SCIENCE PROGRAMS
OF THE
PROVINCES OF CANADA
ELEMENTARY GRADES
(Abbreviated Form)

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FOREWORD

The Elementary Science Programs used in the provinces of Canada have been reproduced here in abbreviated form for use in teachers' workshops and curriculum committees. It is intended that this will serve as a ready reference for teachers and others working on the development and revision of the Science Programs for the schools in the Northwest Territories and Northern Quebec.

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C O N T E N T S

BRITISH COLUMBIA

SCIENCE

THE FIRST YEAR

UNIT I. THE AUTUMN SEASON

Major Concept

Autumn is a time of change and preparation for winter.

Core Content

A. The appearance of the landscape changes as winter approaches.
   (1) The leaves change colour.
   (2) Many trees and shrubs become bare.
B. The weather becomes more changeable.
   (1) Storms are more frequent.
   (2) Frost comes.
C. The length of day and night changes.
   (1) The days are shorter.
   (2) The nights are longer.
D. Most living things prepare for winter.
   (1) Man prepares for winter.
      (a) Crops are harvested and stored.
      (b) Fuel is bought and stored.
      (c) Homes are made winter-proof.
      (d) Warm clothing is purchased.
   (2) Plants prepare for winter.
      (a) Seeds ripen and scatter.
      (b) Many plants die (annuals).
      (c) Many plants become dormant (perennials).
   (3) Birds and other animals prepare for winter.
      (a) Some animals store food (squirrel).
      (b) Some animals store food as body fat (bear).
      (c) Some animals grow thicker coats and (or) change colour (snowshoe rabbit).
      (d) Some birds migrate. (A few common birds should be recognized by name and appearance noted).

UNIT II. PLANTS

Major Concept

Plants are living things.

Core Content

A. Plants grow to be various sizes and shapes.
   (1) Plants vary in size.
   (2) Plants vary in shape.
   (3) Plants vary in types of leaves, flowers and fruit.

B. Plants grow in many places.
   (1) Some plants grow in woods and fields.
   (2) Some plants grow in gardens.
   (3) Some plants grow in water.
   (4) Some plants grow in dry places.
   (5) Some plants grow in high places.
C. Plants have different parts (roots, stems, leaves).
D. Many plants grow from seeds.
   (1) A seed is a new plant and contains its own food-supply.
   (2) Most plants produce flowers and seeds.
   (3) Seeds vary in size and shape.
E. Plants have many requirements.
   (1) Seeds need moisture, air, and warmth to germinate and begin growth.
   (2) Plants need moisture, air, food from the soil, warmth and sunlight to continue growth.
   (3) Cultivated plants need protection from harmful insects and animals.
   (4) Wild plants need to be conserved.

UNIT III. CARE OF PETS

Major Concept

Pets are dependent upon people for proper food and care.

Core Content

A. Pets should be properly housed. Animals need to be protected from the weather in clean, comfortable shelters.
B. Suitable food should be provided for pets.
   (1) Pets must be adequately fed at regular times.
   (2) Fresh water must be given daily.
C. Cleanliness is necessary to the well-being of pets.
   (1) Feeding-dishes should be washed regularly.
   (2) Animals' bodies must be kept free of vermin.
   (3) Diseased animals should have correct care (veterinarians, animal hospitals).
D. Pets should be treated kindly.
   (1) Young animals should not be handled excessively.
   (2) Pets need fresh air and exercise.
   (3) Pets should not be disturbed when eating or sleeping.

UNIT IV. ANIMAL HOMES

Major Concept

There is a great variety of animal homes in the child's environment.

Core Content

A. Homes provide shelter and protection.
   (1) Most animals use their homes while caring for their young. (some kinds of animals grow and develop without parental care, e.g., turtles, insects, frogs).
   (2) Many animal homes provide protection from enemies.
   (3) Many homes provide animals with protection from the weather.

B. Animals make homes in many places.
   (1) Many animals make homes in trees (squirrels)
   (2) Some animals make homes on or under the ground (mole, rabbit, gopher).
   (3) Many animals make homes in or on the water (beaver).
C. Many materials are used in making animal homes.
   (1) Some animals make homes of materials found in their environment (robins, rabbits, squirrels, beaver, mice).
   (2) Some animals make the materials they use for their homes (paper-wasps, garden spider, honey-bees).

UNIT V. MAGNETS

Major Concept

Magnets attract some things.

Core Content

A. Magnets attract some things. Magnets attract iron, nickel, steel objects such as nails, pins, some spoons, scissors.
B. Magnets do not attract some materials, such as paper, glass, wood, cloth, rubber, leather.

UNIT VI. WATER

Major Concept

Water is a solvent.

Core Content

A. Some materials will dissolve in water.
   (1) Sugar will dissolve.
   (2) Salt will dissolve.
B. Some materials will not dissolve in water.
   (1) Rocks will not dissolve.
   (2) Wood will not dissolve.
   (3) Cloth will not dissolve.
C. The appearance of the solution is often unchanged when the taste is changed.
   (1) Salt dissolved in water changes the taste without changing the appearance of water.
   (2) Sugar dissolved in water changes the taste without changing the appearance of water.

UNIT VII. AIR

Major Concept

Air surrounds us and occupies space.

Core Content

A. Air surrounds us.
   (1) Moving air can be felt.
   (2) Air is invisible.
B. Air occupies space. (Spaces that appear empty to the children are filled with air, e.g., the room, an "empty" box or jar).
C. Air has movement.
   (1) Wind is moving air.
   (2) The effects of moving air can be observed (clothes blowing, smoke, leaves).
D. Air has uses.
   (1) All animals breathe air.
   (2) Air is used in balls, ballons, tires.

UNIT VIII. THE SKY

Major Concept

The appearance of the sky is constantly changing.

Core Content

A. The daytime sky changes.
   (1) The sky varies in colour.
      (a) Clear skies are blue.
      (b) Cloudy skies are grey.
      (c) Sunrise, sunset and rainbows colour the sky.
   (2) The sun gives us light.
      (a) The sun is shining all the time.
      (b) Clouds hide the sun at times.
   (3) Both moon and sun are visible at times.
   (4) The position of the sun changes.
B. The night sky changes.
   (1) The night sky is darker than the daytime sky.
   (2) The moon and stars can be seen at night. At times the clouds may hide them.
   (3) The position and shape of the moon changes. (Avoid technical terms. Phases of the moon will be taken in Grade V).

UNIT IX. LAND FEATURES

Major Concept

Earth features vary from place to place.

Core Content

A. There are hills and mountains in some places.
   (1) Hills vary in shape and size.
   (2) Large hills are called mountains.
   (3) Hills and mountains are made of soil and rocks.
   (4) Rocks vary in size, shape, colour and hardness. (Massive outcroppings, boulders, pebbles, sand).
   (5) Valleys are formed between hills.
B. There are bodies of water in some places.
   (1) Sizes and shapes of bodies of water are varied.
   (2) Rivers, streams, lakes, and oceans have certain characteristics, such as fresh or salt water, currents, tides.

UNIT X. THE SOIL

Major Concept

Soil is one of our greatest resources.

Core Content

A. Food comes directly or indirectly from the soil.
   (1) Vegetables and fruit grow in soil.
   (2) Meat, milk, eggs come from animals that feed on plants.
B. Many clothing materials come directly or indirectly from the soil.
   (1) Some material is made from plants (cotton, linen, rayon).
   (2) Some material is made from animals (wool, leather).
C. Soil is made of many things.
   (1) Decayed plant and animal matter is found in soil.
   (2) Rock particles are part of the soil.
D. Soil needs proper care. Good soil can be maintained by:
   (1) Using fertilizer (barnyard manure, compost, and commercial fertilizers.
   (2) Plants and rocks help hold the soil.
      (a) Water may wash away soil. Wind may blow away soil.
      (b) Plants can be used as a protective cover to prevent erosion of soil.
      (c) Rocks and stones tend to hold soil in place. They can also be used for walls and dams to prevent soil from eroding.

THE SECOND YEAR

UNIT I. SUMMER

Major Concept

In summer there are many plants and animals about and, regardless of habitat, plants and animals need water in order to sustain life.

Core Content

A. People change activities in summer.
   (1) Reason for changes.
      (a) Longer hours of daylight.
      (b) Higher temperatures.
   (2) Activities.
      (a) Longer hours to play out of doors.
      (b) Few clothes required in summer - freer action.
      (c) More pleasant temperatures.

B. There are many plants in summer.
   (1) Plants grow in many places.
      (a) Near water.
      (b) In water - water-lilies.
      (c) In dry places - cacti.
      (d) In fields.
   (2) Plants need water for growth (some more than others).
      (a) Rainfall, irrigation (ditches in fields).
      (b) Special adaptations of plants to secure and (or) retain water in dry places.
         (i) Long roots.
         (ii) Fleshy stems and roots.
         (iii) Small leaves.
   (3) Plants are usually green in summer and usually produce flowers.

C. There are many animals about in summer.
   (1) Abundance of food.
      (a) Fruits.
      (b) Berries.
      (c) Roots.
      (d) Leaves.
   (2) Storage of food.
      (a) Squirrels and chipmunks store food.
      (b) Bears eat in abundance and store food in the form of fat.

UNIT II. AUTUMN

Major Concept

Changes take place in the lives of plants and animals in the autumn.

Core Content

A. Changes take place in plant life.
   (1) Some leaves change colour and later fall. (Fallen leaves help the soil).
   (2) Buds are on many trees and shrubs.
   (3) Many short-lived plants produce seeds.
      (a) Seeds are scattered and grow far away from the parent plant - more space and light.
      (b) Seeds are moved about in many ways (seed dispersal).
         (i) Wind - dandelion, thistle, maple, etc.
         (ii) Water - all types.
         (iii) People and animals - burrs.
   (4) Flowers are less profuse than in summer or are not seen at all.
B. Changes take place in insect life.
   (1) Some insects make covers for themselves.
      (a) Moth caterpillar - cocoon.
      (b) Butterfly caterpillar - chrysalis.
   (2) Some lay eggs and die. The eggs will hatch in the spring - grasshopper.
C. Changes take place in bird life.
   (1) Birds are more quiet than in spring and early summer.
   (2) Birds moult and then grow new feathers.
   (3) Some birds migrate to a warmer climate.
      (a) Hummingbird.
      (b) Canada Goose,
      (c) Bluebird.
      (d) Swallow.
D. Changes take place in animal life.
   (1) Many animals are eating to grow fat (bear).
   (2) Many are storing food (squirrel).
   (3) Many are growing thicker hair (rabbit).
   (4) Some are changing colour (rabbit, weasel) - for what purpose?
   (5) Many are finding winter homes (bears, skunks, woodchucks).

UNIT III. AIR, WATER, WEATHER

Major Concept

Air is all around us and contains many foreign particles and water. Changes in the air make changes in the weather.

Core Content

A. Air surrounds us and fills every space.
   (1) Air is touching the ground.
   (2) Air reaches high above the ground and clouds.
   (3) Air is all around the earth.
B. Air contains many foreign particles.
   (1) Dust is in the air.
   (2) Smoke is in the air.

C. Air contains water.
   (1) Water goes into the air - evaporation.
   (2) Water returns from the air - condensation.
      (a) Clouds, fog.
      (b) Rain, snow, hail, sleet.
      (c) Frost, dew.
D. Changes in the air make changes in the weather.
   (1) Sometimes there is more water than the air can hold.
   (2) When air is cooled, water comes out in some form.

