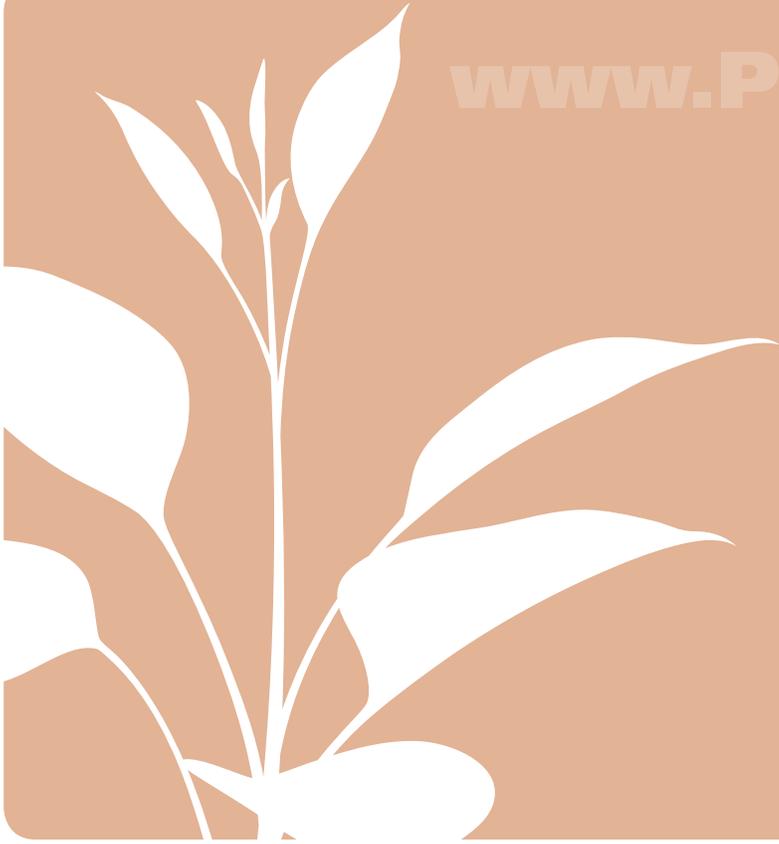


www.PlantWatch.ca



Appendices

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PlantWatch Species

Latin name	Common name	NL	NS	PEI	NB	QC	ON	MB	SK	AB	BC	YK	NWT	NU
<i>Populus tremuloides</i>	Aspen Poplar													
<i>Arctostaphylos uva-ursi</i>	Bearberry													
<i>Galium boreale</i>	Bedstraw, northern													
<i>Betula papyrifera/neoalaskana</i>	Birch, paper													
<i>Houstonia caerulea</i>	Bluets													
<i>Cornus canadensis</i>	Bunchberry													
<i>Ranunculus glaberrimus</i>	Buttercup, sagebrush													
<i>Prunus virginiana</i>	Choke cherry													
<i>Clintonia borealis</i>	Clintonia, blue-bead lily													
<i>Rubus chamaemorus</i>	Cloudberry, bakeapple													
<i>Tussilago farfara</i>	Coltsfoot													
<i>Vaccinium vitis-idaea</i>	Cranberry (partridge berry, lingonberry)													
<i>Taraxacum officinale</i>	Dandelion													
<i>Forsythia suspensa</i>	Forsythia, weeping													
<i>Thermopsis rhombifolia</i>	Golden bean													
<i>Ledum/Rhododendron groenlandicum/decumbens</i>	Labrador Tea													
<i>Syringa vulgaris</i>	Lilac, Common Purple													
<i>Lupinus arcticus</i>	Lupine, arctic													
<i>Acer rubrum</i>	Maple, red													
<i>Epigaea repens</i>	Mayflower													
<i>Pinus contorta</i>	Pine, lodgepole													
<i>Anemone patens</i>	Prairie Crocus													
<i>Clintonia uniflora</i>	Queen's cup													
<i>Rhododendron canadense</i>	Rhodora													

APPENDICES

Latin name	Common name	NL	NS	PEI	NB	QC	ON	MB	SK	AB	BC	YK	NWT	NU
<i>Amelanchier</i>	Saskatoon, serviceberry													
<i>Saxifaga tricuspidata</i>	Saxifrage, prickly													
<i>Saxifraga oppositifolia</i>	Saxifrage, purple													
<i>Maianthemum stellatum</i>	Solomon's seal, star-flowered													
<i>Trientalis borealis</i>	Star-flower													
<i>Fragaria virginiana/vesca</i>	Strawberry, wild													
<i>Myrica gale</i>	Sweetgale													
<i>Larix laricina</i>	Tamarack/Larch													
<i>Trillium grandiflorum</i>	Trillium, white													
<i>Linnaea borealis</i>	Twinflower													
<i>Viola adunca</i>	Violet, early blue													
<i>Nymphaea odorata</i>	Water lily													
<i>Dryas integrifolia/octopetala</i>	White Dryad, Mountain avens													
<i>Elaeagnus commutata</i>	Wolf willow													
<i>Achillea millefolium</i>	Yarrow													

Glossary

Adaptation (to climate change) – Adaptation to climate change is any activity that reduces the negative impacts of climate change and/or takes advantage of new opportunities that may be presented

Alpine – High mountain regions, above the tree line

Alternate – Arrangement of leaves in which successive leaves arise at different levels on opposite sides of the stem (see also: “Opposite”)



Ament – See “Catkin”

Anther – The pollen-producing structures, borne at the tip of a filament in male flower parts (stamens) (See flower diagram on page 87.)

Basal – Located at the base of a plant or plant organ

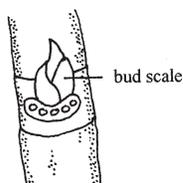
Beaked – Ending in a prolonged tip that resembles a beak

Blade – The whole green leaf, without the petiole or leaf stalk

Boreal Forest – The mainly coniferous or evergreen forest that covers much of Canada’s northern regions

Bract – A small leaf beneath a flower or another plant organ

Bud Scale – A small, modified leaf that covers the bud



Capsule – A dry fruit that releases seed through slits or pores



Carpel – The leaf-like organ of a flower that encloses one or more ovules (see “Pistil”)

Catkin – A highly condensed cluster of (usually) unisexual flowers that lack petals



Circumpolar – A large region around either the North or South Pole; can refer to a plant that is distributed around the globe in northern regions

Clone – A stand or group of plants of one type (all have identical genetic material)

Cluster – A tightly packed group of flowers

Colony – A group of plants that all have the same genetic material

Conifer – Belonging to the order Coniferales, these plants are mostly evergreen with cones and narrow, pointed, often needle-like leaves. Pine, larch, spruce, fir and cedar are all conifers. Larch is the only one which is not evergreen; it sheds its needles annually.

Creeping – Growing along or near the surface of the ground

Cross-pollination – The process by which pollen is carried from the stamens of one plant to the stigmatic surface of another plant (compare with Self-fertilization)

Crown Division – Propagation technique where the base of a plant is divided into sections

Cultivar – A uniform group of cultivated plants obtained by breeding or selection, and propagated as a pure line

Day Neutral – When a plant’s seasonal changes do not depend on how many hours of sunlight the plant receives

- Deciduous** – Falling off at the end of the growing season
- Dormancy** – Lack of plant growth during unfavourable environmental conditions
- Dormant** – For cells, buds, seeds, etc., the period before growth begins
- Ecology** – The science of the interrelationship of organisms and their environment
- Elaiosome** – Oily appendage of a seed (can be an “ant-snack”)
- Ethnobotany** – The study of the relationships between plants and people
- Evergreen** – Plants whose leaves remain green throughout the winter
- Female Tree** – Trees that produce only female flowers (these flowers are imperfect since they have one sex only; pistillate)
- Filament** – The stalk on which anthers are borne; anthers plus filament forms a stamen, the male part of a flower (See flower diagram on page 87.)
- Fire-successional** – Plants that are adapted to the environments present after wildfire
- Floret** – Individual flower in a cluster
- Flower Bud** – Undeveloped flower
- Flower Stem** – The stalk by which a flower is attached to the rest of the plant (also called a peduncle)
- Flowering Sac** – See “Pollen Sac”
- Foliage** – Leaves
- Forb** – A term used in botany to refer to plants – many wildflowers, for example – that do not fit into other classes like trees, shrubs or grasses. Generally, a forb is a broad-leaved, non-woody plant that dies back to the ground at the end of every growing season.
- Fungi** – A group of non-photosynthetic organisms with chitinous walls that feed on organic matter (includes mushrooms)
- Fungal Partners** – Many plants have an important underground relationship with fungi; these organisms are known as fungal partners (symbionts)
- Genetic Mutations** – Changes in the hereditary information carried by an organism
- Genetic Variation** – The genetic differences between individuals of the same species
- Germination** – The first stage in the growth of a seed into a seedling
- Glandular** – A plant organ (e.g. leaf, stem) that possess specialized cells that secrete chemical substances
- Graft(ed)** – The joining of two separate plant parts, like root and stem, or a branch from one plant to a branch from another, so that they can regenerate and grow as one plant
- Growing Degree Summation (GDS)** – A way to measure the warmth to which a plant has been exposed. The GDS is calculated by summing average daily temperatures for a given time period.
- Habitat** – The natural home of an organism
- Hair** – Hair-like structures, also known as trichomes, that are attached to many plant parts
- Hardwood Cuttings** – Cuttings taken from older woody tissues of hardwood trees, used for plant propagation. Cuttings are usually taken in the winter from dormant plant parts (see “Dormant”).
- Hardy** – Plants adapted to cold or otherwise adverse conditions
- Heat Unit** – Temperature affects the rate of plant growth. The amount of accumulated temperature a plant has been exposed to in spring time can be measured in heat units. It is measured through growing degree summation.
- Hermaphroditic** – Plants that have flowers with male and female parts (see “Perfect Flowers”)
- Horticulture** – The science of garden cultivation
- Hybrid Vigour** – The condition of a hybrid that is fitter than either of its parents
- Hybridize** – The process by which two plants with different genetic material produce offspring
- Hydratode** – Pore in the surface of a leaf through which minerals are extruded

Indicator Plant – In phenology studies, a plant useful as a “biological measuring stick,” i.e. its growth occurs in response to a combination of weather and environmental factors, and certain growth phases are easily defined and recognized

ITEX – International Tundra Experiment

Julian Calendar – Calendar that marks the days from January 1st onwards; i.e. January 30 = day 30 and February 28 = day 59

Leaf Pore – Small opening on the leaf surface

Lenticel – Small dot or spot on the bark of a young twig that allows gas exchange between the stem and the atmosphere

Life Cycle -The entire sequence of phases in the growth and development of any organism from birth to reproduction, maturity and death

Loam – Soil that has about equal proportions of sand, silt and clay

Male Tree – Trees that bear only male flowers

Matted – Plants that grow in a very dense and flat cluster, or mat

Microclimate – The climate of a small or limited space, e.g. the surface of the soil, or under the canopy of a small patch of forest.

Native plant – A plant that occurred in a particular area before the arrival of European settlers in North America (i.e. not introduced by settlers)

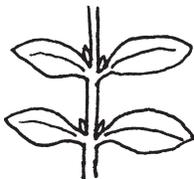
Nectar – A sugary liquid secreted by a flower’s nectaries

Node – The point on a stem from which a leaf grows; nodes are spaced along stems with internodes between them

Nodules (of a root) – Swollen areas of the root that contain a bacterial symbiont

Open Pollination – Pollination in which the source of pollen is unknown

Opposite – Arrangement of leaves in which each pair is at right angles to the pair above and below (see also “Alternate)



Ovary – Part of the female flower parts, located at the base of the pistil and containing ovules which can become seeds (See flower diagram on page 87.)

Ovule – Structure within the ovary containing an egg cell

Parkland – In the Canadian Prairie Provinces, Parkland is a transitional natural region between the prairies to the south and the boreal forest to the north. Patches of open meadows alternate with forest of largely poplar trees, with spruce trees on cool, north-facing slopes.

Perennial – Plants which grow and reproduce for many years, from the same roots. Perennial plants are usually woody.

Perfect Flowers – Flowers with male and female reproductive organs

Petals – Modified leaves, usually the conspicuous, brightly coloured structures above the sepals in a flower (See flower diagram on page 87.)

Petiole – Stalk of a leaf

Phenology – Study of the seasonal timing of life cycle events, i.e. growth stages or changes in plants and animals

Photoperiod – the number of hours of light that a plant receives in a day.

Photosynthetic – An organism that uses light energy to produce food

Photosynthesis – The process by which plants, algae and some bacteria convert light energy into the chemical energy stored in sugars

Phyllody – Process in which petals and sepals revert to leaves

Pistil – A collective term for all the female flower parts: stigma, style and ovary (See flower diagram on page 87.)

Pollen – Powdery contents of the anthers; a single pollen grain produces a pollen tube and sperm, and fertilizes ovules contained in a plant’s ovary



Pollen Sac – The pollen-containing sac of the anthers

Pollination – Process by which pollen is transferred from the male parts (stamen) to the female parts (stigma) of a flower

Polyploid – An organism with three or more sets of chromosomes

Ramets – A large number of clonal shoots

Respiration – Physiological process in plants and animals in which oxygen is consumed in the final step of metabolizing sugars

Rhizome – A stem which grows horizontally in the soil, bearing buds from which shoots grow

Rootstock – Plant roots onto which shoots are grafted, in propagation

Root Cutting – Cutting taken from the roots, used in plant propagation

Runner – A long, slender branch that runs along the ground rooting at the nodes or tip (see “Node”)

Scale – Any small, thin flat structure of a plant; a small outgrowth

Scree Slope – Mountain slope of small loose stones

Seed Capsule – Dry fruit that releases seed by way of pores or slits

Seed Head – A cluster of fruit or seeds

Seed Pod – General term for any dry fruit that opens to release seeds

Self-fertilize – Fertilization in which the pollen (sperm) and the ovary (egg) belong to the same individual. Compare with Cross-pollination.

Sepals – Modified petal-like leaves, below the petals in a flower, often green and leaf-like (See flower diagram on page 87.)

Softwood Cutting – Cutting taken from emerging woody plant parts of softwood trees, used for propagation

Stamen – Collective term for male flower parts; includes filaments and anthers (See flower diagram on page 87.)



Stigma – The receptive area of the pistil (top of the female flower part) where pollen lands or is deposited (See flower diagram on page 87.)

Stratification – Process in which seed is placed in moist, cool soil to break dormancy

Stratification Period – The amount of time required to break seed dormancy and start germination

Style – Central, tube-like region of the female flower parts (See flower diagram on page 87.)

Subalpine – Area in the higher mountain slopes just below the tree line and the alpine region

Succession – The process of development of vegetation involving changes of species and communities with time

Suckers – Shoots that arise from underground plant parts

Symbiont – An organism living in a relationship with another organism, where these two organisms live closely together for much or all of their lives, e.g. the fungi and algae in lichens

Tap Root – A large, vertical root arising from the main axis of the plant

Terminal – Applies to position of a structure borne at the tip of a plant stalk, leaf, etc.

