  + producers (plants), consumers (animals), and decomposers (bacteria and fungi) respond to their environment in energy pyramids (flow of energy in the community from the sun)
  + food chains: the flow of food energy from one organism to another (e.g., grass to rabbit to lynx)
  + food webs: interconnecting food chains (e.g., a rabbit may be eaten by a lynx or a wolf)
* Study local ecosystems.
* Grade 4 unit on habitats
* Wild BC <https://hctfeducation.ca/lessons/teacher-tips-and-tricks/>
* Daily outdoor walks with observations, hypothesises about natural phenomena, journaling, and follow up investigation.

**Grade Three Big Idea - All matter is made of particles.**

**Elaborations/Resources:**

* How are matter and energy related?
* Matter is anything that has mass and takes up space.
* Atoms are building blocks of matter.
* Try these resources recommended by SD 71 <https://portal.sd71.bc.ca/group/wyhzgr4/chemistry/grade3/Pages/default.aspx>

**Grade Three Big Idea - Thermal energy can be produced and transferred.**

**Elaborations/Resources:**

* What can be a source of thermal energy?Sources of thermal energy can be produced by chemical reactions (e.g., hand warmers), friction between moving objects, the sun, etc.
* Thermal energy: the energy that comes from the movement of particles within matter.
* Transfer of thermal energy:
  + conduction (touching — e.g., hold an ice cube)
  + convection (current — why do we hang mittens over a heat source?)
  + radiation (through space by a wave — e.g., heat from the sun)
* Thermal energy can be covered by conducting a study of weather.
* Many schools have the scholastic grade four weather kits as well as their own on line weather station.
* Try these resources recommended by SD 38 <http://blogs.sd38.bc.ca/sd38mathandscience/wp-content/uploads/sites/14/2016/01/Grade-3-Heat-Resources.pdf>

**Grade Three Big Idea - Wind, water, and ice change the shape of the land.**

**Elaborations/Resources:**

* How is the shape of the land changed by environmental factors?
* Use water tables and/or outdoor water play.
* Integrate with the study of weather.
* The grade four scholastic weather book has a section on “water changes land.”
* Try these resources from district 71 about erosion. <https://portal.sd71.bc.ca/group/wyhzgr4/earthspace/grade3/Pages/gr3earthstudent.aspx>

**Grade - Four**

**Grade Four Big Idea - All living things sense and respond to their environment.**

**Elaborations/Resources:**

* Study adaptations of local animals (aquatic invertebrates, insects, salmon, caterpillars or birds) that help them sense their environment and respond to the environment to help them survive.
* Examine interdependence within ecosystems through an examination of food chains (connect to energy flow and transfer).
* Study biomes by looking at terrestrial, aquatic and marine biomes (regions grouped by similar conditions). BC biomes include Forest, Grasslands, Wetlands, Alpine Tundra, and Marine. <https://www.scienceworld.ca/resources/activities/what-biome> and Biogeoclimatic zones <http://selkirk.ca/discover/bec/zones/pdf/whatis.pdf> and at

<https://www.sfu.ca/geog/geog351fall07/Group06/index.html>

* Find local examples of biomes in the school yard, Swan Lake, Goldstream Park, and tide pools, to illustrate the concept of a region defined by similar conditions and compare one local biome to another. Find BC Biomes at <http://www.env.gov.bc.ca/bcparks/partnerships/ltem/biomes.html>
* Find CRD Biomes at <https://www.crd.bc.ca/education/our-environment/ecosystems/coastal-marine>
* Daily outdoor walks with observations, hypothesises about natural phenomena, journaling, and follow up investigation.
* Grade four units on ecosystems, food chains, and adaptation and Wild BC. <https://hctfeducation.ca/lessons/teacher-tips-and-tricks/>

**Grade Four Big Idea - Matter has mass, takes up space, and can change phase.**

**Elaborations/Resources:**

* The phases of matter and what causes matter to change. Solids, liquids, and gases change with cooling and heating.
* Examine the effect of temperature on particle movement.
* Boiling point, melting point, melting chocolate, making ice cream.
* Try these resources recommended by district 71. <https://portal.sd71.bc.ca/group/wyhzgr4/chemistry/grade4/Pages/default.aspx>