UNIT IV. OUR EARTH

Major Concept

The earth is a large round ball moving all the time. The movement helps to cause day and night.

Core Content

A. The earth is large.
   (1) The earth is large as compared with a familiar neighbourhood.
   (2) There are many farms and cities on the earth.
   (3) Ground and ocean make up the earth.
   (4) Clouds and air belong to the earth.
B. The earth is round.
   (1) It is like a very big ball.
   (2) Ships and aeroplanes travel around it.
C. The earth moves all the time.
   (1) The movement takes place day and night.
   (2) The movement is faster than ships and trains.
   (3) The movement is smooth and regular.
D. Movement of the earth causes day and night.
   (1) Shadows are made when sunlight does not pass through objects.
   (2) The sun shines all the time.
      (a) Daytime - we are on the sunny side of the earth.
      (b) Night-time - we are on the shaded side of the earth.

UNIT V. WINTER

Major Concept

Further changes take place in the lives of plants and animals in winter.

Core Content

A. Winter days are shorter and the nights are longer.
B. Activities of animals in winter.
   (1) Some animals are about all winter.
      (a) Some animals change colour.
      (b) Some animals grow thicker hair.
      (c) These animals hunt for food.

(2) Some animals hibernate all winter.
(a) Some of these animals have fat stored on their bodies.
(b) Some animals "sleep" in the mud in the bottom of streams and lakes and the banks of rivers (frogs, turtles).
(c) Some of these animals sleep under the frozen ground.
(3) Some animals hibernate for part of the winter.
(a) Some of these animals find a place to stay on cold days.
(b) Some of these animals come out to search for food on sunny days.
(c) Some of these animals get their energy from stored fat on their bodies.
(d) Some of these store food in their homes.
(4) Some birds and animals migrate to warmer climates.
(a) Food is more abundant.
(b) The weather is warmer.
(c) They travel long distances.

C. Activites of plants in winter.
(1) Some plants live through the winter.
(a) The roots of grass live through the winter.
(b) Trees live through the winter.
(i) Lose leaves.
(ii) Grow buds before winter comes.
(iii) Evergreens stay green all winter - they lose a few leaves at a time all through the year.
(2) Some plants die but leave seeds dormant in the ground.

D. In some places it is warm all the time.
(1) Plants grow and have flowers.
(2) Birds migrate to some of these places.

UNIT VI. SOUNDS

Major Concept

Sounds are caused by vibrations.

Core Content

A. Sounds come to our ears through the air.
(1) Sounds are caused by vibrations.
(2) Sounds can be soft, loud, high, low.
(3) Sounds can travel many miles through the air.

B. Sounds travel through other materials.
(1) Sounds travel in all directions.
(2) Sounds go through other materials - solids, liquids.

C. Some sounds are useful.
(1) Danger signals save lives.
(2) Door bells and telephone bells summon attention.

D. Sounds are pleasant or unpleasant.
(1) Music is pleasant.
(2) Noise is unpleasant.

UNIT VII. SPRING

Major Concept

Changes take place in the lives of plants and animals in the spring.

Core Content

A. Spring days are longer and warmer.
B. Changes take place in bird life.
   (1) Birds are noisy.
   (2) Migrating birds return.
      (a) Some stay until fall.
      (b) Some stop for food and continue their journey.
   (3) Many birds build nests to lay eggs and raise their young.
      (a) Variety in nest construction.
         (i) Grass, twigs, mud - robin.
         (ii) Holes in trees - woodpecker.
         (iii) Mud - swallow.
      (b) Nest situations (close to the source of food).
         (i) Forks of tree branches.
         (ii) Ground.
         (iii) Reeds or rushes.
         (iv) Trees.
         (v) Buildings.
C. Changes take place in animal life.
   (1) Hibernating animals are searching for food.
      (a) They are thin.
      (b) They are dangerous.
      (c) Young were born while the mother was in hibernation - skunk, bear.
   (2) Turtles, snakes, frogs, etc., reappear.
   (3) Animals live in places suitable to their mode of life.
D. Changes take place in insect life.
   (1) Butterflies emerge from chrysalis.
   (2) Moths emerge from cocoons.
E. Changes take place in plant life.
   (1) Buds.
      (a) Leaf buds on trees open into leaves.
      (b) Flower buds open.
   (2) Seeds.
      (a) Some seeds are planted in gardens.
      (b) Seeds dispersed in the fall begin to grow.
   (3) Bulbs.
      (a) Garden bulbs are usually planted in the fall.
      (b) First spring flowers develop from bulbs.
   (4) Grass.
      (a) Begins to grow.
      (b) Becomes green.
      (c) Keeps soil from washing away.

UNIT VIII. CARE OF THE FARM

Major Concept

The farm is a resource which requires careful management and maintenance.

Core Content

A. Soil should be conserved.
   (1) Soil needs care (drainage, fertilizer, irrigation).
   (2) Plants help to hold the soil (grass, trees).
B. Farm animals need care (good food, water, rest, proper shelter).
C. Farm machinery and garden tools should have proper care (keep dry, oiled, painted).
D. Woods may be an important part of the farm.
   (1) Woods prevent erosion.
   (2) Woods are homes for wild animals.
   (3) Trees grow into timber.

THE THIRD YEAR

UNIT I. HOW ANIMALS ARE DIFFERENT FROM EACH OTHER

Major Concept

There are many different kinds of animals.

Core Content

A. Animals vary in sizes, shapes and body coverings.
   (1) Animals are large, massive, small, short, tall.
   (2) Animals vary greatly in shape - from simple shape (worm, smake) to more complex shape (elephant, giraffe) to an unusual shape (sea-anemones, sand-dollars, sponges).
   (3) Some animals are covered with hair, fur or feathers.
   (4) Some animals are covered with scales or shells.
B. Animals may be seen in many places.
   (1) Many animals live in the water.
   (2) Many animals live in the forest.
   (3) Some animals live in the desert.
   (4) Many animals live in the jungle.
   (5) Many animals live in the ground.
   (6) Many animals live on plains or mountains.

UNIT II. HOW ANIMALS GET FOOD

Major Concept

Animals secure the food they need in a variety of ways.

Core Content

A. Animals secure food in different ways.
   (1) Domestic animals need not hunt food (cat, dog, horse, cow).
   (2) Wild animals must find food for themselves (deer, fox, wolf, squirrel, chipmunk, bear).
   (3) Some birds and insects secure food in flight (hawk, swallow, dragon-fly).
   (4) Some animals dive or swim for their food (duck, pelican, seal, fish, water-beetles).
   (5) Some animals secure their food by running (wolf, cougar, fox, coyote, weasel).
B. Not all animals eat the same kinds of food.
   (1) Some animals eat plants.
   (2) Some animals eat plants and animals.
   (3) Some animals eat other animals.

UNIT III. HOW ANIMALS ESCAPE FROM ENEMIES

Major Concept

Most animals have ways or means of protecting themselves from their enemies.

Core Content

A. Some animals escape by movement.
   (1) Running (deer).
   (2) Jumping or dodging (rabbit, toad, squirrel).
   (3) Flying (birds, insects).
   (4) Swimming and diving (frogs, beavers).
B. Some animals escape capture by means of their protective colouring (deer, rabbit).
C. Some animals are protected by their body coverings.
   (1) Shells (turtle, clam, snail)
   (2) Quills (porcupine).
D. Some animals protect themselves by feigning death or injury (opossum, grouse).
E. Some animals protect themselves by means of their unpleasant odour or taste, e.g., monarch butterfly (taste), skunk (odour).
F. Some animals possess defensive weapons.
   (1) Teeth (squirrel, mink).
   (2) Claws (cougar, racoon).
   (3) Antlers (deer, moose).
   (4) Hoofs (horse, cow).
   (5) Stingers (bee, wasp).

UNIT IV. CHANGES ALL ABOUT YOU

Major Concept

Changes are continually taking place about you - some rapidly, others slowly.

Core Content

A. Evaporating is a change.
B. Rusting is a change. Objects containing iron will rust when they become wet (nails, skates, tacks, bicycles).
C. Freezing and melting are changes.
   (1) Water is turned into ice; ice into water.
   (2) Changes may take place naturally.
   (3) Changes may take place mechanically (refrigeration or application of heat).
D. Burning with fire is a change.
   (1) Various materials may be used - paper, wood, coal.
   (2) Burning is rapid and causes changes in form and texture.
E. Decaying is a change.
   (1) Humus if formed from decayed vegetation and animal matter.
   (2) Humus helps make good soil for growth.
F. Dissolving is a change.
   (1) Some things dissolve in water (salt, sugar).
   (2) Some things do not dissolve in water (stones, marbles, wood).
G. Growing is a change.
   (1) People change as they grow.
   (2) Animals change as they grow.
   (3) Plants change as they grow.

UNIT V. MAGNETS

Major Concept

Magnets, often used as toys, have practical uses.

Core Content

A. Magnets attract iron and steel (nails, tacks, pins).
B. Magnets have different shapes (bar-magnet, U-magnet). The shape of a magnet does not alter the way it acts.
C. Iron and steel tools may be magnetized (magnetized scissors retrieve pins, tack hammers hold tacks, magnetized screwdrivers retrieve screws and small articles from inaccessible places).

UNIT VI. ELECTRICITY

Major Concept

Electricity is used by man to improve his way of living.

Core Content

A. Electricity is used in the home (lighting, heating, appliances, radio and television).
B. Safety measures should be practised in the home.
   (1) Be safe with electrical switches.
   (2) Turn off electric stoves and appliances when not in use.
   (3) Avoid dangerous conditions (bare wires, frayed cords, lamp cord under carpet).
C. Electricity has improved communication and transportation (telegraph, telephone, radio, trains, trolley-buses).

UNIT VII. THE AIR AROUND YOU

Major Concept

We live at the bottom of an ocean of air which surrounds the earth.

Core Content

A. The air is a part of the earth. Air surround the earth.
B. Air is in many places.
   (1) Air occupies spaces in all places on the earth which are not filled with something else.
   (2) It is found in the deepest wells and mines, in soil, sponges, water, rocks, etc.
C. Water goes into the air.
   (1) Water evaporates from oceans, rivers, ponds and lakes.
   (2) Water evaporates from leaves and stems of plants, soil, fields, and woods.
   (3) When water evaporates, it goes into the air.
D. Water comes from the air. When there is more water than the air can hold, water comes out of the air as snow, rain, fog, hail.

UNIT VIII. THE EARTH YOU LIVE ON

Major Concept

Regions of the earth vary greatly because of differences in land and water parts.

Core Content

A. The earth is big. The earth is so very large that only a small part can be seen at one time.
B. We travel on the big earth.
   (1) A globe is used to show that the earth is round.
   (2) A map is useful in helping children identify land and water parts.
   (3) A map is useful in helping children plan a trip.
C. Land parts of the earth's surface differ (mountains, deserts, islands, plains, forests).
D. Water parts of the earth's surface differ (lakes, streams, rivers, oceans, waterfalls, canyons, geysers).

UNIT IX. THE SKY ABOVE YOU

Major Concept

Many heavenly bodies can be seen from the earth.