Tundra – A treeless region of the Arctic or subarctic

Variety – A taxonomic group within a species or subspecies, i.e., a uniform group of plants that differs slightly from another group within the same species

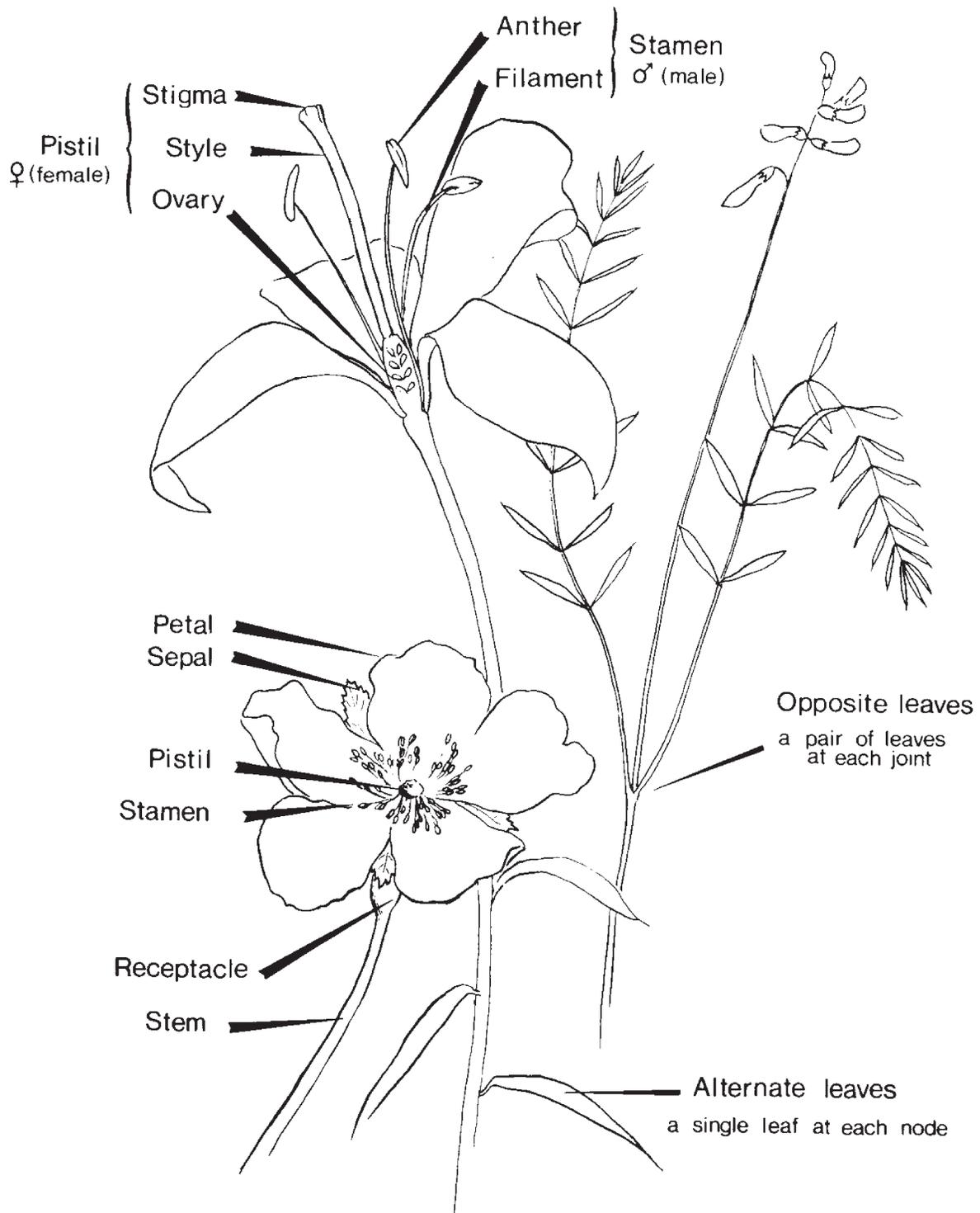
Vegetative Reproduction – Process through which plants increase in number without fertilization

Whorl – A group of three or more plant parts arising from the same region (node) of the stem

Winged – Structure with a membranous expansion

Winter Buds – Buds present in winter

PARTS OF A TYPICAL FLOWER



Reprinted with permission from Wildflowers of the Canadian Rockies by G.W. Scotter and H. Flygare ©1986

Map Sources for Canada

For a regularly updated list of map sources for your territory or province, check the federal website:

maps.nrcan.gc.ca

and select *Canadian topographic maps*, *map distributors*, and then, *regional distribution centres*.

Horticultural

All words highlighted in **blue** can be found in the glossary (Appendix 2).

ESTABLISHING A PLANTWATCH GARDEN

Introduction

This guide will serve as a resource to teachers in the Plantwatch Program who are interested in learning more about the cultivation and growth requirements of these key indicator plants. Some participants may find that their access to the plants in the wild state is limited (e.g., urban classrooms may find it hard to find white trilliums (eastern Canada) or prairie crocus (western Canada). One solution is for schools to create their own garden areas, using plants from the Plantwatch program and others that are native to their area. This approach not only provides special places in which to observe and record the timing of natural phenomenon such as plant flowering, but also gives opportunities for creating wildlife habitat (for birds, butterflies, etc.) and increasing local biodiversity.

Students are able to observe daily the changes in the Plantwatch species and accurately report the flowering stages. They will see first hand the effect of weather events such as spring snow storms or frosts on their plants. Temperature records from the site or nearby will provide highly useful information on the amount of heat needed for flowering. If students have access to the school grounds over the summer, they will see all stages of growth — from first buds, to flowers, to ripe fruit, as well as leaf colouring, and discover some of the insect partners that these plants attract.

Creating garden spaces in communities need not be an overwhelming task, if all the factors are considered.

The benefits of such a project go far beyond the project itself, as communities become involved with the land, its rhythms and its diversity. Natural areas offer a rich learning environment that can lead directly to a stronger environmental ethic for all who become involved.

Creating Garden Spaces

Individuals, communities or schools considering the creation of school garden spaces need to ask themselves some important questions. Assistance in answering these questions can be obtained from many sources individuals, organizations and printed materials.

1. What is the purpose of the garden space? Are you going to just plant certain Plantwatch species for observation, or are you going to expand your garden area to include other native plant species?
2. Is there a plan in place? Does the plan include a budget, a realistic time line, use of the expertise of other people who have initiated such garden spaces, and opportunities for learning about the plants and their requirements?
3. Has an appropriate site been located, taking into account the soils, topography and present condition of the land, along with the requirements of the plant communities you'd like to establish? If possible, sites should be located at least 3 m-5 m (10 - 15 ft.) away from buildings (to avoid hot microclimates that will affect bloom timing), and away from sidewalks or roads. Consideration

should also be given to ease of watering, and ways in which the site can be protected from students' outdoor play activities.

4. What kind of site preparation considerations are there? Proper cultivation of an area, to control weed growth, is necessary prior to the planting of a garden. The soil should be well packed with rollers before seeding, and have appropriate soil amendments added before planting live plants. Because native plants are well adapted to low fertility, they do not require heavy fertilization (which may only encourage the growth of weedy, non-native species). Avoid using herbicides as they pose a threat to valuable soil organisms and also threaten the health of children, pets, and living things in nearby rivers and lakes.
5. What species are you going to plant? For certain Plantwatch species, see section B following: "How to Grow the Plantwatch Species."
6. What planting methods are you going to use? The methods will vary, depending on whether you are working with seeds or live plant material. Things to consider would include best dates for planting and any special techniques for specific plants.
7. What kinds of long-term management strategies do you need to consider? Young shrubs of saskatoon and lilac may take three to four years before they begin flowering. How will you maintain weed control – by hand or mowing? Keep in mind that drought-adapted species such as saskatoon, prairie crocus, or white dryad should not be overwatered once established. How will the garden space be protected from unwanted intrusions?
8. How will you achieve public involvement and support? Can you involve a variety of people (principal, school staff, grounds crew, local business people, local gardeners for summer weeding and watering)? How will you educate others about your project? Finding funding for school gardens is relatively simple because these projects have so many benefits. Sources that we know have funded

similar projects include The Evergreen Foundation and Shell (see resource list for addresses).

HOW TO GROW SOME OF THE PLANTWATCH SPECIES

(lilac, prairie crocus, saskatoon, white dryad, and white trillium)

Common Purple Lilac

For those who want to plant new lilacs to observe, a recommended *cultivar* for Plantwatch observers is the early-flowering and popular *Syringa vulgaris* "Charles Joly", originally developed in 1896 in France by Lemoine. The flowers of this species are reddish-purple, slightly redder in colour than most common purple lilacs, but suitable for Plantwatch because they are early blooming and many nurseries have them for sale. Make sure your lilac is growing on its own roots, not *rootstocks*.

Common purple lilac (*Syringa vulgaris*) can be planted individually or in a line to form an unclipped hedge. Lilacs should be grown in fertile, moisture-retentive soil that is neutral to alkaline, not acidic. They will thrive in sun or partial shade but grow best in full sun. In a new garden be careful not to plant any trees in the vicinity of your lilacs. Over the years these trees will grow and eventually shade the lilacs, which then will produce fewer and fewer flowers. If your lilacs do get shaded, transplant them to a sunnier site. During dry spells, lilacs benefit from regular watering, particularly young or recently transplanted plants. This shrub is relatively free from major pests, but watch out for leaf miner and lilac borer.

Pruning

Lilacs should be pruned every five to ten years to maintain a good shape. Lilacs flower on the previous year's growth, so they should not be pruned in any way until after the flowers have died. The spent blossoms should be removed every year, to prevent wasting energy on seed formation and to stimulate flower bud formation. Prune immediately after flowering occurs

in spring because next year's buds will form on the new wood that grows after flowering. Don't prune in autumn as it will remove next year's flower buds. One or more of the older main stems at the base of a plant may be removed in pruning and some of the remaining stems trimmed back to maintain the size and shape desired. Remember, never remove more than one third of a lilac bush at any one time. Cut a branch back only to the first **node**, where new buds can be seen. If branches are cut back beyond this point, next year's flowers will be lost. After being transplanted, it may take several years for some lilacs to produce flowers.

Occasionally, a lilac may bloom the first year after being transplanted because the buds were set up in the nursery before the plant was bought. Usually, such a plant will not flower again for about three or four years, assuming the plant is growing in the full sun, and has a good supply of nutrients and moisture. Once a plant does begin to flower, it will continue to do so for many years.

The ultimate size of a mature lilac is one factor limiting the number of lilacs that any garden can satisfactorily hold. Because under ideal conditions common purple lilacs can reach a height of 2.5 m to 4 m (8-13 ft.), and have a spread of 6 m to 7 m (20-23 ft.), one has to be careful not to plant too many lilacs in a small, city garden.

Growing lilacs from seed

Lilacs can be grown from seed. If **open pollinated seed** is used there is no way of knowing if the new plant will be similar or quite different from the parent plant. Seed can be collected in the autumn, then dried, and the seed stored in a cool, dry place until February. Lilac seed requires a wet/cold **stratification** period to break the seed's natural **dormancy**. Seed may also be sown directly in the garden in the autumn. After the first freeze, the bed should be covered with a light mulch. In the spring, this mulch should be removed, and the bed should be shaded as the seedlings appear because these seedlings scorch very easily in direct sun.

Prairie Crocus

This welcome little sign of spring is sometimes difficult to grow in a garden. It can be started from seed collected from the wild, or purchased from nurseries specializing in native plants and seeds. Please do not attempt to transplant plants from the wild to the garden. This usually fails, and it contributes to loss of biodiversity in our remaining natural habitats! Growing prairie crocus from seed requires patience because not all the seeds will germinate the first year and because the plants are deep-rooted and slow to mature. Native plant seeds usually require **stratification** before planting, to break their natural **dormancy**; that is, they must be exposed to a cold and damp period prior to planting. To stratify prairie crocus seed, place the seed in a clean zip-loc bag or film container with a little sterilized dampened sand and refrigerate it from one to three weeks. Then plant the seeds in flats — they do not compete very well with other plants. Ideally, these plants should be grown in nursery conditions for the first year or two, and then transplanted to a garden in late fall or early spring.

Habitat Requirements

Prairie crocus likes a sandy soil that is never wet for more than a few hours. Once the plant has a well-established root system, do not water it during the summer unless the soil becomes very dry.

This plant needs to be planted in an open area with full sun. After a year or two, like other wild plants, it becomes dependent on **fungus partners** in the soil. Seedlings will flower in three or four years.

Note: In central Alberta, seed is best collected from the wild in June, when it is ripe.

Saskatoon/Serviceberry

Saskatoon is an excellent ornamental shrub for the garden. It is **hardy**, that is, it can withstand cold winters and drought, and is easily propagated, with fragrant showy flowers, edible fruit and attractive fall **foliage**. It also attracts birds! Many different varieties have been produced by horticulturalists for commercial

and garden use. If you'd like one in your own garden, saskatoon plants are available from many plant nurseries, in several different sizes and varieties. Plants that are old enough to produce flowers are, of course, more useful for the Plantwatch project.

Saskatoons can be started in several different ways including from seed, *suckers*, *root cuttings*, *softwood cuttings*, *hardwood cuttings*, and *crown division*. Saskatoon twigs can also be *grafted* onto other trees like apples and pears. When seeds are used, some of the plants grown from a batch of seed will be different from the parent stock.

When choosing a saskatoon for your garden, Plantwatch recommends the cultivar, "Smoky", as this *variety* blooms early. Choose plants that are not *grafted*. When plants arrive, remove them from the root trainer, and completely cover the root plug with soil. Firm soil around roots. Water as soon as possible, making sure that roots do not become exposed in the process. It usually takes the first year for the plants to establish their roots, so good care (e.g. occasional watering, effective weeding) at this time will ensure healthy plants for the future. Shallow cultivation is important, to protect the fragile roots, and to keep competing weeds from gaining a foothold.

Growing Saskatoons From Seed

Saskatoons can also be grown from seed. For guidelines on plant collection for the horticultural use of native plants visit http://www.anpc.ab.ca/assets/gardener_guidelines.pdf. Collect the fruit when it is ripe and freeze it. In the fall, or when you are ready, extract the seed from the fruit pulp (add the fruit to water in blender, use a few brief pulses to avoid damaging the seed, then pass the liquid through a sieve). Don't allow seed to dry as deep *dormancy* may result. Soak the seed 24 hours, then place it in small zip-lock bags with moist sand (four parts sand to one part seed) and place the bags in a refrigerator for four to five months. Occasionally examine the bags for germinating seeds. Plant when a seed germinates and the first root is seen. When potting new plants handle the plant very gently

to avoid breaking growing tips. Alternatively, cleaned seed can be sown in the fall and pots placed outside to take advantage of natural stratification. *Germination* will occur the following spring.