**Grade Four Big Idea - Energy can be transformed.**

**Elaborations/Resources:**

* Energy cannot be created or destroyed but can be transformed. EG Thermal energy through the food chain, Wind power, Tide power, Hydro Power.
* Devices that transform energy.
* What is the relationship between energy input, output, and conservation?
* Different types of energy: kinetic, thermal, light, sound, elastic, nuclear, magnetic, gravitational, and electric.
* Grade four light and sound units in schools.
* Batteries and bulbs units.
* Try these resources recommended by district 71. <https://portal.sd71.bc.ca/group/wyhzgr4/physics/grade4/Pages/default.aspx>

**Grade Four Big Idea - The motions of Earth and the moon cause observable patterns that affect living and non-living systems.**

**Elaborations/Resources:**

* Place based -Monthly phases of the moon creating tides.
* Examine effects of spring and neap tides, and
* Integrate with study of biomes, sensing, and adaptations to see how tides effect living organisms.
* Grade three solar system unit.
* Study local First Nations way of knowing and learning about the sun, earth, moon, and tides. Use the book The 13 Moons of the Wsanec produced in Saanich. <http://www.racerocks.com/racerock/firstnations/13moons/13moons.htm>

**Grade - Five**

**Grade Five Big Idea – Multicellular organisms have organ systems that enable them to survive and interact within their environment.**

**Elaborations/Resources:**

* How organ systems react with one another and their environment to meet basic needs.
* Basic structure and function of the digestive, musculo-skeletal, respiratory and circulatory body systems.
* Grade Five units on the human body.
* Try these resources recommended by district 71. <https://portal.sd71.bc.ca/group/wyhzgr4/biology/grade5/Pages/gr5biostudent.aspx>

**Grade Five Big Idea - Solutions are homogeneous.**

**Elaborations/Resources:**

* Solutions and Solubility
  + Properties of solutions like pH, concentrations, etc.
  + Solutions like coffee or juice that can be separated through evaporation, distillation, and crystallization.
  + Solubility of solids, liquids and gases E.G, salt (a solid) honey (a liquid) and carbon dioxide ( a gas) in water make pop.
* Dissolving process of forming a solution such as when making organic environment friendly dish detergent, or measuring pH or dissolved oxygen to determine water quality.
* Looking at dissolved oxygen as a factor in water quality.
* Try these resources recommended by district 71. <https://portal.sd71.bc.ca/group/wyhzgr4/chemistry/grade5/Pages/default.aspx>

**Grade Five Big Idea - Machines are devices that transfer force and energy.**

**Elaborations/Resources:**

* Properties of simple and complex machines and their force effects.
* Human constructed machines and found in nature machines (the musculoskeletal system uses levers to increase force of applied energy) that transfer force and energy.
* What natural machines can you identify in your local environment?
* How do machines transfer force and energy to change direction or multiply force?
* Grade Five resources on simple machines such as this unit created by SD 71. <https://portal.sd71.bc.ca/group/wyhzgr4/physics/grade5/Documents/sd71_web_Physics_g5.pdf>

**Grade Five Big Idea - Earth materials change as they move through the rock cycle and can be used as natural resources.**

**Elaborations/Resources:**

* Earth materials and rock cycles from the Colorado Department of Education. <https://www.cde.state.co.us/standardsandinstruction/sc3-earthmaterialsrockcycles-pdf>
* How do humans interact with natural resources such as earth, rock, clay, sand, boulders, gravel, minerals and plants? (Study forestry and mining as a way of examining how humans interact with natural resources.) This old unit contains many releavant resources. Grade 5 unit on natural resources.
* How is earth a closed system?
* What is the concept of sustainability and how does it apply to our use of resources? http://resources4rethinking.ca
* Interconnectedness**:** everything in the environment is one/connected (e.g., sun, sky, plants and animals) and we have a responsibility to care for them. How can we act as stewards of our environment?