Core Content

A. The sun is the largest and brightest object in the daytime sky. (Why does it look so small?).
   (1) Sun is too far away from earth for anyone to go there.
   (2) Sun is made of hot, glowing gases.
   (3) Light and heat from the sun are necessary for life.
B. The moon is the nearest heavenly body to the earth.
   (1) The moon is smaller than the earth or the sun.
   (2) The moon is solid like the earth and has rocks and mountains.
   (3) The moon gets light and heat from the sun as the earth does.
   (4) There is no great ocean of air around the moon, nor clouds, rain, lakes, rivers, plants, or animals on the moon.
   (5) Moonlight is never as bright as sunlight because it is light reflected from the sun.
C. There are countless stars in the sky.
   (1) Stars are suns, a great distance from the earth.
      (a) Some stars can be seen with the naked eye. (Why can they not be seen in the daytime?).
      (b) Some can be seen only with a telescope.
      (c) Some stars cannot be seen at all.
   (2) Some familiar stars and group stars are North Star, Giant Dipper, Little Dipper, Milky Way.
D. A number of planets can be seen in the sky. They are often confused with stars because of their apparent similarity.

UNIT X. USING WATER WISELY

Major Concept

Water is one of our most vital resources.

Core Content

A. Water is important to living things and should not be wasted or polluted. (What does "polluted" mean)?
   (1) People require water for drinking and cooking. (How much water do you use in a day?)
   (2) Animals require water in order to live.
   (3) Plants require water in order to grow.
   (4) Water should be conserved, and, for scenic as well as health reasons, should not be polluted with any type of waste.
B. Water for use is stored in different ways.
   (1) City water-supply is brought from lakes, rivers, and streams and stored in reservoirs and dams.
   (2) On ranches and farms, people get water from wells and springs. (What is the origin of our domestic water-supply?)
C. Water has uses other than for drinking.
   (1) Water is needed for irrigation and live stock.
   (2) Where there is insufficient water, it can be pumped from storage lakes.
   (3) Water has recreational and scenic value. Resorts are located near lakes, rivers, oceans, bays, waterfalls.

UNIT XI. HOW MAN HAS MADE HIS HOME MORE COMFORTABLE

Major Concept

Homes have improved from the primitive shelter to the modern structure as man has invented new tools and materials.

Core Content

A. Man has built many types of homes as he has progressed.
   (1) Cave.
   (2) Hut (mud, stone, sod, snow).
   (3) Tent (wigwam, tepee).
   (4) Log cabin
   (5) Modern home.
B. Homes in any country are built largely from materials found in that country.
   (1) Hot wet regions - houses are made of grass, bamboo, palm leaves, etc.
   (2) Hot,dry regions - many homes are made of adobe.
   (3) Temperate forested regions - houses are built mostly of wood.
   (4) Temperate unforested regions - houses are built largely of stone or brick.

C. Homes have improved and will continue to improve as new materials, tools and methods are devised.

(1) Factories and lumber-mills manufacture new products - plywood, wallboards, insulation, glass bricks, cement and ceramic products, etc.

(2) New tools and machines facilitate construction - power-saws, cement-mixers, spray-guns, bull-dozers, power-shovels.

(3) New methods are being devised - prefabricated houses, component parts, sink units, cupboards.

(4) Homes are more comfortable as a result of better construction, better materials, better heating units, air-conditioning, new labour-saving appliances, etc.

SCIENCE

ALBERTA

GRADE I

I. ANIMALS

A. Animals live in various environments
   1. Some animals live on land
   2. Some animals live in water
   3. Some animals live on land and can fly
   4. Some animals live both on land and in water

B. Most animals find or build homes
   1. Most birds make nests
   2. Some animals make colony homes
   3. Some animals use shelters they find available
   4. Man must provide shelter for domesticated animals

C. Animals must have food to live and grow
   1. Wild animals find food in the environment
   2. Animals that are domesticated by man must be fed by him

D. Man uses animals for various purposes
   1. Some animals provide pleasant companionship
   2. Some animals provide man and animals with food
   3. Some animals provide man with materials for clothing
   4. Some animals assist man in his work
   5. Some wild animals are confined in order to provide opportunities to observe and study them

E. How Do Animals Prepare for Winter?
   1. Change appearance (color and thickness of coats)
   2. Storing food
      a. by growing fat, b. by stocking a cache
   3. Change habits
      a. hibernate (bears, insects, frogs, etc.) b. stay indoors, c. gather in herds
   4. Migrate
      a. birds, b. animals.

II. PLANTS

A. Plants live in various places.
   1. Some plants live on land.
   2. Some plants live in water.

B. People and animals use plants in various ways.
   1. Some plants are used for food and clothing.
   2. Some plants provide man and animals with shelter.
   3. Some plants provide aesthetic pleasure.

C. How are plants adapted for winter?
   1. Change appearance - a. color, b. foliage.
   2. By dying.
   3. By slowing down of growth.
   4. They store food in their roots.

I. WEATHER

A. From day to day.
   1. Sun, wind, rain, snow and temperature combine in different ways to make our weather.
   2. Weather changes often.
   3. We adjust our activities to weather conditions.
   4. We can predict changes in weather.
      a. dark clouds gather before a storm
      b. when the clouds begin to break the storm is usually over
      c. a rainbow usually means the end of a rain storm
      d. it is often windy before a storm.

B. Through the seasons.
   1. The seasons are spring, summer, autumn and winter.
   2. The seasons follow in order.
   3. Seasons have characteristic weather conditions.
   4. We adjust clothing and activities to the seasons.

II. WHAT DO WE SEE ON THE EARTH AROUND US?

A. Rocks are:
   1. soft or hard
   2. big or small
   3. smooth or rough.

B. Land:
   1. is flat or hilly
   2. of some kinds can grow plants and land of some other kinds cannot
   3. is made of soil and rocks.

C. Water:
   1. is seen in lakes, rivers, streams, sloughs and oceans
   2. can make plants grow on land
   3. helps to keep us clean
   4. is the place where fish live
   5. is a place for safe play.

III. WHAT WE SEE IN THE SKY

A. We see the sun in the daytime.
B. We see the moon and stars at night.
C. We see clouds during the day and at night.
D. Sometimes we do not see the sun, moon or stars because of clouds.
E. The sun, moon and stars help us:
   1. The sun gives us light and heat.
   2. The moon and stars help us to see at night.

IV. AIR IS ALL AROUND US

A. Air is something that is real.
B. How we know there is air.
   1. We can feel it.
   2. We can see it move things.
   3. We can put it in things.

C. Air which is not fresh may not be safe.
   1. Exhaust fumes from automobiles are poisonous. We should never be in a closed garage when a car's engine is running.
   2. Too much smoke may cause a person to lose consciousness and die.

I. MACHINES

A. We have machines to help us do the work.
   1. We use machines in our homes.
   2. We use machines on our farms.
   3. We use machines in our community.

B. Machines help us in doing these things easily and quickly.
   1. Travelling.
   2. Sending messages.
   3. Moving things.
   4. Building things.

C. We should take good care of machines.
   1. They should not be left in the rain and sun.
   2. They should be fixed if they get broken.
   3. Things which are left where they don't belong may cause accidents.

II. MAGNETS

A. Magnets do interesting things.
   1. Magnets attract some things.
   2. Magnets do not attract some things.
   3. Magnets have different shapes.
   4. Toys can be made using a magnet.

GRADE II

I. ANIMALS

A. Animals must have food to live and grow.
   1. Some baby animals eat the same kind of food as the parents.
   2. Baby mammals get milk from the mother's body.
   3. The ability to move about is important in getting food.
   4. Some baby animals are able to get their own food.

B. Baby animals receive varying degrees of parental care and protection.
   1. Many baby animals get milk from the mother's body.
   2. Most baby animals that cannot move about competently are fed by the parents.
   3. Many baby animals that cannot move about competently get parental protection from other animals which might harm them.
   4. Some baby animals get no parental protection.
   5. Alberta's hunting laws protect the parent animals during the period in which the young are dependent upon them.

II. PLANTS

A. Sufficient light and water are necessary for growth.
   1. Seeds need water to germinate.
   2. Green plants die if they are deprived of light for too long at a time.
   3. Plants die if they are deprived of water for too long a time.

B. How seeds travel.
   1. Wind
   2. Water
   3. Animals
   4. Explosion

I. WHAT WE CAN LEARN FROM THE SKY

A. Direction
   1. The sun rises in the east and sets in the west.
   2. Stars help us find our way.

B. The Moon
   1. Seems to change its shape following a regular pattern each month.
   2. Has a "face".

C. Clouds
   1. There are different kinds of clouds
      a. light and fluffy - heavy and dark
      b. high and low.
      c. white and dark.
   2. Clouds change with the weather.
      a. rain clouds are low and dark.
      b. fog and mist are low clouds.

II. WHAT ARE THE CAUSES OF WEATHER

A. Causes of wet weather.
   1. Water goes into the air.
   2. Water comes out of the air.
   3. Rain falls when it is warm.
   4. Snow falls when it is cold.
   5. Sleet is a mixture of rain and snow.
   6. Fog and mist occur when the air is very wet and so heavy that clouds don't rise.

B. The heat from the sun affects weather.
   1. In the morning there is less heat from the sun.
   2. The afternoon sun is the hottest.
   3. The evening sun gives less heat.
   4. The sun is in the sky most in the summer and least in the winter.
   5. The sun is hottest in the summer and coolest in the winter.
   6. We measure heat with a thermometer.

C. Wind causes weather.
   1. Some winds cause rain or snow.
   2. Some winds dry up the rain and snow.
   3. Some winds are cold.
   4. Some winds are warm.
   5. Very strong winds do damage.
   6. Winds carry dust and smoke.
   7. There are many ways of observing the force and direction of the wind.
      a. trees bend with the wind
      b. airports use wind socks
      c. smoke from chimneys changes with the wind.

III. THE THERMOMETER

A. The thermometer is a very useful instrument.
   1. It tells us how cold or warm the air is.
   2. The liquid in the tube rises when it is warm.
   3. The liquid in the tube falls when it is cold.
   4. The thermometer helps us choose our clothing for the day.
   5. It helps us keep our homes and school comfortable.
   6. It helps us in cooking.

I. WORK

A. Work is done when things are moved.

B. Energy is needed to do work

C. Energy comes from many sources
    1. Our own muscles
    2. Springs
    3. Electricity
    4. Wind
    5. Water
    6. Animals
    7. Coal
    8. Gasoline
    9. Oil

II. MACHINES HELP US IN MANY WAYS

A. Rollers make it easier to move things
B. Wheels make it easier to move things
C. Ball-bearings make it easier to move things.

III. FUN WITH A DRY CELL
(Suggested Enrichment)

A. A dry cell will light a bulb
B. A dry cell will ring an electric bell.

IV. RUST
(Suggested Enrichment Topic)

A. Some things rust
B. Some things do not rust
C. Oil helps prevent rust
D. Paint helps prevent rust
E. Water helps cause rust.

GRADE III

I. ANIMALS

A. Animals have structures that enable them to get food in various types of habitats.
   1. Some animals can move about and get food on land.
   2. Some animals can move about and get food in water.
   3. Some animals have structures that enable them to get food on land and in water.

B. Animals have primary food-getting structures (enabling them to seize and get food into the body) and secondary food-getting structures (enabling them to locate food and get at it).

C. Wild-animal life can be conserved by man.

II. PLANTS

A. Plants with roots cannot move to obtain food.
   1. Roots get food and water from the soil.
   2. Leaves get sunshine and air.

B. Plants have "enemies" that can destroy them or retard their growth.
   1. Some insects can destroy the leaves and stems of plants.
   2. Weeds can retard the growth of other plants.

C. Plants are protected by man so that he can derive food and pleasure from them.

I. THE EARTH WE LIVE ON

A. The earth has many interesting geographic features: mountains, deserts, islands, plains, lakes, streams, rivers, oceans, water-falls, canyons, geysers.