White Dryad, (White Mountain Avens, or Arctic and Alpine Dryad)

White dryads are attractive as garden plants because of the neat, trim leaves, abundant and long-lasting flowers and interesting seed heads. Several different commercial varieties are available. To minimize human impact on natural habitats, please do not attempt to move plants from the wild. Adult plants are hard to transplant anyway because of their large branching *taproot* system.

Growing White Dryad From Seed

For most success, sow ripe seed in seed pans filled with sandy, well-drained soil. If you have older seed, this seed will need to be stratified. Put the seed in sealable plastic bags, and put them in a refrigerator for two months at 4°C. After *germination*, transfer the seedlings to individual pots. Because white dryad has a long tap root, letting the plants grow a while in pots will reduce the amount of damage that can occur when the plant is being transplanted into a garden. Plants grown from seed take many years to flower.

Habitat Requirements

The dryad grows in *alpine* and in northern regions, so it is adapted to cool, dry places. It can tolerate moderate drought, and alkaline soils. If you want to grow white dryad in more southern, warmer places you must try to duplicate its favoured growing conditions as much as possible.

First, you need to ensure that your soil is quite coarse in texture so it has adequate drainage. Dryads like to be slightly dry, which can be facilitated if you add pebbles with a little peat moss to your soil. Or, you can plant white dryad in a rock garden among pebbles where there is good drainage but enough moisture to keep the soil from becoming too dry.

Second, your plants need to be protected from the

hot afternoon sun, so pick a spot that is shaded in the afternoon but will expose the plants to sun in the evening and/or morning.

Third, these plants do not thrive in conditions of shade or competition with other plants. These plants have a long branching *tap root*.

White Trillium

Trilliums can be grown in your garden; the problem is to get them started in the first place.

Do not try to transplant trilliums from the forest to the garden. It is very important to protect these species in the wild!

Forest wildflowers can take up to 15 years to flower and therefore are not economical for commercial greenhouses to grow from seeds or cuttings. For this reason some nurseries dig plants from the wild for resale, a practice that is a great threat to the biodiversity and health of our forests. FloraQuebeca, a Quebec conservation group, therefore recommends no selling or buying of forest flowers such as trillium, ladies' slipper orchid, dog-tooth violet, or spring beauty.

Growing Trilliums From Seed

If you still wish to grow trilliums and are very patient, they can be started from seed. Seeds should be harvested as soon as the capsules are ripe, and immediately planted. Germination is more likely if the seeds have experienced a frost, so it is better to sow in the fall. For germination to be successful, it is important that the seed be kept damp. Trilliums can take 15 years to flower after the seed germinates. Seedlings survive best in open soil away from plant competition, and away from heavy leaf mould.

Habitat Requirements

This plant is suitable for the shade garden, planted with other species that like cool damp conditions, such as primroses. Trilliums require a semi-shady location with good drainage, in neutral to slightly acid soils with some well rotted leaf mould (avoid heavy clay or sandy soils). The protection provided by nearby trees or shrubs

and a constantly moist soil will produce a healthier plant.

For more information on native plants and seed sources, visit the following websites.

NATIONAL

Evergreen Native Plant Database
www.evergreen.ca/nativeplants/index.php

Canadian Botanical Conservation Network
c/o Royal Botanical Gardens
Attention: David Galbraith
P.O. Box 399
Hamilton, Ontario L8N 3H8
www.rbg.ca/cbcn/en/index.html

BRITISH COLUMBIA

Native Plant Society of British Columbia
2012 William Street
Vancouver, British Columbia V5L 2X6
Tel: 604.255.5719
Fax: 604.258.0201
www.npsbc.org

ALBERTA

Alberta Native Plant Council Native Plant Source List.
www.anpc.ab.ca/assets/2007SourceList.pdf

SASKATCHEWAN

Saskatchewan Native Plant Society list of native plant sources.
www.npss.sk.ca/nps.php

MANITOBA

Prairie Habitats
www.prairiehabitats.com/
Manitoba Naturalists Society
401 - 63 Albert Street
Winnipeg, Manitoba R3B 1G4
www.manitobanature.ca

ONTARIO

Native Plant Resource Guide for Ontario
www.serontario.org/publications.htm

Acorus Restoration

722 6th Concession Road, R.R. #1
 Walsingham, Ontario N0E 1X0
 Phone: 519.586.2603
 Fax: 519.586.2447
 Email: info@ecologyart.com
www.ecologyart.com

QUEBEC**Montréal Botanical Garden**

4101 Sherbrooke East
 Montréal, Quebec H1X 2B2
www2.ville.montreal.qc.ca/jardin/en/menu.htm

NEW BRUNSWICK**New Brunswick Botany Club**

www.macbe.com/botanyclub/home.html

Save a Plant

16 Fletcher Court, Fredericton, New Brunswick E3A 4T4
 Tel.: 506.474.0801
 Email: saveaplant@nb.aibn.com

NOVA SCOTIA**Harriet Irving Botanical Gardens - Acadia University**

Acadia University
 Wolfville, Nova Scotia B4P 2R6
<http://botanicalgardens.acadiau.ca>
 Nova Scotia Wild Flora Society
 c/o Nova Scotia Museum of Natural History
 1747 Summer Street
 Halifax, Nova Scotia B3H 3A6
www.nswildflora.ca/

NEWFOUNDLAND AND LABRADOR**Dr. K. Wilf Nicholls**

Garden Director
 MUN Botanical Garden
 Memorial University
 St. John's, NL A1C 5S7
 709-737-3326
 709-737-8596 (fax)
wnicholl@mun.ca

YUKON**Environment Yukon**

www.environmentyukon.gov.yk.ca/wildlifebiodiversity/plants.php

Yellowstone to Yukon Conservation Initiative

www.y2y.net/

Canadian Curriculum Links

For the PlantWatch Teachers' Guide

USING THE CURRICULUM LINKS TABLES

Appendix 4 identifies the specific curriculum connection for science and math for each activity in the PlantWatch Teacher's Guide. The table is organized by province/territory. The following table will help you to find the pages where you can locate the specific curriculum connections for each activity by code.

	Grade 6	Grade 7	Grade 8
Atlantic	pages 99	pages 101	pages 103
Quebec	pages 105	pages 107	pages 108
Ontario	pages 109	pages 112	pages 114
Manitoba	pages 116	pages 118	pages 122
Saskatchewan	pages 123	pages 125	pages 126
Alberta	pages 129	pages 131	pages 134
BC/Yukon	pages 136	pages 137	pages 138
NT/NU	pages 139	pages 141	pages 145

The following Quick Reference Tables have been developed to help you locate the appropriate curriculum connections by grade or by subject.

Quick Reference Guide to Activity by Grade and Subject

K = Key Activity **S** = Science **M** = Math **So** = Social Studies **L** = Language Arts

		NWT/NUN.	BC/YUKON	ALBERTA	SASK.	MANITOBA	ONTARIO	QUEBEC	ATLANTIC
Grade	Subject	Activities							
6 (Cycle 3 in Quebec)	Science	K3, K4, K5, S1, S5	K2, K6, S1, S4, S5	S4, So3, L1, L2	S1, S3, S4, S5, M3, So1, So3	K1, K3, S1, M3, So2, So3, L1, L2	K3, K4, K5, K6, S1, S2, S4, S5, M3, So1, So2, L1, L2	K2, K3, K4, K5, K6, S1, S2, S5, M2, M3, MSo3, L1, L2	K1, K2, K3, K4, K5, K6, S2, S5, M3, So1, So2, So3, L1, L2
	Math	K4, K5, S2, S5, M1, M3, L1	K2, K4, S2, S5, M1, M3, L1	K4, S2, M1, M3, L1	K2, K3, K4, K6, S2, M1, M2, M3, M4, So1, L1	K2, K4, K6, S2, M1, M3, M4, So1, L1	K2, K4, K6, S2, M1, M2, M3, L1	K2, K4, S2, S5, M1, M4, So1	K4, K5, K6, S2, M1, M2, M4, So1
7 (Section I in Quebec)	Science	K2, K3, K4, K5, K6, S1, S2, S4, M1, M3, So1, So2, L1, L2	K3, S1, S4, S5	K2, K3, K4, K5, K6, S1, S2, S4, M1, M3, So1, So2, L1, L2	K2, K3, S3, M1, So3, L1	K1, K2, K3, K4, K6, S1, S4, M3, So2, So3, L1, L2	K1, K3, K4, K5, K6, S1, S4, S5, M3, L1	K2, K3, S1, S2, S5, M3, So1, So3, L1, L2	K2, K3, K4, K5, K6, S1, S2, S4, S5, M3, So2, So3, L1
	Math	S2, M1, M2, M4	S2, M1, M2, M4, S2, M1	K4, S2, M1, M2, M4, So1	M1, M2, M4, So1	K4, S2, M1, M2, M4, So1	K2, K4, K6, S2, M1, M2, M3, M4, So1, L1	K2, K4, K5, S2, M1, M3, L1	K4, K5, K6, S2, M1, M2, M4, MSo1
8 (Section II in Quebec)	Science	M3	K5, S2, S4, S5, M3, So3, L1	M3	K3, K5, K6, S1, S4, S5, M3, So1, So3, L1	M3, So2, So3, L1	M3	None	K3, K4, K5, K6, S1, M3
	Math	S2.M1	S2, M1	K4, K6, S2, M1	K2, K5, K6, S2, M1, M2, M3, L1	K4, S2, M1	K2, K4, K5, K6, M2, M3, M4, L1	K4, K5, M3	K4, K5, K6, S2, M1, M2, M3, M4, So1, L1

Quick Reference Table to Curriculum Links by Activity and Grade

	NWT/ NUNAVUT	BC/YUKON	ALBERTA	SASK.	MANITOBA	ONTARIO	QUEBEC	ATLANTIC
Activity	Grades with Curriculum Links (of Gr. 6, 7, 8)							
Key Activity 1	None	None	None	None	6, 7	7	None	6
Key Activity 2	7	None	7	6, 7, 8	6, 7	6, 7, 8	Cycle 3, Sec. I	6, 7
Key Activity 3	6, 7	7	7	6, 7, 8	6, 7	6, 7,	Cycle 3, Sec. I	6, 7
Key Activity 4	6, 7	6	6, 7, 8	6, 8	6, 7, 8	6, 7	Cycle 3, Sec. I, Sec. II	6, 7
Key Activity 5	6, 7	8	7	8	None	6, 7, 8	Cycle 3, Sec. I, Sec. II	6, 7, 8
Key Activity 6	7	6	7, 8	6, 8	6, 7	6, 7, 8	Cycle 3	6, 7, 8
Science 1	6, 7	6, 7	7	6, 8	6, 7	6, 7	Cycle 3, Sec. I	7, 8
Science 2	6, 7	6, 7, 8	6, 7, 8	6, 8	6, 7, 8	6, 7	Cycle 3, Sec. I	6, 7, 8
Science 3	None	None	None	6, 7	None	None	None	None
Science 4	7	6, 7, 8	6, 7	6, 8	7	6, 7	None	7
Science 5	6	6, 7, 8	None	Ga	None	6, 7	Cycle 3, Sec. I	6, 7
Math 1	6, 7, 8	6, 7, 8	6, 7, 8	6, 7, 8	6, 7, 8	6, 7	Cycle 3, Sec. I	6, 7, 8
Math 2	7	7	7	6, 7, 8	6, 7	6, 7, 8	Cycle 3	6, 7, 8
Math 3	6, 7, 8	6, 8	6, 7, 8	6, 8	6, 7, 8	6, 7, 8	Cycle 3, Sec. I, Sec. II	6, 7, 8
Math 4	7	7, 8	7	6, 7	6, 7	7, 8	Cycle 3	6, 7, 8
Social Studies 1	7	7, 8	7	6, 7, 8	6, 7	6, 7	Cycle 3, Sec. I	6, 7, 8
Social Studies 2	7	None	7	None	6, 7, 8	6	None	6, 7
Social Studies 3	None	8	6	6, 7, 8	6, 7, 8	None	Cycle 3, Sec. I	6, 7
Language Arts 1	6, 7	6, 8	6, 7	6, 7, 8	6, 7, 8	6, 7, 8	Cycle 3, Sec. I	6, 7, 8
Language Arts 2	7	None	6, 7	6, 7	6, 7	6	Cycle 3, Sec. I	6

Quick Reference Table to Curriculum Links by Activity and Subject

	NWT/ NUNAVUT	BC/YUKON	ALBERTA	SASK.	MANITOBA	ONTARIO	QUEBEC	ATLANTIC
Activity	Subjects with Curriculum Links for Grades 6, 7 and 8 (of Science and Math)							
Key Activity 1	Science		Science		Science	Science		Science
Key Activity 2	Science	Science, Math	Science	Science, Math	Science, Math	Math	Science, Math	Science
Key Activity 3	Science, Math	Science	Science, Math	Science, Math	Science	Science	Science	Science
Key Activity 4	Science, Math	Math	Science, Math	Math	Science, Math	Science, Math	Science, Math	Science, Math
Key Activity 5	Science, Math	Science	Science	Science, Math		Science, Math	Science, Math	Science, Math
Key Activity 6	Science	Science	Science, Math	Science, Math	Science, Math	Science, Math	Science	Science, Math
Science 1	Science	Science, Math	Science	Science	Science	Science	Science	Science
Science 2	Science, Math	Science, Math	Science, Math	Math	Math	Science, Math	Science, Math	Science, Math
Science 3				Science				
Science 4	Science	Science	Science	Science	Science	Science		Science
Science 5	Science, Math	Science, Math		Science		Science	Science, Math	Science
Math 1	Science, Math	Math	Science, Math	Science, Math	Math	Math	Math	Math
Math 2	Math	Math	Math	Math	Math	Math	Science	Math
Math 3	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math
Math 4	Math	Science, Math	Math	Math	Math	Math	Math	Science, Math
Social Studies 1	Science, Math	Math	Science, Math	Science, Math	Math	Science, Math	Math	Science, Math
Social Studies 2	Science		Science		Science	Science		Science
Social Studies 3		Science	Science	Science	Science		Science	Science
Lanuage Arts 1	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math	Science, Math
Lanuage Arts 2	Science, Math		Science		Science	Science	Science	Science

CHART OF PROVINCIAL/TERRITORIAL CURRICULUM CONNECTIONS FOR SCIENCE AND MATH FOR GRADES 6-8

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

ATLANTIC PROVINCES

NOTE: The math and science curriculum for the Atlantic Provinces is a result of a collaborative effort of the education departments of the four provinces, coordinated through the Atlantic Provinces Education Foundation/Council of Atlantic Ministers of Education and Training. Please refer to any of the Atlantic Provinces as a reference to the detailed curriculum learning outcomes. The following documents were used:

- Atlantic Canada Elementary Science Curriculum Guide (2002)
- Atlantic Canada Intermediate Science Curriculum Guide
- Grade 6 Mathematics Curriculum Guide (Interim Edition 2005)
- Grade 7 Mathematics Curriculum Guide (Interim Edition 2008)
- Grade 8 Mathematics Curriculum Guide (Interim Edition 2002)