B. Rocks, soil and plants are part of the earth.

C. We use maps and globes to find out certain things about the earth.

D. Land and water areas can be shown on a globe.

II. WONDERS IN THE SKY

A. There are many objects in the sky - sun, moon and stars.

B. The sun:
1. is the largest object in the day sky
2. is very far away
3. gives the brightest light we know
4 has been studied by scientists for many years.

C. The moon:
1. is smaller than the earth or sun
2. is nearer the earth than any other object in the sky
3. is solid like the earth
4. reflects light from the sun.

D. Stars vary in:
1. size
2. brightness
3. distance from the earth.

III. THE AIR AROUND US

A. The air is part of the earth.

B. Air is found in soil, water and some rocks.

C. Air takes up space.

D. Air in some things makes them float.

E. We live in a great ocean of air.

I. WHEELS AND LEVERS

A. Wheels
1. Wheels make work easier.
2. Wheels need axles in order to turn.
3. Wheels are operated by different kinds of force
   a. muscle
   b. motor
   c. wind
   d. moving water
4. Wheels are used in many ways
   a. moving loads
   b. transferring force
   c. pulleys

B. Levers
1. Levers make work easier
   a. they reduce the force needed to lift an object
   b. the smaller amount of force needed the smaller the distance an object moves.

II. USING MAGNETS AND ELECTRICITY

A. Magnets
1. A magnet has two poles
2. The poles are near the ends of the magnet
3. Poles are holding parts of the magnet
4. Like poles repel one another
5. Unlike poles attract one another
6. Some tools are magnetized.
7. Iron and steel tools can be magnetized
8. A compass needle is a magnet that is free to turn.

B. Electricity
1. We can get electrical energy from a dry cell
2. A dry cell, wires and a light bulb can make a complete pathway for electricity
3. A break in the pathway stops the flow of electricity
4. The flow of electricity can be controlled by a switch
5. A switch is a safety device and a convenience.

GRADE IV

HOW LIVING THINGS ARE GROUPED

I. ALL THINGS IN THE WORLD ARE PUT INTO GROUPS

A. The two biggest groups of things are living and non-living.

B. All living things are alike in that:
   1. They need food.
   2. They need water.
   3. They respire.
   4. They can grow and develop.
   5. They change as they grow.
   6. They are made of similar kinds of substances (protoplasm).
   7. They move at some stage of their lives.
   8. They have young like themselves.
   9. They can live only within a certain range of temperature and pressure.
   10. All of these similarities are necessary to distinguish between living and non-living things.

C. All living things may be divided into two large categories: The Animal and Plant Kingdoms.

D. The Animal Kingdom contains about 30 groups, of which the following are the most common or familar:
   1. Animals with backbones and a bony skeleton inside the body are called vertebrates.
      a. Fish (trout, perch, salmon)
         (1) are usually covered with scales
         (2) have fins
         (3) are cold-blooded (body temperature changes with that of surroundings)
         (4) breathe the air dissolved in water with gills
         (5) live almost entirely in water
      b. Amphibians (frogs, toads, salamanders)
         (1) lead life on water and on land (must be hatched in water)
         (2) have moist, smooth, scaleless skins
         (3) changes from gill-breathing young to lung-breathing adults
         (4) are cold-blooded (body temperatures changes with that of surroundings)
      c. Reptiles (snakes, lizzards, turtles, dinosaurs, alligators)
         (1) are covered with scales or shells made from fused scales
         (2) are cold-blooded (body temperature changes with that of surroundings)
         (3) breathe air with lungs

d. Birds (sparrow, magpie, canary, penguin)
   (1) are covered with feathers
   (2) have two wings and two legs
   (3) have a bill
   (4) are warm-blooded (have a constant body temperature)
   (5) breathe air with lungs
   (6) hatch from eggs with brittle shells
e. Mammals (dogs, cats, beavers, human beings)
   (1) have fur or hair
   (2) young are fed with milk from mother's body after birth
   (3) are warm-blooded (have a constant body temperature)
   (4) breathe air with lungs.

2. Animals without backbones or internal skeletons are called invertebrates.
   a. Insects (housefly, grasshopper, mosquito, butterfly)
      (1) have six legs at some stage of life
      (2) have two feelers at some stage of life
      (3) have a body divided into three parts at some stage of life
      (4) have a hard covering on the outside of their bodies as adults
      (5) usually breathe through holes on sides of their bodies
      (6) there are many more kinds of insects than any other form of life.
   b. Other invertebrate groups include:
      (1) spiders (have eight legs)
      (2) crustaceans (crabs, lobsters: have 10 legs)
      (3) worms (flatworms, roundworms, segmented worms)

E. The Plant Kingdom is divided into two large groups:
   1. Plants that grow from seeds.
      a. flowering plants (rose, apple tree, snapdragon, daisy)
      b. non-flowering plants (pine, spruce, fir)
   2. Plants that grow from spores (ferns, mosses, algae, fungi)

F. The World of Micro-organisms. There are many kinds of tiny plants and animals that individually are too small to be seen without a microscope.
   1. Bacteria, yeasts, viruses and protozoa are some groups of micro-organisms.
   2. Some micro-organisms cause diseases, but most are harmless and others are helpful.
   3. Most micro-organisms can reproduce by dividing into two parts.
   4. Micro-organisms may be found in or on almost everything.
   5. Micro-organisms in the soil cause the decay of dead plant and animal matter.

II. ALL LIVING THINGS EXCHANGE MATERIALS WITH THEIR ENVIRONMENT (WATER, FOOD, GASES)

A. Land animals use the oxygen in the air.

B. Water animals take oxygen from air dissolved in the water.

C. People need oxygen from the air for oxidation of their food. This process provides:
   1. Heat energy to keep the body warm.
   2. Energy to help the body move.

D. Green plants need air, water, warmth, minerals and sunlight to grow.
   1. Air gets into greenplants through tiny openings in their leaves.
   2. Plants use oxygen from the air in order to use food.
   3. Carbon dioxide from the air is one of the materials used by plants to make food.
   4. Water is needed to dissolve food materials before plants can use them.
      a. Dissolved food materials in the soil are carried into the plant when water soaks into the roots.
      b. Sap, made mostly of water, carries food materials and food to all parts of the plant.
      c. Some plants live in or on water.

E. Water is needed to make juices that dissolve and otherwise change food so that the bodies of people and animals can use it.

F. Water provides the liquid part of the blood, which carries food and dissolved gases throughout the body.

I. THE EARTH

A. The Earth
   1. The earth is shaped like a ball
   2. Spins on its axis once every 24 hours which causes day and night
   3. Travels around the sun in 365¼ days
   4. Is hot inside as shown by geysers, hot springs, volcanoes.

B. The earth has a blanket of air
   1. Air is an invisible, odorless, mixture of gases surrounding the earth
   2. Air presses against all sides of everything it touches
   3. Man has learned to use this air pressure
   4. Movement of air helps to keep us comfortable.

C. The soil is an important part of the earth's surface
   1. Soil is essential to people
   2. Soil usually forms from broken rock material
   3. Water helps change rocks into soil
   4. Humus makes soil better for plant growth
   5. Air and water are important parts of soil
   6. Many animals live in the soil.

D. The earth contains rocks and minerals
   1. Rocks can tell us many things about life on the earth long ago
   2. Most rocks and minerals can be identified
   3. Some rocks contain valuable minerals, sometimes a few, sometimes many
   4. We use rocks and minerals in many ways.

I. ELECTRICITY

A. Some interesting facts about static electricity.
   1. Many objects can be given electrical charges by rubbing them.
   2. Charged objects have electrical energy.
   3. Charged objects attract uncharged objects.
   4. Charged objects repel other objects with the same charge.
   5. Charged objects attract other object with different charges.
   6. A spark results when an electrical charge jumps through the air.
   7. Lightning is an enormous electrical spark.
   8. Thunder results when this huge spark goes through the air.

B. Making electricity work for man is a fairly recent and very significant development.
   1. Electricity is used every day in many ways.
   2. The electric current coming into buildings is powerful and can produce a dangerous shock.
   3. It is safe to work with dry cells because they have low electrical pressure (voltage).

4. Some objects are good conductors of electricity, and others are poor conductors (semi-conductors) or non-conductors.
5. Non-conductors are used as insulators to prevent short circuits.
6. Electromagnets are made by using electricity.
7. Electromagnets are used by man in many ways because they can be turned on or off.
8. Learning to use electricity safely is very important.

II. OUR BODY IS A MACHINE

A. Our body resembles a machine in a number of ways.
   1. Muscles make part of our body move.
   2. Our bones and joints are levers.
   3. Foods provide energy.

III. MACHINES HELP MAN

A. Machines make available sources of energy that assist man in many ways.
   1. Air pressure aids in aviation.
   2. Compressed air is used as a source of power.
   3. Many machines use electrical energy.
   4. Coal, petroleum and natural gas are important sources of energy. (Point out that these fuels are unrenewable resources.)

GRADE V

WHERE DO PLANTS AND ANIMALS COME FROM AND HOW DO THEY GROW?

I. ANIMALS

A. Most mammals give bifth to living young.
   1. Mammals grow from a very tiny fertilized egg.
   2. Because they develop inside the mother's body, mammals give birth to very few young at one time.
   3. During their development, mammals are well protected inside the mother's body.
   4. Most mammal parents care for their young.

B. Birds hatch from eggs.
   1. Eggs contain yolk which is food for the developing bird before it hatches.
   2. The adults of most kinds of birds care for their young.
   3. Bird eggs require warmth to be hatched. In many cases the adult birds supply this warmth from their own bodies by sitting on the eggs.

C. Amphibians hatch from eggs.
   1. The eggs of amphibians do not have shells.
   2. Such eggs are laid in water and fertilized by the male.
   3. They develop without further care by the adults.
   4. Amphibian young (tadpoles) do not resemble their parents, until they develop into the adult stage.

D. Many reptiles hatch from eggs.
   1. The eggs of reptiles have a leathery covering instead of a brittle shell.
   2. Reptile eggs are usually laid on land where the young are born alive.
   3. In a few kinds of reptiles, the eggs hatch inside the mother and the young are born alive.
   4. Snakes shed their skins as they grow bigger, and grow new ones.

E. Most fish hatch from eggs.
   1. Fish eggs are laid in great numbers at one time.
   2. Fish eggs do not have any shell-like covering.
   3. Most kinds of fish do not take oare of their young.
   4. Very few of all the eggs produced survive after development to grow to adults. They provide food for other forms of water life.
   5. In some kinds of fish, the eggs hatch within the mother's body and are born alive.

F. Insects hatch from eggs.
   1. Many insects lay great numbers of eggs at one time.
   2. Insect eggs usually have a hard protective covering.
   3. Very few of all the eggs produced by an insect survive to adult stages.
   4. Insects go through different stages from young to adults.
      a. Moth and butterfly eggs hatch and produce caterpillars; caterpillars spin a cocoon or chrysalis inside of which they develop as an adult with wings. The adult moth or butterfly comes out of the cocoon or chrysalis in the spring.
      b. When grasshopper eggs hatch the young resemble the adults except that they are much smaller. As they grow larger, they moult or shred their outer covering several times until the adult stage is reached.

G. Other animal groups:
   1. Spiders
      a. Often produce many eggs inside of a large egg case.
      b. Many young spiders develop inside the egg case and hatch out at about the same time.
      c. Spiders shed their outer covering several times as they grow.
   2. Crustaceans
      a. These animals produce many eggs at one time.
      b. The eggs hatch into free-swimming young that go through various stages to adult form.
      c. Eggs of crustaceans do not have any shell-like covering.
      d. Some crustaceans can regrow parts of their body such as legs or claws.