NEWFOUNDLAND

www.ed.gov.nl.ca/edu/sp/pcdbs.htm

PRINCE EDWARD ISLAND

www.gov.pe.ca/educ/index.php3?number=74897&lang=E

NOVA SCOTIA

<https://sapps.ednet.ns.ca/Cart/index.php?UID=2009011516322024.222.131.202>

NEW BRUNSWICK

www.gnb.ca/0000/anglophone-e.asp#cd

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ATLANTIC PROVINCES (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	104-8 demonstrate the importance of using the languages of science and technology to compare and communicate ideas, processes, and results	N/A
K2	204-1 propose questions to investigate and practical problems to solve 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language	N/A
K3	104-8 demonstrate the importance of using the languages of science and technology to compare and communicate ideas, processes, and results 205-7 record observations using a single work, notes in point form, sentences and simple diagrams and charts	N/A
K4	205-7 record observations using a single work, notes in point form, sentences and simple diagrams and chart 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language	GCO F KSCO: iii) represent mathematical patterns and relationships in a variety of ways (including rules, tables and one- and two-dimensional graphs) SCO F4 use bar graphs, double bar graphs and stem-and-leaf plots to display data
K5	205-7 record observations using a single work, notes in point form, sentences and simple diagrams and chart 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language	GCO F: Students will solve problems involving the collection, display and analysis of data. SCO F1 choose and evaluate appropriate samples for data collection F2 identify various types of data sources KSCO: ii) construct a variety of data displays (including tables, charts and graphs) and consider their relative appropriateness
K6	206-9 identify new questions or problems that arise from what was learned	GCO F SCO: F9 explore relevant issues for which data collection assists in reaching conclusions
Other Activity		
S1	N/A	N/A
S2	204-8 identify appropriate tools, instruments, and materials to complete their investigations 205-7 record observations using a single work, notes in point form, sentences and simple diagrams and chart 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language	SCO: A6 demonstrate an understanding of the meaning of a negative integer B7 solve and create relevant addition, subtraction, multiplication and division problems involving whole numbers B11 calculate sums and differences in relevant contexts by using the most appropriate method KSCO: By the end of grade 6, students will have achieved the outcomes for entry-grade 3 and will also be expected to develop and apply measures of central tendency (mean, [median and mode])

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ATLANTIC PROVINCES (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S3	N/A	N/A
S4	N/A	N/A
S5	205-7 record observations using a single work, notes in point form, sentences and simple diagrams and chart 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language	N/A
M1	N/A	SCO: A6 demonstrate an understanding of the meaning of a negative integer B7 solve and create relevant addition, subtraction, multiplication and division problems involving whole numbers B11 calculate sums and differences in relevant contexts by using the most appropriate method KSCO: By the end of grade 6, students will have achieved the outcomes for entry-grade 3 and will also be expected to develop and apply measures of central tendency (mean, [median and mode])
M2	N/A	KSCO: By the end of grade 6, students will have achieved the outcomes for entry-grade 3 and will also be expected to develop and apply measures of central tendency (mean, [median and mode])
M3	Communication and Teamwork 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language	N/A
M4	N/A	B3 compute quotients of whole numbers and decimals using up to 2- digit whole number divisors
So1	Life Science: Diversity of Life: Adaptations and Natural Selection propose questions about the relationship between the structural features of organisms and their environment, and use a variety of sources to gather information about this relationship (204-1, 205-8)	Refer to M4
So2	STSE: Nature of Science and Technology 105-5 identify examples of scientific knowledge that have developed as a result of the gradual accumulation of evidence	N/A
So3	Life Science: Diversity of Life: Adaptations and Natural Selection propose questions about the relationship between the structural features of organisms and their environment, and use a variety of sources to gather information about this relationship (204-1, 205-8) Relationships Between Science and Technology 205-8 identify and use a variety of sources and technologies to gather pertinent information STSE 108-5 describe how personal actions help conserve natural resources and protect the environment in their region Refer to S3	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

ATLANTIC PROVINCES (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
L1	<p>Performing and Recording 205-7 record observations using a single work, notes in point form, sentences and simple diagrams and charts</p> <p>Communication and Teamwork 207-2 communicate procedures and results, using lists, notes in point form, sentences, charts, graphs, drawing, and oral language</p>	N/A
L2	<p>Performing and Recording 205-7 record observations using a single work, notes in point form, sentences and simple diagrams and charts</p>	N/A

ATLANTIC PROVINCES (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	<p>208-5 state a prediction and a hypothesis based on background information or an observed pattern</p> <p>1.04 List examples of organisms that live in each ecosystem</p> <p>Organize and record information collected in an investigation of an ecosystem using instruments effectively and accurately. (209-3, 209-4)</p>	N/A
K3	210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots.	N/A
K4	210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots.	<p>Strand: Statistics and Probability (Data Analysis)</p> <p>General Outcome: Collect, display and analyze data to solve problems.</p>
K5	210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots.	<p>Strand: Statistics and Probability (Data Analysis)</p> <p>General Outcome: Collect, display and analyze data to solve problems.</p>
K6	211-2 communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language, and other means.	<p>Strand: Statistics and Probability (Data Analysis)</p> <p>General Outcome: Collect, display and analyze data to solve problems.</p>
Other Activity		
S1	<p>Unit 1: Interactions within Ecosystems</p> <p>306-3 describe interactions between biotic and abiotic factors in an ecosystem.</p>	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ATLANTIC PROVINCES (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S2	<p>209-3 use instruments effectively and accurately for collecting data.</p> <p>208-5 state a prediction and a hypothesis based on background information or an observed pattern</p>	<p>General Outcome: Use patterns to describe the world and to solve patterns. Specific Outcome</p> <p>7PR2 Create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems.</p> <p>7N6. Demonstrate an understanding of addition and subtraction of integers, [concretely, pictorially and] symbolically.</p> <p>7SP1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> • determining the measures of central tendency (mean, median, mode) and range data with a single meaningful number.
S3	N/A	N/A
S4	<p>113-9 make informed decisions about applications of science and technology, taking into account environmental and social advantages and disadvantages.</p> <p>1.56 Make informed decisions about forest harvesting techniques taking into account the environmental advantages and disadvantages. (113-9)</p>	N/A
S5	<p>209-3 use instruments effectively and accurately for collecting data.</p> <p>210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots.</p>	N/A
M1	N/A	<p>7N6. Demonstrate an understanding of addition and subtraction of integers, [concretely, pictorially and] symbolically.</p> <p>7SP1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> • determining the measures of central tendency (mean, median, mode) and range data with a single meaningful number.
M2	N/A	<p>7SP1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> • determining the measures of central tendency (mean, median, mode) and range data with a single meaningful number.
M3	210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots.	N/A
M4	N/A	7SS3. Perform geometric constructions, including parallel line segments
So1	N/A	Refer to M4

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

ATLANTIC PROVINCES (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
So2	304-3 describe conditions essential to the growth and reproduction of plants [and microorganisms] in an ecosystem and relate these conditions to various aspects of the human food supply.	N/A
So3	Social and Environmental Contexts of Science and Technology 113-11 propose a course of action on social issues related to science and technology, taking into account personal needs. Refer to S3	N/A
L1	Performing and Recording 209-4 organize data using a format that is appropriate to the task or experiment. Analyzing and Interpreting 210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots. Communication and Teamwork 211-2 communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language, and other means.	N/A
L2	N/A	N/A

ATLANTIC PROVINCES (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	209-4 organize data using a format that is appropriate to the task or experiment	N/A
K4	209-4 organize data using a format that is appropriate to the task or experiment	GCO (C): Students will explore, recognize, represent, and apply patterns and relationships, both informally and formally. SCO: C1 represent patterns and relationships in a variety of formats and use these representations to predict unknown values
K5	209-4 organize data using a format that is appropriate to the task or experiment climates	GCO (C): Students will explore, recognize, represent, and apply patterns and relationships, both informally and formally. SCO: C1 represent patterns and relationships in a variety of formats and use these representations to predict unknown values
K6	N/A	GCO (C): Students will explore, recognize, represent, and apply patterns and relationships, both informally and formally. SCO: C1 represent patterns and relationships in a variety of formats and use these representations to predict unknown values C2 interpret graphs that represent linear and non-linear data

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ATLANTIC PROVINCES (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
Other Activity		
S1	306-3 describe interactions between biotic and abiotic factors in an ecosystem	N/A
S2	N/A	B12 add, subtract, multiply, and divide positive and negative decimal numbers with and without the calculator B13 solve and create problems involving addition, subtraction, multiplication, and division of positive and negative decimal numbers
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	B12 add, subtract, multiply, and divide positive and negative decimal numbers with and without the calculator B13 solve and create problems involving addition, subtraction, multiplication, and division of positive and negative decimal numbers
M2	N/A	B12 add, subtract, multiply, and divide positive and negative decimal numbers with and without the calculator B13 solve and create problems involving addition, subtraction, multiplication, and division of positive and negative decimal numbers
M3	Performing and Recording 209-4 organize data using a format that is appropriate to the task or experiment Analyzing and Interpreting 210-2 compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs, line graphs, and scatter plots 210-6 interpret patterns and trends in data, and infer and explain relationships among the variables	C1 represent patterns and relationships in a variety of formats and use these representations to predict unknown values C2 interpret graphs that represent linear and non-linear data F4 construct and interpret scatter plots [and determine a line of best fit by inspection]
M4	N/A	B12 add, subtract, multiply, and divide positive and negative decimal numbers with and without the calculator B13 solve and create problems involving addition, subtraction, multiplication, and division of positive and negative decimal numbers
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	C2 interpret graphs that represent linear and non-linear data
L2	N/A	N/A

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

QUÉBEC (CYCLE 3) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	Strategies: Exploration Strategies Putting forward hypothesis Anticipating the results of his or her approach	Measurement: Probability Predicting the likelihood of an event (certainty, possibility or impossibility)
K3	Living Things: Appropriate Language Drawings, sketches Strategies: Strategies for recording, using and interpreting information Using a variety of observational techniques and tools	N/A
K4	Living Things: Matter Reproduction of Plants and Animals Living Things: Appropriate Language Graphs Strategies: Communication Strategies Using tools to display information in tables and graphs or to draw a diagram	Measurement: Statistics Collecting, describing and organizing data using tables
K5	Strategies: Strategies for recording, using and interpreting information Using a variety of observational techniques and tools	
K6	Strategies: Exploration Strategies Studying a problem or phenomena from different points of view Formulating questions Putting forward hypothesis Exploring various ways of solving the problem	N/A
Other Activity		
S1	Living Things: Energy • Transformation of energy in living things (ecological pyramids) Appropriate Language • Drawings, sketches	N/A
S2	Energy: Techniques and instrumentation Use of simple measuring instruments Strategies: Exploration Strategies Putting forward hypothesis Anticipating the results of his or her approach	Integers: reading, writing, comparison, order, representation Natural numbers: -operation sense
S3	N/A	N/A
S4	N/A	N/A
S5	Energy: Techniques and instrumentation Use of simple measuring instruments Strategies: Exploration Strategies Formulating questions Putting forward hypothesis Living Things: Appropriate Language Terminology related to an understanding of living things Tables Drawings, sketches	Measurement: Temperatures, estimating and measuring Conventional units (C) Measurement: Probability Predicting the likelihood of an event (certainty, possibility or impossibility) Measurement: Statistics Collecting, describing and organizing data using tables

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

QUÉBEC (CYCLE 3) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M1	N/A	Integers: reading, writing, comparison, order, representation Natural numbers: -operation sense
M2	Living Things: Matter: Characteristics of Living Things • reproduction of plants and animals	N/A
M3	Living Things: Appropriate Language: Graphs Strategies Using different tools for recording information Using tools to display information in tables and graphs or to draw a diagram	N/A
M4	N/A	Geometry: Geometric figures and spatial sense constructing parallel Measurement: Lengths: estimating and measuring • relationships between units of measure
So1		Refer to M4
So2		N/A
So3	Living Things: Systems and Interaction Interaction between living organisms and their environment • adaptation Refer to S3	N/A
L1	Earth and Space Science: Systems and Interaction Meteorological systems and climates Living Things: Systems and Interaction Interaction between living organisms and their environment • living things and their habitats Living Things: Appropriate Language: • Terminology related to an understanding of living things Graphs Strategies Using different tools for recording information Using tools to display information in tables and graphs or to draw a diagram	N/A
L2	Living Things: Appropriate Language: Terminology related to an understanding of living things Strategies Using different tools for recording information Using a variety of observational techniques and tools	N/A

Québec Education Program Chapter 6.2: Mathematics, Science and Technology. www.mels.gouv.qc.ca/DGFJ/dp/programme_de_formation/primaire/pdf/educprg2001/educprg2001-062.pdf

QUÉBEC (SEC I) PROVINCIAL CURRICULUM OUTCOMES (CONCEPTS AND PROCESSES)

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	The Living World: Diversity of Life Forms Physical and behavioural adaptations Taxonomy	Statistics and Probability: Random Experiment: Event Certain, probable and impossible events Processing data from statistical reports Conducting a survey or a census Determining the population of a sample Gathering data
K3	The Living World: Diversity of Life Forms Habitat Species Physical and behavioural adaptations Taxonomy	N/A
K4	N/A	Statistics and Probability: Processing data from statistical report Organizing and choosing certain tools to present data constructing tables 'constructing graphs: bar graphs, broken line graphs, circle graphs highlighting some of the information that can be derived from a table or graphs
K5	N/A	Statistics and Probability: Processing data from statistical reports Conducting a survey or a census determining the population of a sample gathering data
K6	N/A	N/A
Other Activity		
S1	The Living World: Diversity of Life Forms Habitat Ecological niche Species Physical and behavioural adaptations Taxonomy Ecology T.O. 0.3 To identify the members of the living part of the environment. T.O. 1.1 To distinguish the different types of interactions that occur in the environment. T.O. 1.5 To identify, from examples, phenomena of living/living relationships. T.O. 1.6 To identify, from examples, phenomena of nonliving/living relationships. T.O. 1.7 To identify, from examples, phenomena of living/nonliving relationships.	N/A
S2	The Living World: Diversity of Life Forms Physical and behavioural adaptations Taxonomy	IO 2.2 To perform the following operations on integers: addition, subtraction, multiplication, division and exponentiation (exponents should be limited to the positive integers).
S3	N/A	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

QUÉBEC (SEC I) PROVINCIAL CURRICULUM OUTCOMES (CONCEPTS AND PROCESSES)...CONTINUED

Activity	Science	Mathematics
S4	N/A	N/A
S5	The Living World: Diversity of Life Forms Habitat Ecological niche Species Physical and behavioural adaptations Taxonomy	N/A
M1	N/A	Arithmetic and Algebra • Inverse operations: addition and subtraction, multiplication and division
M2	N/A	N/A
M3	The Living World: Diversity of Life Forms • Habitat	Arithmetic and Algebra (Processes): Different Ways of Writing and Representing Numbers • Using a variety of representations (e.g. Numerical, graphic)
M4	N/A	N/A
So1	The Living World: Diversity of Life Forms • Habitat	Refer to M4
So2	N/A	N/A
So3	The Living World: Diversity of Life Forms • Adaptation • Habitat Refer to S3	N/A
L1	The Living World: Diversity of Life Forms • Habitat	Arithmetic and Algebra (Processes): Different Ways of Writing and Representing Numbers • Using a variety of representations (e.g. Numerical, graphic)
L2	The Living World: Diversity of Life Forms • Habitat	N/A

Secondary Education: Ecology. www.mels.gouv.qc.ca/DGFJ/dp/programmes_etudes/secondaire/ecology.htm
Mathematics 116, Secondary I www.mels.gouv.qc.ca/GR-PUB/menu-curricu-a.htm

QUÉBEC (SEC II) PROVINCIAL CURRICULUM OUTCOMES (CONCEPTS AND PROCESSES)

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	N/A	N/A
K4	N/A	1.1 Intermediate Objectives To give a comprehensive description of a situation represented by a graph.
K5	N/A	1.1 Intermediate Objectives To give a comprehensive description of a situation represented by a table of values.
K6	N/A	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

QUÉBEC (SEC II) PROVINCIAL CURRICULUM OUTCOMES (CONCEPTS AND PROCESSES)...CONTINUED

Activity	Science	Mathematics
Other Activity		
S1	N/A	N/A
S2	N/A	N/A
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	N/A
M2	N/A	N/A
M3	N/A	TO 1.1 To translate one representation of a situation into another
M4	N/A	N/A
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	N/A
L2	N/A	N/A

Mathematics 216, Secondary II <http://www.mels.gouv.qc.ca/GR-PUB/menu-curricu-a.htm/science/programs.aspx>

ONTARIO (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	Data Management and Probability collect data by conducting a survey (e.g., use an Internet survey tool) or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements;
K3	Understanding Life Systems: Biodiversity 1.2 assess the benefits that human societies derive from biodiversity (e.g., thousands of products such as food, clothing, medicine, and building use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	N/A
K4	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	Data Management and Probability collect and organize discrete or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including continuous line graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software)

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ONTARIO (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
K5	<p>2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)</p> <p>(Optional activity complements one additional outcome)</p> <p>3.1 identify and describe the distinguishing characteristics of different groups of plants and animals</p>	N/A
K6	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	Data Management and Probability Read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., sports data in the newspaper, data from the Internet about movies), presented in charts, tables, and graphs (including continuous line graphs);
Other Activity		
S1	3.5 describe interrelationships within species, between species within each species of plant and between species [and explain how these interrelationships sustain biodiversity.]	N/A
S2	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	Data management and Probability: Data Relationships demonstrate an understanding of mean, and use the mean to compare two sets of related data, with and without the use of technology
S3	N/A	N/A
S4	1.1 analyse a local issue related to biodiversity (e.g., the effects of human activities on urban biodiversity, flooding of traditional Aboriginal hunting and gathering areas as a result of dam construction), taking different points of view into consideration (e.g., the points of view of members of the local community, business owners, people concerned about the environment, mine owners, local First Nations, Métis, Inuit), propose action that can be taken to preserve biodiversity, and act on the proposal.	N/A
S5	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	N/A
M1	N/A	Data management and Probability: Data Relationships demonstrate an understanding of mean, and use the mean to compare two sets of related data, with and without the use of technology
M2	N/A	Data management and Probability: Data Relationships demonstrate an understanding of mean, and use the mean to compare two sets of related data, with and without the use of technology

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ONTARIO (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M3	Developing Investigation and Communication Skills 2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	Data management and Probability: Collection and Organization of Data - collect and organize discrete or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including continuous line graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software); Data Relationships –read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., sports data in the newspaper, data from the Internet about movies), presented in charts, tables, and graphs (including continuous line graphs);
M4	N/A	N/A
So1	3.2 demonstrate an understanding of biodiversity as the variety of life on earth, including variety within each species of plant and animal, among species of plants and animals in communities, and among communities and the physical landscapes that support them	Refer to M4
So2	Relating Science and Technology to Society and the Environment 1.2 assess the benefits that human societies derive from biodiversity audiences and for a variety of purposes 3.6 identify everyday products that come from a diversity of organisms (e.g., traditional pain relievers are derived from the bark of the white willow tree; tofu is made from soybeans; silk is made from silkworm cocoons; nutritional supplements, shampoos, toothpastes, and deodorants contain pollen collected by bees)	N/A
So3	Refer to S3	N/A
L1	Relating Science and Technology to Society and the Environment 1.2 assess the benefits that human societies derive from biodiversity audiences and for a variety of purposes Developing Investigation and Communication Skills 2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., use a graphic organizer to show comparisons between organisms in various communities)	Data management and Probability: Collection and Organization of Data - collect and organize discrete or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including continuous line graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software); Data Relationships – read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., sports data in the newspaper, data from the Internet about movies), presented in charts, tables, and graphs (including continuous line graphs);
L2	3.2 demonstrate an understanding of biodiversity as the variety of life on earth, including variety within each species of plant and animal, among species of plants and animals in communities, and among communities and the physical landscapes that support them	N/A

The Ontario Curriculum Grades 1-8: Science and Technology, 2007 www.edu.gov.on.ca/eng/curriculum/elementary/scientec.html

The Ontario Curriculum Grades 1-8: Mathematics, 2005 www.edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ONTARIO (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	Understanding Life Systems, Interactions in the Environment 3.2 identify biotic and abiotic elements in an ecosystem, and describe the interactions between them (e.g., between hours of sunlight and the growth of plants in a pond; between a termite colony and a decaying log; between the soil, plants, and animals in a forest)	N/A
K2	N/A	Data Management and Probability – collect data by conducting a survey or an experiment to do with themselves their environment, issues in their school or content from another subject and record observations or measurements;
K3	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., design a multimedia presentation explaining the interrelationships between biotic and abiotic components in a specific ecosystem)	N/A
K4	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., design a multimedia presentation explaining the interrelationships between biotic and abiotic components in a specific ecosystem)	Data Management and Probability – collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including relative frequency tables and circle graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software)
K5	2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., design a multimedia presentation explaining the interrelationships between biotic and abiotic components in a specific ecosystem)	N/A
K6	3.2 identify biotic and abiotic elements in an ecosystem, and describe the interactions between them (e.g., between hours of sunlight and the growth of plants in a pond; between a termite colony and a decaying log; between the soil, plants, and animals in a forest)	Data Management and Probability – read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., temperature data or community data in the newspaper, data from the Internet about populations) presented in charts, tables, and graphs (including relative frequency tables and circle graphs);
Other Activity		
S1	3.1 demonstrate an understanding of an ecosystem (e.g., a log, a pond, a forest) as a system of interactions between living organisms and their environment 3.2 [identify biotic and abiotic elements in an Ecosystem, and] describe the interactions between them 3.9 describe Aboriginal perspectives on sustainability and describe ways in which they can be used in habitat and wildlife management	N/A
S2	N/A	Number Sense and Numeration—identify and compare integers found in real-life contexts (e.g., -10°C is much colder than $+5^{\circ}\text{C}$);
S3	N/A	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ONTARIO (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S4	3.2 identify biotic and abiotic elements in an ecosystem, and describe the interactions between them (e.g., between hours of sunlight and the growth of plants in a pond; between a termite colony and a decaying log; between the soil, plants, and animals in a forest)	N/A
S5	3.8 describe ways in which human activities and technologies alter balances and interactions in the environment (e.g., clear-cutting a forest, overusing motorized water vehicles, managing wolf-killings in Yukon)	N/A
M1	N/A	Number Sense and Numeration—identify and compare integers found in real-life contexts (e.g., -10°C is much colder than $+5^{\circ}\text{C}$);
M2	N/A	Operational Sense—solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., concrete materials, drawings, calculators) and strategies (e.g., estimation, algorithms);
M3	Developing Investigation and Communication Skills 2.7 use a variety of forms to communicate with different audiences and for a variety of purposes	Collection and Organization of Data—collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including relative frequency tables and circle graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software); in charts, tables, and graphs (including relative frequency tables and circle graphs); Data Relationships —read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., temperature data or community data in the newspaper, data from the Internet about populations) presented in charts, tables, and graphs (including relative frequency tables and circle graphs); —identify and describe trends, based on the distribution of the data presented in tables and graphs, using informal language; —make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs
M4	N/A	Operational Sense —solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., concrete materials, drawings, calculators) and strategies (e.g., estimation, algorithms); Geometric Properties —construct related lines (i.e., parallel; [perpendicular; intersecting at 30° , 45° , and 60°]), using angle properties and a variety of tools
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A

ONTARIO (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
L1	<p>Developing Investigation and Communication Skills</p> <p>2.4 use appropriate science and technology vocabulary, [including sustainability, biotic, ecosystem, community, population, and producer] in oral and written communication</p> <p>2.7 use a variety of forms to communicate with different audiences and for a variety of purposes</p>	<p>Collection and Organization of Data</p> <p>–collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools) and display the data in charts, tables, and graphs (including relative frequency tables and circle graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software); in charts, tables, and graphs (including relative frequency tables and circle graphs);</p> <p>Data Relationships</p> <p>–read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., temperature data or community data in the newspaper, data from the Internet about populations) presented in charts, tables, and graphs (including relative frequency tables and circle graphs);</p> <p>–identify and describe trends, based on the distribution of the data presented in tables and graphs, using informal language;</p> <p>–make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs</p>
L2	N/A	N/A

The Ontario Curriculum Grades 1-8: Science and Technology, 2007 www.edu.gov.on.ca/eng/curriculum/elementary/scientec.html

The Ontario Curriculum Grades 1-8: Mathematics, 2005 www.edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf

ONTARIO (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	
K2	N/A	Data Management and Probability collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements;
K3	N/A	N/A
K4	N/A	Data Management and Probability select an appropriate type of graph to represent a set of data, graph the data using technology, and justify the choice of graph (i.e., from types of graphs already studied, including histograms and scatter plots)
K5	N/A	Operational Sense –solve multi-step problems arising from real-life on texts and involving whole numbers and decimals, using a variety of tools (e.g., graphs, calculators) and strategies (e.g., estimation, algorithms);

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ONTARIO (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
K6	N/A	Data Management and Probability read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., election data or temperature data from the newspaper, data from the Internet about lifestyles), presented in charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots);
Other Activity		
S1	N/A	N/A
S2	N/A	N/A
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	N/A
M2	N/A	Operational Sense –solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., graphs, calculators) and strategies (e.g., estimation, algorithms);
M3	Developing Investigation and Communication Skills 2.6 use a variety of forms to communicate with different audiences and for a variety of purposes	Data Management and Probability Data Relationships –collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools), and display the data in charts, tables, and graphs (including histograms and scatter plots) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software); charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots); –read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., election data or temperature data from the newspaper, data from the Internet about lifestyles), presented in charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots); –make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs
M4	N/A	Operational Sense –solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., graphs, calculators) and strategies (e.g., estimation, algorithms);
So1	N/A	N/A
So2	N/A	N/A
So3	N/A	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ONTARIO (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
L1	N/A	<p>Data Management and Probability Data Relationships —collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Stat or Census At Schools), and display the data in charts, tables, and graphs (including histograms and scatter plots) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software); charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots);</p> <p>—read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., election data or temperature data from the newspaper, data from the Internet about lifestyles), presented in charts, tables, and graphs (including frequency tables with intervals, histograms, and scatter plots);</p> <p>—make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs</p>
L2	N/A	N/A

The Ontario Curriculum Grades 1-8: Science and Technology, 2007 www.edu.gov.on.ca/eng/curriculum/elementary/scientec.html

The Ontario Curriculum Grades 1-8: Mathematics, 2005 www.edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf

MANITOBA (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	6-1-08 Observe and describe the diversity of living things within the local environment. GLO: A1, C2, D1, E1	N/A
K2	N/A	6.SP.2 Select, justify and use appropriate methods of collecting data including questionnaires, experiments, databases, electronic media. [C, PS, T]
K3	6-1-08 Observe and describe the diversity of living things within the local environment. GLO: A1, C2, D1, E1	N/A
K4	N/A	6.SP.3 Graph collected data and analyze the graph to solve problems.[C, CN, PS]
K5	N/A	N/A
K6	N/A	6.SP.3 Graph collected data and analyze the graph to solve problems.[C, CN, PS]

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

MANITOBA (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
Other Activity		
S1	6-1-08 Observe and describe the diversity of living things within the local environment. GLO: A1, C2, D1, E1	N/A
S2	N/A	Number 6.N.7. Demonstrate an understanding of integers, concretely, pictorially, and symbolically. [C, CN, R, V]
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	Number 6.N.7. Demonstrate an understanding of integers, concretely, pictorially, and symbolically. [C, CN, R, V]
M2	N/A	N/A
M3	Analysing and interpreting 6-0-6A. Construct graphs to display data, and interpret and evaluate these and other graphs. 6-0-6C. Identify and suggest explanations for patterns and discrepancies in data. Scientific and Technological Skills and Attitudes C6. employ effective communication skills and utilize information technology to gather and share scientific and technological ideas and data	Patterns and Relations 6.PR.2. Represent and describe patterns and relationships using graphs and tables. [C, CN, ME, PS, R, V] Statistics and Probability 6.SP.1. Create, label, and interpret line graphs to draw conclusions. [C, CN, PS, R, V] 6.SP.3. Graph collected data and analyze the graph to solve problems. [C, CN, PS]
M4	N/A	Number 6.N.8. Demonstrate an understanding of multiplication and division of decimals involving 1-digit whole-number multipliers
So1	N/A	Refer to M4
So2	Nature of Science and Technology (General Learning Outcomes) A4. identify and appreciate contributions made by women and men from many societies and cultural backgrounds towards increasing our understanding of the world and in bringing about technological innovations Science, Technology, Society and the Environment (General Learning Outcomes) B2. recognize that scientific and technological endeavors have been and continue to be influenced by human needs and the societal context of the time Diversity of Living Things 6-1-15 Identify and describe the contributions of scientists and naturalists who have increased our understanding of the diversity of living things.	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