H. The fewer young produced the greater parental care is usually exercised.
   1. Producing many young out of which a few survive to adulthood is one kind of protection some animals have developed to carry on their kind.
   2. Producing very few young that are cared for by the parents is another kind of protection some animals have developed to carry on their kind.
   3. Care of the young for maximum survival is carried out most effectively by human beings in family and school life.

II. PLANTS

A. Some plants grow from seeds.
   1. Plants produce seeds before they die. In the spring these seeds begin to grow into new plants.
   2. The flower is a plant's seed-producing organ.
   3. Flowers contain tiny eggs that are fertilized by pollen to form the living part of a seed.
   4. The wind and nectar-collecting insects transfer pollen from one flower to another and make seed-formation possible in some kinds of plants.
   5. The seeds of many plants are scattered by the wind and carried by many kinds of animals to places where they may grow.
   6. A seed contains an emboryo plant and some food, and is usually surrounded with a tough coat or shell.
   7. In the presence of water, air and warmth the young plant inside a seed starts to grow.
      a. Food that is stored in the seed is used by the young plant until it grows green leaves.
      b. The gree leaves are the food-making organs of the plant.
      c. One part of the young plant grows above ground to become the stem and leaves; another part grows below ground to form the root system.
      d. Water and minerals in the soil enter the plant through the roots.

B. Some plants may be grown from parts other than their seeds.
   1. A piece of such plants grow to form an entire plant.
   2. Some plants grow from roots.
   3. Some plants grow from pieces of stems and leaves called cuttings.
   4. Some important farm crops are grown from parts of plants other than seeds, e.g., potatoes.
   5. In grafting, a bud or a branch of one kind of plant can be made to grow on the stem of a different plant.

C. Plants that do not form seeds such as molds, mushrooms and ferns grow from spores.
   1. A mold or mushroom plant produces millions of dust-like spores.
   2. The tiny spores can be carried many miles by the wind.
   3. Each spore can grow into a complete new plant.
   4. Microscopic plants (bacteria, yeast, etc.) reproduce by dividing into two ore more parts. Each part grows to become a complete organism.
   5. Micro-organisms multiply very quickly since their number doubles each time they reproduce.

III. WHERE PLANTS GROW

A. Interesting relationships between plants and environment.
   1. Physical conditions of heat, light, air and moisture determine what kinds of plants can grow in a region.
   2. Some animals use plants as food.
   3. The roots of some plants hold the soil in place and keep it from being blown away by the wind.
   4. A weed is any plant growing where it is not wanted.

I. WHAT IS THE UNIVERSE LIKE?

A. Solar System
   1. We could not live without the sun. Without it we would not have:
      a. heat
      b. any light
      c. any food
      d. any energy
   2. The sun is the center of our solar system which contains:
      a. nine known planets
      b. the planetoids
      c. satellites
   3. The planets vary in size, distance from the sun, speed of revolution and number of moons.
   4. Each of these revolves around the sun in a fixed path called an orbit.
   5. Each planet at the same time rotates on its axis.
   6. Planets are held to their orbit by opposing forces.
   7. The movements of the solar system are regular and exactly predictable.
   8. While there is no proof of the existence of life on any planet but the earth, conditions favorable to life do exist on some other planets.

B. What are comets?
   1. Comets are made up of gases and little bits of solids.
   2. The orbits of comets and planets often cross.

C. What causes an eclipse?
   1. An eclipse of the sun is caused by the moon passing between the earth and the sun.
   2. An eclipse of the moon is caused by the earth passing between the moon and the sun.

D. What is beyond the solar system?
   1. Beyond our solar system are uncounted numbers of suns (stars) and perhaps other solar systems.
   2. Distances between stars are so vast that scientists measure them in light years.
   3. A light year is the distance that light travels in one year.

E. The birth of our earth.
   1. Theories re the formation of the earth.
   2. Ice-ages
   3. Forces of erosion) the process of building
   4. Mountain building) up and tearing down.
   5. Layers of the earth
   6. Formation of soil
   7. Man's effects on the soil. (Man has speeded the process of erosion so that top soil is wearing away much faster than it is being built up.)

I. ELECTRICITY: PRODUCTION AND CONTROL

A. Where electric current comes from:
   1. Electric current can be produced by chemical change in a dry cell or wet cell. Use of diagrams to explain working but not actual chemical reactions.
   2. Electric current can be produced by generators that use the energy of water, wind, steam, or exploding gases. Explanation that electricity comes from wire turning in a magnetic field; without going into the reason for this.

B. Static electricity:
   1. How lightning is produced.
   2. Protection from lightning - lightning rods.
   3. Static electricity in trucks and airplanes.

C. How electric current flows:
   1. Electric current will flow only if there is a closed circuit.
   2. Proper use of electrical appliances to avoid danger.
   3. How light bulbs and sockets work-diagrams.
   4. How neon and fluorescent lights work.

D. Why electric wires are insulated:
   1. Cause and result of short circuits.
   2. Prevention of short circuits - fuses and circuit breakers.
   3. Electric wires are extremely dangerous if not properly insulated.

E. How electric current is controlled:
   1. Closing and opening a circuit by using various types of switches.
   2. Making a circuit stronger and weaker by using a transformer or more and fewer cells.

F. How electric current is used to produce heat:
   1. Poor conductors become hot when current is passed through them.
   2. How this is used in certain appliances.

G. How electric current gives us light:
   1. Some poor conductors become so hot that they give off light.
   2. Some light is made with gases that glow when electric current flows through them.

H. How electric current is used to make a magnet:
   1. Current is passed through wire wound around iron or steel.
   2. Use of the electromagnet to produce motion - electric motor.

II. EFFECT OF HEAT AND COLD ON MATERIALS

A. Heat travels.
   1. Some things conduct heat better than others - air, metal, wood, etc.
   2. This knowledge is applied in insulation.

B. How do heating and cooling change the size of solids?
   1. Heating makes most solids expand or get larger.
   2. Cooling makes most solids contract or get smaller.

C. What happens to liquids when they are heated or cooled?
   1. Heating makes most liquids expand.
   2. Cooling makes most liquids contract.
   3. When liquids expand they become lighter.
   4. Warm water is pushed upward by the colder, heavier water, which sinks.

D. How is hot water used to heat a house?
   1. Gases expand when heated.
   2. Gases contract when cooled.
   3. Gases become lighter when they expand.
   4. Cold air sinks and pushes warm air upward.

E. How does a hot air furnace work?
   1. Hot air can be used to heat a house.

F. How are solids changed to liquids?
   1. Different solids melt at different temperatures.
   2. The temperature at which a solid melts is called its melting point.
   3. Ability to make alloys and shape metals.

G. How are liquids changed to gases?
   1. When a liquid boils, it changes to a gas.
   2. Different liquids boil at different temperatures.
   3. The temperature at which a liquid boils is called its boiling point.
   4. A liquid does not get any hotter than its boiling point.

H. How is water vapor changed to liquid water?
   1. Gases change to liquid or condense when they are cooled.
   2. Water vapor in the air condenses if the air is cooled enough.

I. All materials are either solid, liquid, or gas.
   1. Materials change their form with sufficient change in temperature; e.g., water, carbon dioxide, iron, etc.

III. WHAT ARE THINGS MADE OF?

A. How are materials different from each other?
   1. Every kind of material has its own characteristics.
   2. The use of a material depends on its characteristics.

B. How can we change the characteristics of materials?
   1. Physical change is a change of characteristics without making a new material.
   2. Chemical change is a change of characteristics in which an entirely new material is produced.

C. What are elements?
   1. All materials are made up of elements.
   2. An element is the simplest kind of material; it is made only of itself.
   3. There are more than 100 known elements.
   4. Elements can be solids, liquids, or gases.
   5. Interesting facts about elements, Oxygen, Hydrogen, Helium, Mercury, Carbon, Carbon Dioxide, Atom Bombs, Radio Activity.

D. What are compounds?
   1. Elements combined in chemical change to make compounds.
   2. These compounds are an entirely new material.
   3. These are a large number of compounds.

E. What are molecules?
   1. The smallest possible particle of most substances is a molecule.
   2. Each kind of element and each kind of compound consists of only one kind of molecule.
   3. How we see molecules (electron microscopes).
   4. Molecules move (evaporation, osmosis, etc).
   5. Heat makes molecules move faster.

F. How do we use chemical changes?
   1. We use chemical changes to produce new material with the gain or loss of heat.

G. Prevention of harmful chemical changes.
   1. Harmful chemical changes can be prevented by:
      a. keeping the elements apart
      b. keeping some materials dry
      c. keeping some materials cool
      d. keeping some materials out of the light.

IV. HOW DO WE CONTROL FIRE?

A. Materials to make a fire.
   1. We need these three things to make a fire.
      a. combustible material
      b. enough heat to raise the material to its kindling temperature.
      c. air near the material.
   2. Heat to start a fire may be produced with friction.
   3. Matches help us light fires easily, but they must be used with care.

B. What happens when things burn?
   1. When any material burns, it gives off heat and light and becomes smaller.
   2. When any material burns a chemical change takes place.
      a. carbon contained in material combines with oxygen to form carbon dioxide
      b. hydrogen contained in material combines with oxygen to form water
      c. minerals are left as ashes
      d. if enough oxygen is not present the carbon remains uncombined as smoke.

C. How can we conserve our fuels?
   1. We must conserve our coal, oil, gas, etc., because these supplies won't last forever and cannot be replaced.
   2. Fuels may be conserved by using them carefully.
   3. Fuels may be conserved by using new kinds of fuels or other sources of energy.

D. What can we do to prevent fires?
   1. Accidental fires can be avoided by preventing the three things needed for burning from coming together.

E. How can we put out fires?
   1. Fires should be reported to the fire department promptly.
   2. Fires can be put out by removing one or more of the things needed for burning.

GRADE VI

I. WHAT IS THE HISTORY OF LIVING THINGS?

A. What were living things like long ago?
   1. The earth is very old.
   2. Living things have changed.
   3. New living things are appearing and others disappearing.

B. How do we know what living things were like long ago?
   1. Fossils tell us.
   2. There are several kinds of fossils:
      a. petrification (plants and animals)
      b. impressions (plants and animals)
      c. casts (plants and animals)
      d. encasement (in tar, amber, ice)

C. What do fossils tell us?
   1. Fossils show changes have occurred in:
      a. earth's surface
      b. climate
      c. living things

D. How have animals and plants changed?
   1. Fossils show development from simple to complex forms.

E. Why have some plants and animals continued to live on the earth while others have died?
   1. Changes in the earth's surface and climate make it necessary for living things to:
      a. adapt
      b. move
      c. die

II. THE INTERDEPENDENCE OF LIVING THINGS

A. Animals
   1. Some kinds of animals, called social animals, live and work together in a colony.
   2. Some animals, such as ants and aphids, are mutually helpful.
   3. Some animals grow up in families.
   4. Some animals join together in groups for hunting and for protection.
   5. Some animals are food for other animals.
   6. Plants help animals by providing food and shelter.
   7. Bees and other insects carry pollen from one flower to another.
   8. Birds eat destructive insects.
   9. Earthworms cultivate the soil.
   10. Animals scatter seeds.