MANITOBA (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
So3	<p>Science, Technology, Society and the Environment (General Learning Outcomes) B5. identify and demonstrate actions that promote a sustainable environment, society and economy, both locally and globally</p> <p>Scientific and Technological Skills and Attitudes (General Learning Outcomes) C6. employ effective communication skills and utilize information technology to gather and share scientific and technological ideas and data</p> <p>Researching 6-0-2A. Access information using a variety of sources. 6-0-2C. Make notes on a topic, combining information from more than one source and reference sources appropriately.</p> <p>6-0-9F. Frequently and thoughtfully evaluate the potential consequences of their actions.</p> <p>Refer to S3</p>	N/A
L1	<p>Nature of Science and Technology (General Learning Outcomes) A4. identify and appreciate contributions made by women and men from many societies and cultural backgrounds towards increasing our understanding of the world and in bringing about technological innovations</p> <p>Observing, Measuring, Recording 6-0-5A. Make observations that are relevant to a specific question. 6-0-5F. Record and organize observations in a variety of ways.</p>	<p>Patterns and Relations 6.PR.2. Represent and describe patterns and relationships using graphs and tables. [C, CN, ME, PS, R, V]</p>
L2	<p>Observing, Measuring, Recording 6-0-5A. Make observations that are relevant to a specific question. 6-0-5F. Record and organize observations in a variety of ways.</p> <p>Diversity of Living Things 6-1-08 Observe and describe the diversity of living things within the local environment.</p>	N/A

K-8 Mathematics Manitoba Curriculum Framework of Outcomes. 2008. www.edu.gov.mb.ca/k12/cur/math/framework_k-8/index.html

Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes www.edu.gov.mb.ca/k12/cur/science/scicurr.html

MANITOBA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	<p>7-1-01 Use appropriate vocabulary related to their investigations of interactions within ecosystems. Include: ecosystem, biosphere, abiotic, biotic, organisms, ecological succession, photosynthesis, cellular respiration, ecological pyramid, bioaccumulation, scavengers, decomposers, micro-organisms GLO: C6, D2</p>	N/A

APPENDICES

LEGEND:
K - Key activity **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

MANITOBA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
K2	7-1-01 Use appropriate vocabulary related to their investigations of interactions within ecosystems. Include: ecosystem, biosphere, abiotic, biotic, organisms, ecological succession, photosynthesis, cellular respiration, ecological pyramid, bioaccumulation, scavengers, decomposers, micro-organisms GLO: C6, D2	N/A
K3	7-1-01 Use appropriate vocabulary related to their investigations of interactions within ecosystems. Include: ecosystem, biosphere, abiotic, biotic, organisms, ecological succession, photosynthesis, cellular respiration, ecological pyramid, bioaccumulation, scavengers, decomposers, micro-organisms GLO: C6, D2 1-03 Identify abiotic and biotic components of ecosystems that allow particular organisms to survive. GLO: D1, D2, E2	N/A
K4	7-1-01 Use appropriate vocabulary related to their investigations of interactions within ecosystems. Include: ecosystem, biosphere, abiotic, biotic, organisms, ecological succession, photosynthesis, cellular respiration, ecological pyramid, bioaccumulation, scavengers, decomposers, micro-organisms GLO: C6, D2	General Outcome Collect, display, and analyze data to solve problems
K5	N/A	N/A
K6	7-1-01 Use appropriate vocabulary related to their investigations of interactions within ecosystems. Include: ecosystem, biosphere, abiotic, biotic, organisms, ecological succession, photosynthesis, cellular respiration, ecological pyramid, bioaccumulation, scavengers, decomposers, micro-organisms GLO: C6, D2	N/A
Other Activity		
S1	-1-03 Identify abiotic and biotic components of ecosystems that allow particular organisms to survive. GLO: D1, D2, E2	N/A
S2	N/A	Number 7.N.2. Demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] 7.N.6. Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically. [C, CN, PS, R, V] Statistics and Probability 7.SP.1. Demonstrate an understanding of central tendency and range by determining the measures of central tendency (mean, median, mode) and range [C, PS, R, T]
S3	N/A	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

MANITOBA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S4	<p>7-1-05 Identify and describe positive and negative examples of human interventions that have an impact on ecological succession or the makeup of ecosystems. Examples: positive - protecting habitats, reintroducing species; negative - preventing natural fires, introducing non-indigenous species, draining wetlands for agriculture or housing GLO: B5, D2, E2, E3</p> <p>7-1-06 Identify environmental, social, and economic factors that should be considered in the management and preservation of ecosystems. Examples: habitat preservation, recreation, employment, industrial growth, resource development GLO: B1, B5, D2, E2</p> <p>7-1-12 Provide examples of scavengers and decomposers, and describe their role in cycling matter in an ecosystem. Include: micro-organism GLO: D2, E1, E2, E3</p>	N/A
S5	N/A	N/A
M1	N/A	<p>Number 7.N.2. Demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T]</p> <p>7.N.6. Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically. [C, CN, PS, R, V]</p> <p>Statistics and Probability 7.SP.1. Demonstrate an understanding of central tendency and range by determining the measures of central tendency (mean, median, mode) and range [C, PS, R, T]</p>
M2	N/A	<p>Statistics and Probability 7.SP.1. Demonstrate an understanding of central tendency and range by determining the measures of central tendency (mean, median, mode) and range [C, PS, R, T]</p>
M3	Analysing and Interpreting 7-0-6A. Construct graphs to display data, and interpret and evaluate these and other graphs.	N/A
M4	N/A	<p>Space and Shape 7.SS.3. Perform geometric constructions, including parallel line segments [CN, R, V] .</p>
So1	N/A	Refer to M4

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

MANITOBA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
So2	<p>Nature of Science and Technology (General Learning Outcomes) A4. identify and appreciate contributions made by women and men from many societies and cultural backgrounds towards increasing our understanding of the world and in bringing about technological innovations</p> <p>Science, Technology, Society and the Environment (General Learning Outcomes) B2. recognize that scientific and technological endeavors have been and continue to be influenced by human needs and the societal context of the time</p> <p>Demonstrating Scientific and Technological Attitudes 7-0-9A. Appreciate and respect that science has evolved from different views held by women and men from a variety of societies and cultural backgrounds.</p>	N/A
So3	<p>Science, Technology, Society and the Environment (General Learning Outcomes) B5. identify and demonstrate actions that promote a sustainable environment, society and economy, both locally and globally</p> <p>Scientific and Technological Skills and Attitudes (General Learning Outcomes) C6. employ effective communication skills and utilize information technology to gather and share scientific and technological ideas and data</p> <p>Researching 7-0-2A. Access information using a variety of sources.</p> <p>Reflecting on Science and Technology 7-0-8G. Discuss societal, environmental, and economic impacts of scientific and technological endeavours.</p>	N/A
L1	<p>Nature of Science and Technology (General Learning Outcomes) A4. identify and appreciate contributions made by women and men from many societies and cultural backgrounds towards increasing our understanding of the world and in bringing about technological innovations</p> <p>Observing, Measuring, Recording 7-0-5A. Make observations that are relevant to a specific question.</p> <p>Analysing and Interpreting 7-0-6A. Construct graphs to display data, and interpret and evaluate these and other graphs.</p> <p>Demonstrating Scientific and Technological Attitudes 7-0-9A. Appreciate and respect that science has evolved from different views held by women and men from a variety of societies and cultural backgrounds.</p>	N/A
L2	<p>Observing, Measuring, Recording 7-0-5A. Make observations that are relevant to a specific question.</p>	N/A

K-8 Mathematics Manitoba Curriculum Framework of Outcomes. 2008. www.edu.gov.mb.ca/k12/cur/math/framework_k-8/index.html
 Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes www.edu.gov.mb.ca/k12/cur/science/scicurr.html

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

MANITOBA (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	N/A	N/A
K4	N/A	General Outcome: Collect and analyze data to solve problems
K5	N/A	N/A
K6	N/A	N/A
Other Activity		
S1	N/A	N/A
S2	N/A	Number 8.N.7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically. [C, CN, PS, R, V]
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	Number 8.N.7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically. [C, CN, PS, R, V]
M2	N/A	N/A
M3	8-0-6A. Construct graphs to display data, and interpret and evaluate these and other graphs.	N/A
M4	N/A	N/A
So1	N/A	Refer to M4
So2	Nature of Science and Technology (General Learning Outcomes) A4. identify and appreciate contributions made by women and men from many societies and cultural backgrounds towards increasing our understanding of the world and in bringing about technological innovations Science, Technology, Society and the Environment (General Learning Outcomes) B2. recognize that scientific and technological endeavors have been and continue to be influenced by human needs and the societal context of the time	N/A
So3	Science, Technology, Society and the Environment (General Learning Outcomes) B5. identify and demonstrate actions that promote a sustainable environment, society and economy, both locally and globally Scientific and Technological Skills and Attitudes (General Learning Outcomes) C6. employ effective communication skills and utilize information technology to gather and share scientific and technological ideas and data Also: Refer to S3	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

MANITOBA (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
L1	Nature of Science and Technology (General Learning Outcomes) A4. identify and appreciate contributions made by women and men from many societies and cultural backgrounds towards increasing our understanding of the world and in bringing about technological innovations	N/A
L2	N/A	N/A

K-8 Mathematics Manitoba Curriculum Framework of Outcomes. 2008. http://www.edu.gov.mb.ca/k12/cur/math/framework_k-8/index.html

SASKATCHEWAN (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	
K2	N/A	Data Management: Collecting D-1 acquire data through a. surveys, questionnaires b. experiments c. observation d. published information
K3	N/A	Data Management: Collecting D-1 acquire data through a. surveys, questionnaires b. experiments c. observation d. published information
K4	N/A	Data Management: Collecting D-1 acquire data through a. surveys, questionnaires b. experiments c. observation d. published information Organizing and Displaying D-9 display data using a. histograms, line graphs (broken) b. frequency diagrams, tally c. circle graphs (fractional)
K5	N/A	
K6	N/A	Data Management: Summarizing and Interpreting D-14 discuss, interpret, and ascribe meaning to the organized data
Other Activity		
S1	Ecosystems 1.2 Identify interrelationships among the biotic and abiotic components of an ecosystem 1.4 Appreciate the importance of food webs in conveying information about interrelationships in the local community 2.4 Explain how living organisms cooperatively share an environment.	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

SASKATCHEWAN (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S2	N/A	To be filled in with M1
S3	Earth's Climate 3.1 Recognize that climatic change can take place over prolonged periods of time 3.3 Evaluate theories of climatic change.	N/A
S4	Inquire into the effects of change in an ecosystem. 1. Identify some events that cause change. 2. Examine an ecosystem that has experienced change. 3. Appreciate the fragile nature of ecosystems. 4. Explain how living organisms cooperatively share an environment.	N/A
S5	1. Investigate factors which influence an ecosystem . 1. Recognize abiotic and biotic components of an ecosystem . 2. Identify interrelationships among the biotic and abiotic components of an ecosystem. 3. Acquire skills in estimating the population of an area. 4. Appreciate the importance of food webs in conveying information about interrelationships in the local community. 2. Inquire into the effects of change in an ecosystem. 1. Identify some events that cause change. 2. Examine an ecosystem that has experienced change. 3. Appreciate the fragile nature of ecosystems. 4. Explain how living organisms cooperatively share an environment. 5. Illustrate ways that change cascades through an ecosystem. 6. Identify changes that have global implications. 7. Assess pressures on various populations. 3. Develop a sense of responsibility for the preservation of the ecosphere. 1. Identify direct personal links to the local ecosystem. 2. Investigate the impact that humans have on ecosystems. 3. Recognize the role that humans play in protecting or destroying ecosystems. 4. Demonstrate actions that will ensure the health of the local ecosystem.	N/A
M1	N/A	Problem Solving: Understanding P-1 establish and/or demonstrate an understanding of a problem by b: interpreting tables, charts, and graphs Numbers and Operations Analysis: Whole Numbers N-16 recognize and solve a variety of problems involving a. addition, subtraction, multiplication, or division more than one operation Numbers and Operations Analysis: Integers: N-33 represent integers by using objects, pictures, words, and symbols N-34 recognize uses of integers in the real world Numbers and Operations Analysis: Rational Numbers: Decimal Numbers N-59 recognize and solve problems involving operations with decimal numbers

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

SASKATCHEWAN (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M2	N/A	Numbers and Operations Analysis: N-16 recognize and solve a variety of problems involving a. addition, subtraction, multiplication, or division more than one operation Numbers and Operations Analysis: Rational Numbers: Decimal Numbers N-59 recognize and solve problems involving operations with decimal numbers
M3	Earth's Climate 1. Describe the Saskatchewan climate Recognize long-term climatic patterns. Develop a positive disposition towards lifelong learning.	Problem Solving: Reflecting: P-11 display the results using a variety of means such as graphs, charts, or statements
M4	N/A	Geometry/Measurement : Angles, Lines and Line Segments G/M-1 recognize, draw, name, and describe or define a. parallel lines, perpendicular lines
So1	Earth's Climate 1. Describe the Saskatchewan climate. Recognize long-term climatic patterns.	Refer to M4
So2	N/A	N/A
So3	Earth's Climate 1. Describe the Saskatchewan climate Recognize long-term climatic patterns. Develop a positive disposition towards lifelong learning.	N/A
L1	N/A	Problem Solving: Reflecting: P-11 display the results using a variety of means such as graphs, charts, or statements
L2	N/A	N/A

Science: A Curriculum Guide for the Middle Level www.sasked.gov.sk.ca/docs/midlsci/midlsci.html September 1993

Mathematics: A Curriculum Guide for the Middle Level www.sasklearning.gov.sk.ca/docs/midmath/midmath.html 1996

SASKATCHEWAN (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	Basics of Life 1.4 Observe and describe attributes of life in macro-organisms, both those kept in captivity and those in their natural habitats.	N/A
K3	Basics of Life 2.3 Observe and describe the reactions of organisms in their natural environment.	N/A
K4	N/A	N/A
K5	N/A	N/A
K6	N/A	N/A
Other Activity		
S1	N/A	N/A
S2	N/A	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

SASKATCHEWAN (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S3	Basics of Life 2.4 Examine how natural and human-related alterations to the local environments during the past two hundred years have changed the ability of organisms to survive.	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	3. Temperature and Heat Recognize differences between heat and temperature.	N7.6. Demonstrate an understanding of addition and subtraction of integers, [concretely, pictorially and] symbolically. SP7.1. Demonstrate an understanding of central tendency and range for sets of data.
M2	N/A	N7.2 Expand and demonstrate understanding of the addition, subtraction, multiplication, and division of decimals to greater numbers of decimal places, and the order of operations. SP7.1. Demonstrate an understanding of central tendency and range for sets of data.
M3	N/A	N/A
M4	N/A	SS7.3 Demonstrate an understanding of 2-D relationships involving lines and angles.
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	Saskatchewan: The Land Understand and use the vocabulary and forms of expression which ecologists and geographers use to describe the environment.	N/A
L2	N/A	N/A

Grade 7 Mathematics Curriculum (2007) www.sasked.gov.sk.ca/docs/math_curricula/g7_math_curr_2007.pdf

Science: A Curriculum Guide for the Middle Level www.sasked.gov.sk.ca/docs/midlsci/midlsci.html September 1993

SASKATCHEWAN (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	Data Management: Collecting D-1 acquire data through a. surveys, questionnaires b. research c. interviews D-2 recognize that the data collected are affected by a. the nature of the sample b. the method of collection c. the sample size d. biases

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

SASKATCHEWAN (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
K3	Optional Unit: Plant Growth 1.1 Identify factors important for plant growth.	N/A
K4		N/A
K5	Adaptation and Succession 1.6 Examine the behaviours and mechanisms by which organisms make use of and coexist with the abiotic components of the ecosystem.	Data Management: Collecting D-14 discuss, interpret, and ascribe meaning to the organized data
K6	Optional Unit: Plant Growth 1.1 Identify factors important for plant growth.	Data Management: Collecting D-14 discuss, interpret, and ascribe meaning to the organized data
Other Activity		
S1	Adaptation and Succession 1.4 Recognize energy sources and energy flows in the ecosystem. 1.6 Examine the behaviours and mechanisms by which organisms make use of and coexist with the abiotic components of the ecosystem. 1.7 Explore the behaviours and mechanisms by which organisms make use of and coexist with other biotic components of the ecosystem.	N/A
S2	N/A	Math Activity 1
S3	N/A	N/A
S4	Adaptation and Succession 2 Examine how living things alter their environment. 2.1. Find examples of succession in the ecosystems of your area. 2.2 . Observe and describe the rate of environmental change. 2.3. Assess how living organisms contribute to environmental change. 2.4 .Evaluate the effect of succession on ecosystems.	N/A
S5	Adaptation and Succession 1.5 Appreciate how abiotic factors influence how populations which develop. 1.6. Examine the behaviours and mechanisms by which organisms make use of, and coexist with, the abiotic components of the ecosystem. 1.7. Explore the behaviours and mechanisms by which organisms make use of and coexist with other biotic components of the ecosystem. 2.0 Examine how living things alter their environment. 2.1.Find examples of succession in the ecosystems of your area. 2.2 Observe and describe the rate of environmental change. 2.3. Assess how living organisms contribute to environmental change. Optional Unit: Plant Growth 1.1 Identify factors important for plant growth.	N/A

APPENDICES

LEGEND: **K** - Key activity **SUBJECT-SPECIFIC ACTIVITIES:** **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

SASKATCHEWAN (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M1	N/A	<p>Numbers and Operations: Place Value: N-1 read, write the symbols for, read words for, and express orally any decimal number</p> <p>Numbers and Operations and Analysis: Whole Numbers N-16 recognize and solve a variety of problems involving a. more than one operation</p> <p>Numbers and Operations and Analysis: Integers N-32 recognize and solve a variety of problems involving positive and negative integers</p> <p>Numbers and Operations and Analysis: Decimal Numbers N-59 recognize and solve problems involving operations with decimal numbers</p>
M2	N/A	<p>Numbers and Operations: Place Value: N-1 read, write the symbols for, read words for, and express orally any decimal number</p> <p>N-5 round a number to the nearest a. hundred or tenth</p>
M3	<p>Plant Growth 1. Explore the factors which influence plant growth.</p>	<p>Problem Solving: Reflecting: P-11 display the results using a variety of means such as graphs, charts, or statements</p> <p>Data Management: Summarizing and Interpreting D18 read various charts and schedules and use the information gained to solve problems</p>
M4	N/A	N/A
So1	<p>Plant Growth 1. Explore the factors which influence plant growth.</p>	Refer to M4
So2	N/A	N/A
So3	<p>Adaptation and Succession 1. Recognize how abiotic components of an ecosystem support and influence life</p> <p>Plant Growth 1. Explore the factors which influence plant growth.</p> <p>Refer to S3</p>	N/A
L1	<p>Plant Growth 1. Explore the factors which influence plant growth.</p>	<p>Problem Solving: Reflecting: P-11 display the results using a variety of means such as graphs, charts, or statements</p> <p>Data Management: Summarizing and Interpreting D18 read various charts and schedules and use the information gained to solve problems</p>
L2	N/A	N/A

Science: A Curriculum Guide for the Middle Level www.sasked.gov.sk.ca/docs/midlsci/midlsci.html September 1993

Mathematics: A Curriculum Guide for the Middle Level www.sasklearning.gov.sk.ca/docs/midlmath/midlmath.html 1996

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ALBERTA (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	N/A	N/A
K4	N/A	Statistics and Probability (Data Analysis) General Outcome Collect, display and analyze data to solve problems. Specific Outcomes 1. Create, label and interpret line graphs to draw conclusions. [C, CN, PS, R, V]
K5	N/A	N/A
K6	N/A	N/A
Other Activity		
S1	N/A	N/A
S2	N/A	Number 2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4] 7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]
S3	N/A	N/A
S4	General Learner Expectations Students will: 6–10 Describe characteristics of trees and the interaction of trees with other living things in the local environment. Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials and for a life-supporting environment. Describe kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things. Identify human actions that enhance or threaten the existence of forests. Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.	N/A
S5	N/A	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ALBERTA (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M1	N/A	Number 2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4] 7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]
M2	N/A	N/A
M3	N/A	Patterns and Relations 1. Represent and describe patterns and relationships, using graphs and tables. [C, CN, ME, PS, R, V] [ICT: C6–2.3] Statistics and Probability 1. Create, label and interpret line graphs to draw conclusions. [C, CN, PS, R, V] 3. Graph collected data, and analyze the graph to solve problems. [C, CN, PS, R, T] [ICT: C6–2.5, C7–2.1, P2–2.1, P2–2.2] 7. Read and interpret graphs that are provided. [C, E, PS, R]
M4	N/A	N/A
So1	N/A	Refer to M4
So2		N/A
So3	Science Inquiry: Explore and Investigate identify sources of information and ideas and demonstrate skill in accessing them. Sources may include library, classroom, community and computer-based resources Attitudes a sense of personal and shared responsibility for actions taken Refer to S3	N/A
L1	Science Inquiry: Reflect and Interpret • record observations and measurements accurately, using a chart format where appropriate. Computer resources may be used for record keeping and for display and interpretation of data progress	Patterns and Relations 1. Represent and describe patterns and relationships, using graphs and tables. [C, CN, ME, PS, R, V] [ICT: C6–2.3] Statistics and Probability 7. Read and interpret graphs that are provided. [C, E, PS, R]
L2	Science Inquiry: Reflect and Interpret • record observations and measurements accurately, using a chart format where appropriate. Computer resources may be used for record keeping and for display and interpretation of data progress	N/A

Mathematics Kindergarten to Grade 9 Program of Studies (2007) <http://education.alberta.ca/teachers/program/math/programs.aspx>
 Elementary Science. 1996 <http://education.alberta.ca/teachers/program/science/programs.aspx>
 Junior High Science 7–8–9. 2003 <http://education.alberta.ca/teachers/program/science/programs.aspx>

LEGEND:

K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ALBERTA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	Interactions and Ecosystems, STSE investigate and interpret evidence of interaction and change (e.g., population fluctuations, changes in weather, availability of food or introduction of new species into an ecosystem) Skills Outcome: state a prediction and a hypothesis based on background information or an observed pattern of events	N/A
K3	Interactions and Ecosystems, STSE investigate a variety of habitats, and describe and interpret distribution patterns of living things found in those habitats (e.g., describe and compare two areas within the school grounds—a relatively undisturbed site and a site that has been affected by heavy use; describe and compare a wetland and a dry land area in a local parkland)	N/A
K4	Interactions and Ecosystems Analyzing and interpreting compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs (e.g., illustrate a food web, based on observations made within a given environment)	Statistics and Probability General Outcome Collect, display and analyze data to solve problems.
K5	Interactions and Ecosystems, Performing and Recording use tools and apparatus effectively and accurately for collecting data (e.g., measure factors, such as temperature, moisture, light, shelter and potential sources of food, that might affect the survival and distribution of different organisms within a local environment)	N/A
K6	Interactions and Ecosystems, Analyzing and Interpreting identify strengths and weaknesses of different methods of collecting and displaying data (e.g., compare two different approaches to measuring the amount of moisture in an environment; analyze information presented by proponents on two sides of an environmental issue)	N/A
Other Activity		
S1	Interactions and Ecosystems, STSE investigate and interpret evidence of interaction and change (e.g., population fluctuations, changes in weather, availability of food or introduction of new species into an ecosystem)	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ALBERTA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S2	<p>Performing and Recording: use tools and apparatus effectively and accurately for collecting data (e.g., measure factors, such as temperature, moisture, light, shelter and potential sources of food, that might affect the survival and distribution of different organisms within a local environment)</p>	<p>Number</p> <p>2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4]</p> <p>7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]</p> <p>8. Demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors). [C, CN, ME, PS, R, V]</p> <p>Statistics and Probability (Data Analysis)</p> <p>1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> determining the measures of central tendency (mean, median, mode) and range
S3	N/A	N/A
S4	<p>Interactions and Ecosystems, STSE</p> <p>describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend)</p> <ul style="list-style-type: none"> investigate the extent of natural and managed living resources in agricultural, horticultural, forest and grassland environments; and identify examples of local and global change (e.g., describe changes in the size of forested areas; describe changes in the characteristics of forested areas) investigate practical problems and issues in maintaining productive plants within sustainable environments, and identify questions for further study (e.g., investigate the long-term effects of irrigation practices or fertilizer use) 	N/A
S5	N/A	N/A
M1	<p>2. Investigate life processes and structures of plants, and interpret related characteristics and needs of plants in a local environment</p> <ul style="list-style-type: none"> investigate and interpret variations in plant structure, and relate these to different ways that plants are adapted to their environment (e.g., distinguish between plants with shallow spreading roots and those with deep taproots; describe and interpret differences in flower form and in the timing of flower production) 	<p>Number</p> <p>2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4]</p> <p>7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]</p> <p>8. Demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors). [C, CN, ME, PS, R, V]</p> <p>Statistics and Probability (Data Analysis)</p> <p>1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> determining the measures of central tendency (mean, median, mode) and range

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ALBERTA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M2	N/A	<p>Statistics and Probability (Data Analysis)</p> <p>1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> determining the measures of central tendency (mean, median, mode) and range
M3	<p>Analyzing and Interpreting</p> <p>Analyze qualitative and quantitative data, and develop and assess possible explanations</p> <p>Compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs</p> <p>Communication and Teamwork</p> <p>Communicate questions, ideas, intentions, plans and results, using [lists, notes in point form, sentences, data tables,] graphs, [drawings], oral language and other means</p> <p>Plants for Food and Fibre</p> <ul style="list-style-type: none"> investigate and interpret variations in plant structure, and relate these to different ways that plants are adapted to their environment (e.g., distinguish between plants with shallow spreading roots and those with deep taproots; describe and interpret differences in flower form and in the timing of flower production) 	N/A
M4	N/A	<p>Shape and Space</p> <p>3. Perform geometric constructions, including:</p> <ul style="list-style-type: none"> perpendicular line segments parallel line segments perpendicular bisectors angle bisectors. <p>[CN, R, V]</p>
So1	Analyze qualitative and quantitative data, and develop and assess possible explanations	Refer to M4
So2	<p>Plants for Food and Fibre: STS and Knowledge</p> <ul style="list-style-type: none"> describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend) <p>Mutual Respect</p> <p>Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds</p>	N/A
So3	Refer to S3	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

ALBERTA (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
L1	<p>Analyzing and Interpreting</p> <p>Compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs</p> <p>Communication and Teamwork Communicate questions, ideas, intentions, plans and results, using [lists, notes in point form, sentences, data tables,] graphs, [drawings], oral language and other means</p> <p>Plants for Food and Fibre: STS and Knowledge</p> <ul style="list-style-type: none"> describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend) <p>Performing and Recording</p> <ul style="list-style-type: none"> observe and record data, [and create simple line drawings] <p>Mutual Respect Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds</p>	N/A
L2	<p>Performing and Recording</p> <ul style="list-style-type: none"> observe and record data, [and create simple line drawings] 	N/A

Mathematics Kindergarten to Grade 9 Program of Studies (2007) <http://education.alberta.ca/teachers/program/math/programs.aspx>

Elementary Science. 1996 <http://education.alberta.ca/teachers/program/science/programs.aspx>

Junior High Science 7–8–9. 2003 <http://education.alberta.ca/teachers/program/science/programs.aspx>

ALBERTA (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	N/A	N/A
K4	N/A	<p>Statistics and Probability (Data Analysis) General Outcome Collect, display and analyze data to solve problems.</p>
K5	N/A	N/A
K6	N/A	<p>Statistics and Probability (Data Analysis) General Outcome Collect, display and analyze data to solve problems.</p>
Other Activity		
S1	N/A	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

ALBERTA (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S2	N/A	Number 2. Demonstrate an understanding of the addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] [ICT: P2–3.4] 7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	Number 2. Demonstrate an understanding of the addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] [ICT: P2–3.4] 7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]
M2	N/A	N/A
M3	Communication and Teamwork Communicate questions, ideas, intentions, plans and results, using [lists, notes in point form, sentences, data tables,] graphs, [drawings], oral language and other means	N/A
M4	N/A	N/A
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	N/A
L2	N/A	N/A

Mathematics Kindergarten to Grade 9 Program of Studies (2007) <http://education.alberta.ca/teachers/program/math/programs.aspx>

Elementary Science. 1996 <http://education.alberta.ca/teachers/program/science/programs.aspx>

Junior High Science 7–8–9. 2003 <http://education.alberta.ca/teachers/program/science/programs.aspx>

BRITISH COLUMBIA / YUKON (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	Life Science: Diversity of Life analyse how different organisms adapt to their environments	Statistics and Probability: Data Analysis D2 select, justify, and use appropriate methods of collecting data, including questionnaires experiments databases electronic media [C, PS, T]
K3	N/A	N/A
K4	N/A	Statistics and Probability: Data Analysis D3 graph collected data and analyze the graph to solve problems [C, CN, PS]
K5	N/A	N/A
K6	Life Science: Diversity of Life analyse how different organisms adapt to their environments N/A	N/A
Other Activity		
S1	Life Science: Diversity of Life analyse how different organisms adapt to their environments	N/A
S2	N/A	Number A7 demonstrate an understanding of integers, concretely, pictorially, and symbolically [C, CN, R, V] A8 demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors) [C, CN, ME, PS, R, V]
S3	N/A	N/A
S4	Life Science: Diversity of Life analyse how different organisms adapt to their environments	N/A
S5	Life Science: Diversity of Life analyse how different organisms adapt to their environments	Statistics and Probability: Data Analysis D2 select, justify, and use appropriate methods of collecting data, including questionnaires experiments databases electronic media [C, PS, T]
M1	N/A	Number A7 demonstrate an understanding of integers, concretely, pictorially, and symbolically [C, CN, R, V] A8 demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors) [C, CN, ME, PS, R, V]
M2	N/A	N/A
M3	N/A	Patterns and Relations B2 represent and describe patterns and relationships using graphs and tables [C, CN, ME, PS, R, V] Statistics and Probability (Data Analysis) D1 create, label, and interpret line graphs to draw conclusions [C, CN, PS, R, V] D3 graph collected data and analyze the graph to solve problems [C, CN, PS]