B. Plants
1. Some plants furnish food or water for other plants.
2. Some plants furnish shade and protection for other plants.
3. Some plants climb on others to reach sunlight.
4. Decayed plants enrich the soil and thus help other plants.
5. Some plants are poisonous to animals.
6. Plants such as fungi destroy other plants.
7. Some plants capture animals for food.
8. Some kinds of plants (bacteria) cause disease in other plants and in animals.
9. Stronger plants take water, food materials and sunlight from weaker ones.

C. Plants and Animals
1. Animals use either plants or other animals for food.
2. Insects are great enemies of plants and other animals.
3. All our food comes directly or indirectly from plants.
4. We use plants for clothing, wood, rubber, medicine, etc.
5. Plants hold the soil in place and thus help prevent floods and dust storms.
6. Food, clothing and other products come from animals.
7. Some animals protect us or do work for us.
8. Some animals destroy plant and animal pests.
9. We raise and take care of plants and animals on farms.
10. Some plants and animals have adaptations for protection and shelter.

III. PROBLEMS OF MAN IN SPACE

A. Effects of G-force - a force much like gravity. One gravity (1G) is equal to the gravity we usually feel on earth.
1. The G-force increases as the rate of acceleration increases.
a. astronauts may have to endure 7 to 9 G
b. this acceleration is the easiest to endure in the supine position
2. The G-force is zero when the rockets are shut off and the capsule is in free flight. This is weightlessness.
a. everything that isn't fastened "floats"
b. prolonged weightlessness may produce space sickness.

B. Materials and environmental conditions within the capsule.
1. Equipment designed to protect the occupant makes up much of the weight of the capsule.
2. The environmental conditions within the cabin are somewhat similar to those on earth.
a. the cabin is pressurized
b. the temperature is controlled by a type of air conditioner called a heat exchanger
c. the air is cycled for re-use
d. excess water vapour, carbon-dioxide, and other wastes are removed from the air by chemical means
e. supplies of liquid oxygen are stored in tanks.
3. The space suit gives more protection.
4. Runny foods are packed into squeeze tubes. Other foods are compressed into bite-sized cubes.
5. During longer trips water may be cycled for re-use.

C. Effects of close confinement (Enrichment).

I. WEATHER AND HOW WE FORECAST IT

A. Causes of precipitation
   1. Rain
      a. sun causes moisture to evaporate from the earth's surface
      b. moisture is held in the air in the form of vapor
      c. cold air holds less moisture than warm air
      d. when there is too much moisture in the air for the temperature, precipitation occurs
      e. in warm weather this precipitation is in the form of rain
   2. Hail
      a. hail is the result of the following things happening:
         (1) raindrops fall
         (2) they are caught by up-drafts of air
         (3) if sufficient height is reached, they freeze
         (4) becoming heavy, they fall again
         (5) nos. 3 and 4 may be repeated numerous times, each time altering the size of the hailstone.
   3. Snow
      a. refer to "rain" above and the same concepts apply except the air is at freezing temperature
      b. each snowflake has its own shape
   4. Sleet
      a. this is a mixture of rain and snow.

B. Causes of Wind
   1. Wind is air in motion.
   2. Heat causes air to rise
   3. Colder air rushes in to take its place.

C. Weather Forecasting
   1. Weathermen keep records pertaining to
      a. wind direction and velocity
      b. moisture content of the air
      c. temperature
      d. pressure of air
   2. This has enabled them to tell what conditions precede various types of weather.
      a. high pressure means continuation of current weather
      b. low pressure precedes a wind which may bring storms of various kinds
      c. high moisture content may bring rain or snow.
   3. Use of weather satellites.

II. THE NATURE OF SPACE

A. Definition of space.
Almost a vacuum: only scattered meteors, radiation particles, electrically-charged (ionized) gases.

B. Beginning of space.
1. 99% of the atmosphere lies below 20 miles.
2. At 75 miles up meteors glow from friction against air.
3. At 100 miles enough air remains to slow down satellites.
4. For practical purposes space begins above 100 miles from the earth's surface.

C. Divisions in space.
1. Cislunar space - on this side of the moon.
2. Translunar space - on the other side of the moon, but within the earth's and moon's gravitational field.
3. Interplanetary space - within the sun's gravitational field.
4. Interstellar space - space between the stars.
5. Intergalactic space.
   a. space between the galaxies
   b. never-ending.

D. Use of space probes to further our knowledge of space.
1. Meteors and micrometeorites
2. Magnetic fields
3. Solar radiation
4. Belts of Van Allen radiation
5. Moon probes
6. Secrets of Venus probed.

E. Theories of the origin of the universe.
1. Theory of the expanding universe (Big Bang Theory).
   a. about three or four billion years ago everything may have been one big gaseous mass
   b. this mass exploded and the material moved outward and away
   c. the material slowly moulded into the forms we know now
   d. these galaxies are still moving farther apart.
2. Other theories - "Steady State", etc. (Enrichment).

I. HOW MACHINES CAN FLY

A. Before machines could fly
   1. Men tried to imitate birds but their muscles were not strong enough
      a. Greeks
      b. Da Vinci
      c. Besnier
   2. Plants float by:
      a. large but light wind catchers (milkweed, dandelion, cottonwood)
      b. by whirling like a propeller (maple, ash)
      c. by skimming like a plate (elm)
   3. Insects that fly, fly by flapping their wings very rapidly
   4. Flying squirrels jump and float on the sail made by their skin
   5. A bat has skin-wings
   6. Flying fish leap and sail
   7. All birds can't fly
   8. Most birds are built for flight
      a. their wings are larger than their bodies
      b. they have very strong muscles
      c. their bones are strong and light (hollow and spongy)
      d. they eat a large amount of food for energy
      e. their feathers are built to push the air and yet are very light
      f. gulls glide and soar on rising air currents.

B. Gliders
   1. Use the wind and air currents as gulls do
   2. They get off the ground by:
      a. ground two
      b. air-tow
      c. catapult
      d. reeling in on power take-off of truck
   3. Their travel depends on the air currents
      a. max. height 3 miles
      b. max distance 500 miles
      c. max. time 50 hours

C. Aeroplanes with motors
   1. Propellers pull plane through air.
   2. The curved profile of the wing keeps it in the air by creating unequal pressures.
   3. Air tunnels are used to experiment with wings.
   4. Most aeroplanes can't slow down or they will drop
   5. Helicopters move their wings and therefore can stay in the air.

D. First Aeroplanes
   (examine story of early flights, e.g., Wright Bros., etc.)

E. Jet Aeroplanes
   1. Jet aeroplanes fly in the same way that balloons fly when we cut the string that holds the nozzle.
   2. Scientists have to develop new shapes to meet the needs of tremendous speeds.

F. Rockets and space vehicles.
   1. How rocket engines are different from other engines.
      a. work according to Newton's Third Law of Motion which simply stated says "for every action there is an equal but opposite reaction".
         i. the escape velocity of the gases from the rocket cause it to move in the opposite direction
         ii. the faster the gases escape, the faster the rocket moves.
      b. chemically-fuelled rocket engines carry not only their own fuel but also their own oxidizer. Therefore they can operate when there is no atmosphere.
      c. nuclear power and ion power are being experimented with for the propulsion of rocket engines.
   2. The need for man in space flights.
      a. the automatic instruments are masterpieces but are no match for the human brain.
      b. these advanced instruments can only report; they cannot evaluate what they "see".
      c. the combination of man and instruments is best.
      d. satisfaction of man's curiosity.
   3. Launching a satellite.
      a. multi-stage rockets are used because as each rocket stage exhausts its fuel, it drops off, thus reducing the total weight of the launch vehicle and making the job easier for the succeeding rockets.
      b. the two main kinds of chemical fuels for rockets are liquid and solid chemicals.
      c. velocity required for:
         i. orbit around earth - about 18,000 miles per hr.
         ii. reaching the moon, Mars, Venus, (escaping Earth's gravity) - 25,000 miles per hour.
      d. space vehicles may be guided:
         i. from within the capsule
         ii. by those ground stations whichare two-way communication control stations.
   4. Benefits from space travel or satellites.
      a. new knowledge of the solar system, space, etc.
      b. use in weather forecasting
      c. improving world communication
      d. serving as aids to navigation
      e. mapping the earth more accurately

   5. Space travel in the future (Enrichment)
      a. space stations
      b. describe trip to moon, Venus, Mars.

II. HOW MACHINES HELP US TO DO WORK

A. What is work? Work is force applied through distance.

B. What is a machine?
   1. A device to make work easier
   2. A force must be used to make a machine work.
   3. Simple machines have only a few parts.
   4. Complex machines are made up of simple machines put together differently.

C. Levers
   1. All levers have three parts
      a. fulcrum
      b. the part where force is used
      c. the part where work is done
   2. The nearer the fulcrum of the lever is to the weight, the easier the weight is to lift.
   3. The lever increases the force or changes the direction of the force
   4. Do experiments: see-sw, crow-bar, prying lids from cans, scissors.

D. Inclined Planes
   1. A weight can be pushed or pulled up an inclined plane more easily than it can be lifted.
   2. A wedge is two inclined planed joined together.
   3. A screw is an inclined plane that winds around as it climbs.

E. Pulleys
   1. A fixed pulley can be used to change the direction of force.
   2. A movable pulley can be used to increase the force.
   3. Pulleys can be combined in a block and tackle. The more movable pulleys that are used, the easier it is to move the weight.

F. Wheel and Axle
   1. When a big wheel is fastened to a small axle, a little force on the wheel will move a heavy weight attached to the axle.
   2. The wheel turns the axle, which does the work
   3. The turn on the wheel gives the axle more force.
   4. One wheel can turn another
      a. by connecting them with a belt
      b. by connecting them with gears
      c. a large wheel turning slowly will turn a small wheel rapidly.

G. How can we make machines work better?
   1. Friction results when two things rub against each other.
   2. Friction wastes energy and thus requires extra force.
   3. Friction is reduced by making surfaces as smooth as possible.
   4. Friction causes materials to wear out and to become hot.
   5. Friction is reduced by using oil, grease, wheels, rollers and ball bearings.
   6. Friction sometimes helps machines to work better
      a. car on slippery street has no friction so the wheels only spin about.
      b. there must be friction to make roller skates go.
      c. friction is needed for starting any motion.

H. Safety
   1. Machines can be dangerous and must be used carefully.
   2. Accidents cause injuries and waste time and money.
   3. Wise use of manpower includes using the best safety measures.

III. WHAT IS SOUND AND HOW DOES IT TRAVEL?

A. How are all sounds alike?
   1. All sounds are made by vibration.

B. How do living things make sounds?
   1. In people and most higher animals sound is produced by vibration of vocal cords.
   2. In many insects sound is made by vibration of wing parts.

C. How do sounds travel?
   1. Sounds travel by vibrations in the air called sound waves
      a. sound waves travel in all directions from a thing that is vibrating
      b. sounds travel through solids, liquids, and gases
      c. sound travels at about 1100 ft. per second in air.

D. How can we control sound waves?
   1. Sound waves can be guided to travel in certain directions
      a. megaphone
   2. Sound waves can be reflected to make an echo
   3. Echoes in rooms can be prevented by using special materials on walls and ceilings.

E. Why are sounds different?
   1. The highness or lowness of a sound depends upon the speed of vibration. The faster the material vibrates the higher the sound produced.
      a. thin materials can vibrate faster than thick ones.
      b. more tightly material is stretched, the faster it can vibrate.
      c. short lengths of material can vibrate faster than long ones.