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

BRITISH COLUMBIA / YUKON (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M4	N/A	N/A
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	<p>Patterns and Relations B2 represent and describe patterns and relationships using graphs and tables [C, CN, ME, PS, R, V]</p> <p>Statistics and Probability (Data Analysis) D1 create, label, and interpret line graphs to draw conclusions [C, CN, PS, R, V]</p>
L2	N/A	N/A

Mathematics K to 7 (2007) - Mathematics Integrated Resource Packages www.bced.gov.bc.ca/irp/irp_math.htm

Sciences Integrated Resource Packages Science K to 7 (2005) www.bced.gov.bc.ca/irp/irp_sci.htm

Sciences Integrated Resource Packages Science 8 (2006) www.bced.gov.bc.ca/irp/irp_sci.htm

BRITISH COLUMBIA / YUKON (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	Life Science: Ecosystems Analyze the roles of organisms as part of interconnected food webs, communities and ecosystems	N/A
K4	N/A	N/A
K5	N/A	N/A
K6	N/A	N/A
Other Activity		
S1	Life Science: Ecosystems Assess survival needs and interactions between organisms and the environment Assess the requirements for sustaining healthy local ecosystems	N/A
S2	N/A	<p>Number A2 demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected) to solve problems [ME, PS, T]</p> <p>A6 demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically [C, CN, PS, R, V]</p> <p>Statistics and Probability (Data Analysis) D1 demonstrate an understanding of central tendency and range by determining the measures of central tendency (mean, median, mode) and range</p>

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

BRITISH COLUMBIA / YUKON (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S3	N/A	N/A
S4	Life Science: Ecosystems evaluate human impacts on local ecosystems	N/A
S5	Life Science: Ecosystems Assess survival needs and interactions between organisms and the environment Assess the requirements for sustaining healthy local ecosystems	N/A
M1	N/A	Number A2 demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected) to solve problems [ME, PS, T] A6 demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically [C, CN, PS, R, V] Statistics and Probability (Data Analysis) D1 demonstrate an understanding of central tendency and range by determining the measures of central tendency (mean, median, mode) and range
M2	N/A	Statistics and Probability (Data Analysis) D1 demonstrate an understanding of central tendency and range by determining the measures of central tendency (mean, median, mode) and range
M3	N/A	N/A
M4	N/A	3-D Objects and 2-D Shapes C3 perform geometric constructions, including parallel line segments
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	N/A
L2	N/A	N/A

Mathematics K to 7 (2007) - Mathematics Integrated Resource Packages www.bced.gov.bc.ca/irp/irp_math.htm

BRITISH COLUMBIA / YUKON (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	N/A	N/A
K4	N/A	N/A
K5	Processes of Science A8 demonstrate competence in the use of technologies specific to investigative procedures and research	N/A
K6	N/A	N/A

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

BRITISH COLUMBIA / YUKON (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
Other Activity		
S1	N/A	N/A
S2	Processes of Science A8 demonstrate competence in the use of technologies specific to investigative procedures and research	A7 demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically [C, CN, PS, R, V]
S3	N/A	N/A
S4	Processes of Science A3 represent and interpret information in graphic form	N/A
S5	Processes of Science A3 represent and interpret information in graphic form A8 demonstrate competence in the use of technologies specific to investigative procedures and research	N/A
M1	N/A	A7 demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically [C, CN, PS, R, V]
M2	N/A	N/A
M3	Processes of Science A3 represent and interpret information in graphic form A8 demonstrate competence in the use of technologies specific to investigative procedures and research	N/A
M4	A8 demonstrate competence in the use of technologies specific to investigative procedures and research	N/A
So1	N/A	Refer to M4
So2	N/A	N/A
So3	A8 demonstrate competence in the use of technologies specific to investigative procedures and research Refer to S3	N/A
L1	Processes of Science A3 represent and interpret information in graphic form	N/A
L2	N/A	N/A

Mathematics 8 and 9 (2008) - Mathematics Integrated Resource Packages www.bced.gov.bc.ca/irp/irp_math.htm

NORTHWEST TERRITORIES / NUNAVUT (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	Diversity of Living Things Compile data gathered through investigation in order to record and present results, using charts, tables and labeled graphs produced by hand or with a computer (e.g., make an inventory of animals found in a specific location)	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

NORTHWEST TERRITORIES / NUNAVUT (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
K4	Diversity of Living Things Compile data gathered through investigation in order to record and present results, using charts, tables and labeled graphs produced by hand or with a computer (e.g., make an inventory of animals found in a specific location)	Graph collected data and analyze the graph to solve problems. [C, CN, PS]
K5	Diversity of Living Things Communicate the procedures and results of investigations for specific purposes and to specific audiences, using electronic media, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., create a clearly labeled chart of organisms observed and identified during a pond study).	Statistics and Probability: Data Analysis Select, justify and use appropriate methods of collecting data, including: <ul style="list-style-type: none"> • questionnaires • experiments • databases • electronic media. [C, PS, T]
K6	N/A	N/A
Other Activity		
S1	Diversity of Living Things Communicate the procedures and results of investigations for specific purposes and to specific audiences, using electronic media, oral presentations, written notes and descriptions, charts, graphs, and drawings (e.g., create a clearly labeled chart of organisms observed and identified during a pond study)	N/A
S2	N/A	Number 2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4] 7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]
S3	N/A	N/A
S4	N/A	N/A
S5	Diversity of Living Things Compile data gathered through investigation in order to record and present results, using charts, tables and labeled graphs produced by hand or with a computer (e.g., make an inventory of animals found in a specific location)	Statistics and Probability: Data Analysis Select, justify and use appropriate methods of collecting data, including: <ul style="list-style-type: none"> • questionnaires • experiments • databases • electronic media. [C, PS, T]
M1	N/A	Number 2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4] 7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]
M2	N/A	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

NORTHWEST TERRITORIES / NUNAVUT (GRADE 6) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
M3	N/A	<p>Patterns and Relations</p> <p>1. Represent and describe patterns and relationships, using graphs and tables. [C, CN, ME, PS, R, V] [ICT: C6–2.3]</p> <p>Statistics and Probability</p> <p>1. Create, label and interpret line graphs to draw conclusions. [C, CN, PS, R, V]</p> <p>3. Graph collected data, and analyze the graph to solve problems. [C, CN, PS, R, T] [ICT: C6–2.5, C7–2.1, P2–2.1, P2–2.2]</p> <p>7. Read and interpret graphs that are provided. [C, E, PS, R]</p>
M4	N/A	N/A
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	<p>Patterns and Relations</p> <p>1. Represent and describe patterns and relationships, using graphs and tables. [C, CN, ME, PS, R, V] [ICT: C6–2.3]</p> <p>Statistics and Probability</p> <p>7. Read and interpret graphs that are provided. [C, E, PS, R]</p>
L2	N/A	N/A

The Northwest Territories and Nunavut use the Western Canadian Protocol (WCP) Mathematics, Kindergarten to Grade 12 - Lead: Alberta: The Common Curriculum Framework for K–9 Mathematics, May 2006 www.wncp.ca/english/subjectarea/mathematics/ccf.aspx

NORTHWEST TERRITORIES / NUNAVUT (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	<p>Interactions and Ecosystems, STSE</p> <p>investigate and interpret evidence of interaction and change (e.g., population fluctuations, changes in weather, availability of food or introduction of new species into an ecosystem)</p> <p>Skills Outcome: state a prediction and a hypothesis based on back ground information or an observed pattern of events</p>	N/A
K3	<p>Interactions and Ecosystems, STSE</p> <p>investigate a variety of habitats, and describe and interpret distribution patterns of living things found in those habitats (e.g., describe and compare two areas within the school grounds—a relatively undisturbed site and a site that has been affected by heavy use; describe and compare a wetland and a dry land area in a local parkland)</p>	N/A

APPENDICES

LEGEND: K - Key activity SUBJECT-SPECIFIC ACTIVITIES: S - Science M - Math So - Social Studies L - Language Arts

NORTHWEST TERRITORIES / NUNAVUT (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
K4	Interactions and Ecosystems Analyzing and Interpreting compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs (e.g., illustrate a food web, based on observations made within a given environment)	N/A
K5	Interactions and Ecosystems, Performing and Recording use tools and apparatus effectively and accurately for collecting data (e.g., measure factors, such as temperature, moisture, light, shelter and potential sources of food, that might affect the survival and distribution of different organisms within a local environment)	N/A
K6	Interactions and Ecosystems, Analyzing and Interpreting identify strengths and weaknesses of different methods of collecting and displaying data (e.g., compare two different approaches to measuring the amount of moisture in an environment; analyze information presented by proponents on two sides of an environmental issue)	N/A
Other Activity		
S1	Interactions and Ecosystems, STSE investigate and interpret evidence of interaction and change (e.g., population fluctuations, changes in weather, availability of food or introduction of new species into an ecosystem)	N/A
S2	Performing and Recording: use tools and apparatus effectively and accurately for collecting data (e.g., measure factors, such as temperature, moisture, light, shelter and potential sources of food, that might affect the survival and distribution of different organisms within a local environment)	Number 2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4] 7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V] 8. Demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors). [C, CN, ME, PS, R, V] Statistics and Probability (Data Analysis) 1. Demonstrate an understanding of central tendency and range by: • determining the measures of central tendency (mean, median, mode) and range
S3	N/A	N/A
S4	Interactions and Ecosystems, STSE describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend) • investigate the extent of natural and managed living resources in agricultural, horticultural, forest and grassland environments; and identify examples of local and global change (e.g., describe changes in the size of forested areas; describe changes in the characteristics of forested areas) • investigate practical problems and issues in maintaining productive plants within sustainable environments, and identify questions for further study (e.g., investigate the long-term effects of irrigation practices or fertilizer use)	N/A

APPENDICES

LEGEND: **K** - Key activity **SUBJECT-SPECIFIC ACTIVITIES:** **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

NORTHWEST TERRITORIES / NUNAVUT (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
S5	N/A	N/A
M1	<p>2. Investigate life processes and structures of plants, and interpret related characteristics and needs of plants in a local environment</p> <ul style="list-style-type: none"> investigate and interpret variations in plant structure, and relate these to different ways that plants are adapted to their environment (e.g., distinguish between plants with shallow spreading roots and those with deep taproots; describe and interpret differences in flower form and in the timing of flower production) 	<p>Number</p> <p>2. Solve problems involving whole numbers and decimal numbers. [ME, PS, T] [ICT: C6–2.4]</p> <p>7. Demonstrate an understanding of integers, concretely, pictorially and symbolically. [C, CN, R, V]</p> <p>8. Demonstrate an understanding of multiplication and division of decimals (1-digit whole number multipliers and 1-digit natural number divisors). [C, CN, ME, PS, R, V]</p> <p>Statistics and Probability (Data Analysis)</p> <p>1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> determining the measures of central tendency (mean, median, mode) and range
M2	N/A	<p>Statistics and Probability (Data Analysis)</p> <p>1. Demonstrate an understanding of central tendency and range by:</p> <ul style="list-style-type: none"> determining the measures of central tendency (mean, median, mode) and range
M3	<p>Analyzing and Interpreting</p> <p>Analyze qualitative and quantitative data, and develop and assess possible explanations</p> <p>Compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs</p> <p>Communication and Teamwork</p> <p>Communicate questions, ideas, intentions, plans and results, using [lists, notes in point form, sentences, data tables,] graphs, [drawings], oral language and other means</p> <p>Plants for Food and Fibre</p> <ul style="list-style-type: none"> investigate and interpret variations in plant structure, and relate these to different ways that plants are adapted to their environment (e.g., distinguish between plants with shallow spreading roots and those with deep taproots; describe and interpret differences in flower form and in the timing of flower production) 	N/A
M4	N/A	<p>Shape and Space</p> <p>3. Perform geometric constructions, including:</p> <ul style="list-style-type: none"> perpendicular line segments parallel line segments perpendicular bisectors angle bisectors. <p>[CN, R, V]</p>
So1	Analyze qualitative and quantitative data, and develop and assess possible explanations	Refer to M4

APPENDICES

LEGEND: **K** - Key activity SUBJECT-SPECIFIC ACTIVITIES: **S** - Science **M** - Math **So** - Social Studies **L** - Language Arts

NORTHWEST TERRITORIES / NUNAVUT (GRADE 7) PROVINCIAL CURRICULUM OUTCOMES...CONTINUED

Activity	Science	Mathematics
So2	<p>Plants for Food and Fibre: STS and Knowledge</p> <ul style="list-style-type: none"> describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend) <p>Mutual Respect Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds</p>	N/A
So3	Refer to S3	N/A
L1	<p>Analyzing and Interpreting</p> <p>Compile and display data, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, bar graphs and line graphs</p> <p>Communication and Teamwork Communicate questions, ideas, intentions, plans and results, using [lists, notes in point form, sentences, data tables,] graphs, [drawings], oral language and other means</p> <p>Plants for Food and Fibre: STS and Knowledge</p> <ul style="list-style-type: none"> describe human uses of plants as sources of food and raw materials, and give examples of other uses (e.g., identify uses of plants as herbs or medicines; describe plant products, and identify plant sources on which they depend) <p>Performing and Recording</p> <ul style="list-style-type: none"> observe and record data, [and create simple line drawings] <p>Mutual Respect Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds</p>	N/A
L2	<p>Performing and Recording</p> <ul style="list-style-type: none"> observe and record data, [and create simple line drawings] 	N/A

The Northwest Territories and Nunavut use the Western Canadian Protocol (WCP) Mathematics, Kindergarten to Grade 12 - Lead: Alberta: The Common Curriculum Framework for K–9 Mathematics, May 2006 www.wncp.ca/english/subjectarea/mathematics/ccf.aspx
 Alberta Junior High Science 7–8–9. 2003 <http://education.alberta.ca/teachers/program/science/programs.aspx>

NORTHWEST TERRITORIES / NUNAVUT (GRADE 8) PROVINCIAL CURRICULUM OUTCOMES

Activity	Science	Mathematics
Key Activity		
K1	N/A	N/A
K2	N/A	N/A
K3	N/A	N/A
K4	N/A	N/A
K5	N/A	N/A
K6	N/A	N/A
Other Activity		
S1	N/A	N/A
S2	N/A	Number 2. Demonstrate an understanding of the addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] [ICT: P2–3.4] 7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]
S3	N/A	N/A
S4	N/A	N/A
S5	N/A	N/A
M1	N/A	Number 2. Demonstrate an understanding of the addition, subtraction, multiplication and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T] [ICT: P2–3.4] 7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]
M2	N/A	N/A
M3	Communication and Teamwork Communicate questions, ideas, intentions, plans and results, using [lists, notes in point form, sentences, data tables,] graphs, [drawings], oral language and other means	N/A
M4	N/A	N/A
So1	N/A	Refer to M4
So2	N/A	N/A
So3	Refer to S3	N/A
L1	N/A	N/A
L2	N/A	N/A

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