2. The loudness of the sound depends upon the force with which it vibrates.
   a. how far it moves in vibrating
3. Vibrations may be too fast or too slow for us to hear them - inaudible
   a. move hands - too slow - too low
   b. dog whistle - too fast - too high
   c. range (normal - 20-20,000 vibrations per second)

F. How do musical instruments make sounds?
1. All musical instruments make sounds by making air vibrate
   a. in stringed instruments, sounds are made by vibration of strings. High and low sounds vary according to length, thickness and tightness of strings
   b. in wind instruments high sound is made by vibration of a short column of air and a low sound made by vibration of long column of air.

G. How our ears work
1. We hear sounds because the sound waves travel towards our ears and make the inner parts vibrate. Nerves carry the message of the vibration to the brain which interprets them into meanings.
2. It is very important to take good care of the ears.

IV. WHAT DO WE KNOW ABOUT LIGHT?

A. Where do we get light?
1. Most of our light comes from some material that is heated till it burns
2. Cold light - fireflies, sea animals, radium paint, etc.
3. Many ways have been used to get light, e.g. candles, sunlight, starlight.

B. How does light travel?
1. Light travels at a tremendous speed
2. Light travels in a straight line
3. Light travels outward from its source in all directions.

C. Why can we see things?
1. We can see objects because they give off light or reflect light.
2. Light is reflected by most materials
   a. smooth surfaces reflect more light than rough surfaces.
   b. light colored materials reflect more light than dark colored materials
   c. moonlight

3. Light is absorbed by many materials
   a. dark colored materials absorb more light than colored materials.
4. Light can pass through some materials but not through others
   a. opaque materials
   b. transparent materials
   c. translucent materials

D. Why can you see yourself in a mirror?
1. An object can be seen in a mirror because light travels from the object to the mirror and is reflected back again.
2. Light travels away from the mirror on the same slant at which it strikes the mirror.

E. What do lenses do to light?
1. Light is bent when it travels through a lens
2. The bending of light that travels from an object through a lens changes the apparent position of size of the object.

F. How do we see things which are small or very far away?
1. The use of lenses can make far away objects seem larger.

G. How our eyes work
1. Different parts of the eye work together so that we can see
2. Too much light is dangerous: looking into the sun, looking at the light from ore welding.

H. Why do things have different colors?
1. The color of an object is caused by the way in which it reflects certain light rays and absorbs others.
2. Sunlight is a mixture of light rays of many colors
3. The colors of sunlight are separated when sunlight passes through a prism.
4. White is not a color, it is a mixture of all colors
5. Black is not a color, it is lack of color.

I. Proper lighting is important
1. Amounts for various purposes
2. Types of lighting, indirect, etc.

SASKATCHEWAN

SCIENCE

YEAR I

PLANTS AND ANIMALS (Late Summer and Fall)

A. Common Plants Within the Local Environment:
Identification of a few of the following:
(a) Garden Flowers - bringing some to school, making bouquets.
(b) Wild Flowers (see appendix) - observing where they grow.
(c) Trees - identifying common ones; collecting and examining leaves of various kinds.
(d) Vegetables - making Thanksgiving posters.

B. How Plants Prepare for Winter:
(a) Some produce seeds - collect and store a few kinds for growth in the spring.
(b) Some store food in roots - carrot, parsnip.
(c) Some produce bulbs - tulip, hyacinth, narcissus.
(d) Some produce fruit - common berries, crabapple.
(e) Some change in appearance and go to sleep - trees, shrubs.
Draw and colour pictures from specimens of the above.

C. Recognizing Our Animal Friends:
(a) A few common wild and domestic animals (see appendix):
1. Appearance
2. Ways of obtaining food and shelter.
3. Preparation for winter.
(b) A few common birds (see appendix):
1. Appearance
2. Noting their activities of flocking and migration.
(c) Making a picture gallery of birds and other animals.
(d) Stocking and caring for an aquarium.

PLANTS AND ANIMALS (Winter)

A. Some Plants Grow Indoors:
Identify and grow several plants in the classroom.
B. Some Plants Help Man and Animals:
(a) provide food, shade, beauty, shelter, and homes.
(b) Discuss examples of each of the above.

C. Our Animals Friends in Winter:
(a) Identification and study:
1. What animals are seen in winter? (See appendix).
Where do they live?
What do they eat?
2. What birds are seen in the winter?
Where are they seen?
Encourage wide feeding.

(b) First hand acquaintance with pets:
1. Hamsters, white rats, gold flish, rabbits, canaries. (These should be cared for in the homes, and only brought to school for very short intervals).

(c) How animals help man:
1. Provide him with food, companionship, clothing and power.

(d) How man helps animals:
1. Provides food, shelter, and protection.

CONSERVATION (Relate to other course topics at appropriate times)

A. Our Friends the Trees:
(a) Learning not to damage trees; discussing harm caused by removing bark, carving initials, breaking branches.

B. Our Friends the Flowers:
(a) Learning to pick in the correct manner only a few wild flowers; noticing the beauty of flowers in their natural surroundings.

C. Our Friends the Birds:
(a) Feeding birds in winter.
(b) Learning not to destroy birds' eggs or nests.
(c) Helping birds escape from cats.

MATTER AND ENERGY

Simple Understanding of Work and Energy:
(a) People can work when they have strength and they get this strength from food.
(b) The sun gives light and heat which help to grow our food and keep us warm. We need light in order to see things.
(c) Magnets attract some things and will not attract other things.

THE UNIVERSE, EARTH, AND WEATHER

A. What can we see in the sky?
Locating and discussing the sun, moon and stars.

B. The Seasons:
1. The four seasons and their characteristics.
2. The changing length of days and nights.

C. Our Weather:
1. Observing clouds, wind, various types of weather, water forms (fog, rain, ice and snow).
2. Keeping a weather calendar.

PLANTS AND ANIMALS (Spring and Early Summer)

A. Outdoor Plants Come to Life in the Spring:
   (a) Gather bouquets of pussy willow and poplar catkins.
   (b) Make a field trip to observe some common wild flowers.
   (c) Identify early bulb flowers: tulips, daffodils, prairie crocus.

B. Needs of Growing Plants:
   (a) Plant a few beans, peas, radishes and note growth.
   (b) Discuss common needs of growing plants: food and water, warmth, air, light.

C. New Animal Friends Arrive:
   (a) Birds:
      1. Noting the re-appearance of birds.
      2. Studying the life story of a common bird.
      3. Keeping a picture gallery up to date.
   (b) Other Animals:
      1. Noting the re-appearance of some animals.
      2. Observing farm animal babies such as calves, colts, lambs, pigs, puppies or kittens.
      3. Keeping a picture gallery up to date.

YEAR II

PLANTS AND ANIMALS (Late Summer and Fall)

A. What Plants Have in Common:
   (a) Have stem, leaves, flowers, roots, seeds.
   (b) Change colours during fall season.
   (c) Identify several kinds of broad-leaved trees and note how they are alike - do the same with several evergreen types (spruce, pine).

B. Animals Prepare for Winter:
   (a) Observing the flocking of birds and studying some of the aspects of migration.
   (b) Observing how various mammals prepare for winter: home building, storing food, heavier coats, and colour changes.
   (c) Observing caterpillars and cocoons.
   (d) Noting flies seeking the warmth of houses and barns.

PLANTS AND ANIMALS (Winter)

A. Activities:
   (a) Plant and care for several types of flowers.
   (b) During February place twigs in water in a warm classroom and note the appearance of buds.

B. Knowing and Caring for Our Winter Friends:
   (a) Listing mammals seen in winter and noting which are winter sleepers (see appendix).
   (b) Listing birds which remain for winter and those which disappear (see appendix).
   (c) Feeding and caring for pets.
   (d) Preparing and maintaining a winter feeding station for birds.
   (e) Learning how two or three of our domestic animals are our helpers and how we should care for them.
   (f) Caring for an aquarium.

INTER-RELATIONSHIPS OF LIVING THINGS (Relate to other course topics at appropriate times)

Most of the material in this section can be effectively incorporated into the units on plants and animals.

A. Man Uses Plants in Many Ways:
   (a) Clothing.
   (b) Food.
   (c) Shelter.
   (d) Beauty.
   (e) Shade.

B. Man Uses Mammals for Various Purposes:
   (a) Food.
   (b) Clothing.
   (c) Companionship and pleasure.
   (d) Work.

C. Animals Must Have Food and Protection in Order to Live and Grow:
   (a) Baby mammals get milk from the mother's body.
   (b) Many baby animals get parental protection from their enemies.
   (c) Many baby animals are fed by their parents.
   (d) Some baby animals are able to get their own food.
   (e) Birds live only when plant and animal food is available.

CONSERVATION (Relate to other course topics at appropriate times)

A. Learning of Fire Prevention Rules for the Conservation of Nature's Beauty:
   (a) Observing and discussing some of the beauties of nature.
   (b) Discussing the damage done by fire.
   (c) Learning how nature can be protected from fire (Discouraging carelessness).

B. Participating in planting trees and flowers; cleaning up litter:

MATTER AND ENERGY

A. Our Sun:
   (a) The sun melts snow and dries up wet roads.
   (b) Description of the sun and the wind and some things they do for us.
   (c) A simple understanding of the meaning of work and energy.

B. How Things Move:
   (a) Observing blocks, balls, rollers, and wheels.
   (b) Slide weights up ramps with and without rollers.

C. How We Use Heat:
   (a) Certain things which burn are used to heat our homes, cook our food, and give us light:
   wood, coal, oil, gas, and candle wax.

D. Magnets:
   (a) Some parts of magnets attract each other and some parts push each other away.
   (b) Magnetic and non-magnetic substances (experiment and list).

THE UNIVERSE, EARTH, AND WEATHER

A. Our Universe:
   (a) The Sun -
      1. It is a very large, hot ball of burning gas.
      2. Rises in the east and sets in the west.
      3. Makes shadows and tells us the time of day.

(b) Identifying the Big Dipper and the North Star.
(c) Learning directions: N, S, E, and W.
(d) Noting and recording the lengthening and shortening of days.

B. Wind and Water:
(a) Wind is air in motion.
(b) Observing water changing from liquid to solid to vapour.
(c) How wind and water help us.
(d) Examining snowflakes and cutting out snowflake designs.
(e) Drawing scenes illustrating the different seasonal changes in weather.

C. Observing Weather Throughout the Year:
(a) Observing the rise and fall in temperature as indicated by a thermometer.
(b) Observing the direction of the wind as indicated by a weather vane.
(c) Preparing a weather calendar.
(d) Observing various clouds and noting which type precedes rain storms.
(e) Finding out that there is water in air.
(f) Discussing the value of rain to man and plants.
(g) Observing the effect of frost upon plants.

PLANTS AND ANIMALS (Spring and Early Summer)

A. How Plants Grow:
(a) Examine growth of pussy willow buds and leaves.
(b) Plants seeds (such as beans) and observe growth.
(c) Observe growth of garden plants (which appear first).
(d) Note that some plants grow other than from seeds.
(e) Learn to recognize five flowers, three shrubs, and five trees common to the community.
(f) Plant seeds in window boxes.

B. New Life and Activity:
(a) Recognizing early spring birds (horned larks, crows, meadow larks, and robins). See Appendix.
(b) Studying the nesting activities of some of these birds.
(c) Watching for the re-appearance of gophers, frogs, chipmunks, and noting their spring activities. (See Appendix).
(d) Observing and discussing farm animal babies.
(e) Studying the life story of a kitten, pup, or other animal.
(f) Observing the emergence of butterflies and moths.
(g) Setting up a terrarium.

YEAR III

PLANTS AND ANIMALS (late Summer and Fall)

A. How Plants Vary in Size, Shape and Colour:
   (a) Make a field trip to observe common wild and garden flowers.
   (b) Note differences in shape, size, colour; number of petals.
   (c) Observe interesting individual characteristics such as: tendrils of a sweet pea, lines in the petals of a pansy, colours and perfumes of flowers.
   (d) Collect leaves - make simple leaf mounts and prints.
   (e) Collect seeds - note how they are fitted for travel.

B. How Animals are Fitted to Live:
   (a) Reviewing and observing how wild mammals prepare for winter.
   (b) Finding out how other animals prepare for winter: insects, frogs and toads.
   (c) Observing how animals are fitted to secure their food: cow, frog, sparrow and gopher.
   (d) Finding out what various birds eat.

PLANTS AND ANIMALS (Winter)

A. The Resting Period for Plants:
   (a) How trees pass the winter.
   (b) Seeds, bulbs, tubers - rest during winter.
   Plant and care for tulips and other plants during winter.

B. Winter Visitors:
   (a) Watching for winter visitors such as the Bohemian waxwing and chickadee.
   (b) Continue with feeding of winter birds (also the care of domestic birds during the winter).
   (c) Identifying tracks made in the snow by a few common animals.

INTER-RELATIONSHIPS OF LIVING THINGS (Relate to other course topics at appropriate times).

A. Many Factors Affect Plant Life and Growth:
   (a) Plants need water and sunlight.
   (b) Plants need food.
   (c) Plant seeds are spread by animals.
   (d) Bees help fruit trees produce fruit.
   (e) Moths and butterflies use plants for food, shelter, and homes.

B. Some Animals Live Together in a Social Organization for Protection from Enemies and to Secure Food:
   (a) Beavers work together for the good of the group.
   (b) Birds migrate in flocks.
   (c) Deer live in herds.
   (d) Wolves hunt in packs.

C. Birds Help Man in Many Ways:
   (a) Eat weed seeds.
   (b) Eat harmful insects.
   (c) Destroy rodents.
   (d) Provide man with food.

CONSERVATION (Relate to other course topics at appropriate times)

Making Our Surroundings More Beautiful:
   (a) Continue the study of wild flowers and why they should not be picked; ask people in the community about flowers which were once common but are now rare.
   (b) Work with other classes in keeping the school grounds neat and tidy and planting trees and flowers in season.
   (c) Learn to keep picnic grounds clean and undamaged.

MATTER, ENERGY, AND MACHINES

A. Common Fuels:
   Wood, coal, oil, and gas are all the result of work done long ago by the sun.

B. Hotness and Coldness in Relation to Work Done by Heat:
   (a) Learning to measure hotness and coldness by using a Fahrenheit thermometer. (Temperature is the degree of hotness and coldness of things).
   (b) Discovering the uses of thermometers to measure air temperatures, cooking temperatures and fevers of sick persons.
   (c) Heat is a form of energy because it can do work.
      1. Heat expands substances.
      2. Heat travels more easily through some substances than others. Compre conductivity of: iron, wood, water, cloth and air.
      3. Heat is necessary for the evaporation of water, gasoline and coal oil. (Caution - do not do any experiments with gasoline or coal oil).
      4. Heat melts ice, sugar, chewing gum, wax, iron.
      5. Heat makes water boil.
      6. Heat does work.

C. Experimenting with Different Shapes of Magnets to Discover Magnetic Attraction and Repulsion:
   (a) Experimenting to find in what direction a suspended bar magnet comes to rest. (A compass needle is a suspended bar magnet.)
   (b) Additional experiments to discover the laws of magnetic atrraction and repulsion.

D. Learning by Observation How Electricity Helps Us:
   Heat, light, electric motors.

E. Experimenting with Wheels and Pulleys to Show How They Help Us Move and Lift Things Easily:
Using two-pulley arrangement.

THE UNIVERSE, EARTH, AND WEATHER

A. The Sun and Moon:
(a) The Sun shines all the time.
1. Use a globe and a light to show that rotation of the earth causes day and night.
2. The sun shines on us for a longer time in summer than in winter.
3. We get less heat and light from the sun in winter.
(b) The moon shines as a result of the sun's light.
1. The moon is always shaped like a ball and only appears to change.
2. Learn the names and order of the moon's phases.

B. Our Soil:
(a) Soil is broken rock and humus.
(b) Many animals live in the soil.
1. Rodents.
2. Worms.
3. Microscopic animals.
(c) Plants need soil to get food and water.
(d) Bulbs grow best when the soil is carefully mixed.

C. Daily and Seasonal Weather;
(a) Making a pictorial weather record of sunshine, wind, rain and temperature.
(b) Noting that weather changes often.
(c) Weather affects all living things.
(d) Observing how air helps to dry things.
(e) Discovering some uses of air: tires, breathing, kites, airplanes.

PLANTS AND ANIMALS (Spring and Early Summer)

A. How Plants Germinate and Grow:
(a) Find out how seeds (beans and peas) are fitted for germination.
(b) Germinate seeds between moist blotters or in a glass filled with sawdust.
(c) Note conditions for growth: air, light, moisture, warmth. Observe that leaves turn towards sunlight, stems reach up, and roots grow down.
(d) Plan, plant and care for a window box.

B. Flowers and Blossoms:
(a) Identify several new kinds of wild flowers (see appendix).
(b) Observe the environment in which they grow.
(c) Examine flowers of a few broad-leaved trees. Observe the development of fruit tree blossoms and fruits.

C. Increasing Animal Activity:
   (a) Birds:
      1. Recognizing additional birds (see appendix).
      2. Keeping records of returning birds.
      3. Learning the various habitats in which birds live.
   (b) Insects:
      1. Watching for increased insect life with the return of warm weather.
      2. Making a study of the life of an insect such as the housefly.

D. How Animals Survive:
   (a) In order to survive animals must learn to protect themselves from their enemies.
   (b) Find examples of animals protected by: colour, teeth, horns, scales, keen senses of smell and sight, speed in running, quills, claws, and unpleasant odour.

MANITOBA

SCIENCE

Primary Division Grades 1, 2, 3

I - BIRDS (Wild, Domestic)

Nine wild and three domestic birds are to be identified by the end of Grade III. This requirement can be met by studying four per year. Selections will depend upon local conditions and season. The following list is suggested for choice:

WILD: English Sparrow, Robin, Crow, Junco, Goldfinch, Purple Martin, Swallow, Snow Bunting, Horned Lark, King Bird, Oriole, Blackbird, Gull, Chickadee, Canada Jay, Meadow Lark, Humming Bird.

DOMESTIC: Hen, Turkey, Duck, Goose.

II - TREES AND SHRUBS

Ten common trees and shrubs are to be identified by the end of Grade III. The following list is suggested for choice:

Manitoba Maple, White Poplar, Black Poplar, Bur Oak, Elm, Pincherry, Chokecherry, Cranberry, Wild Plum, Saskatoon, Caragan, Lilac, Willow, Currants, Dogwood, Hazel Nut, Rose, Silverberry, Wolfberry, Pine, Spruce, Birch, Cedar.

III - FLOWERS (Wild, Garden)

Nine wild flowers and six garden flowers are to be identified by the end of Grade III. This requirement can be met by studying five per year. Selections will depend upon local conditions and season. The following list is suggested for choice:

Dandelion, Vetch, Buttercup, Marsh Marigold, Rose, Golden Rod, Avens, Indian Paintbrush, Lady Slipper, Violet, Canada Anemone, Prairie Crocus (Purple Anemone) Canada Thistle, Sow Thistle, Aster, Strawberry, Snapdragon, Pansy, Petunia, Marigold, Hollyhock, Sweet Pea, Gladioli, Dahlia.

IV - WEEDS (Field, Garden)

Six common weeds to be identified by the end of Grade III. The following list is suggested for choice:

Dandelion, Lamb's Quarter, Sow Thistle, Canada Thistle, Russian Thistle, Common Plantain, Stinkweed, Knot Weed, Couch Grass, Wild Barley, Wild Millet, Purslane, Shepherd's Purse, Mustards.

V - MAMMALS (Wild, Domestic)

Five wild and three domestic animals to be identified by the end of Grade III. The following list is suggested for choice:

Rabbit, Field Mouse, Flickertail, Striped "Gopher", Grey Ground Squirrel, Weasel, Skunk, Badger, Beaver, Coyote, Timber Wolf, Bear, Fox, Muskrat, Deer.

Horse, Cow, Pig, Sheep, Cat, Dog.

VI - INSECTS

Six insects are to be identified by the end of Grade III. Selections will depend upon local conditions and season. The following list is suggested for choice:

Ant, Butterfly, Mosquito, Moth, Grasshopper, Cricket, Bee, Potato Beetle, Lady Bird, Dragon Fly, House Fly.

VII - OTHER ANIMALS

Three other animals are to be identified by the end of Grade III. The following list is suggested for choice:

Frog, Toad, Snake, Fish, Spider, Earthworm, Turtle, Clam, Snail.

VIII - USEFUL PLANTS (Field, Garden)

Six garden plants and three grains to be identified by the end of Grade III. The following list is suggested for choice.

Garden: Peas, Beans, Carrots, Potatoes, Turnips, Cabbage, Beets, Radish, Onions, Pumpkin, Celery, Lettuce, Corn.

Field: Wheat, Oats, Barley, Flax, Sunflower, Corn.

IX - THE SKY

Informal discussion to develop interest and awareness of the following phenomena:

1. Sun - position of rising and setting in summer and winter, changing shadows.

2. Moon - full moon and new moon.

3. Big Dipper.

X - THE WEATHER

Informal discussion to develop interest in and awareness of the following phenomena:

1. Snow, rain, dew, mist, hail, sleet, clouds.

2. Warm, cold, damp, dry, "stuffy", hot,

3. Fall, winter, spring, summer.

4. Direction of wind - strong, breeze, calm, effects of south and north wind on temperatures.

Junior Division - Grades IV, V, VI

I - BIRDS - Wild

Eighteen birds, including those identified in the Primary Division, are to be studied by the end of Grade VI. These topics should be followed:

1. Identification; 2. Migration; 3. Nesting; 4. Feeding habits and economic importance.

In addition to the list given for the Primary Division, the following list will aid in selection:

Mallard Duck, Blue-winged Teal, Shoveller, Canvas Back, Buffle Head, Canada Goose, Bittern, Great Blue Heron, Coot (Mud Hen), Sandpiper, Killdeer, Ruffed Grouse, Pinnated Grouse, Sharp-tailed Grouse, Owls, Magpie, Blue Jay, Cowbird, Blackbirds, Bronze Grackle, Grosbeaks, Swallows, Waxwings, Cat Bird, Hawks, Bluebird, Hairy Woodpecker, Downy Woodpecker, Flicker, Nighthawk.

II - TREES AND SHRUBS

Eighteen trees and shrubs, including those identified in the Primary Division, are to be studied by the end of Grade VI. These topics should be followed:

1. Identification; 2. Seeds and Fruit; 3. Uses - fuel, shelter, lumber, ornamentation; 4. Seasonal changes.

In addition to the list given for the Primary Division, the following list will aid in selection:

White Pine, Jack Pine, Tamarack, White Spruce, Balsam Fir, White Cedar, Juniper, Ground Cedar, Cottonwood, Mountain Ash, Hawthorn, Mountain Maple, Basswood, Ash, Nannyberry, Meadow Sweet, Raspberry, Gooseberry.

III - FLOWERS (Wild, Garden)

Twenty wild flowers and ten garden flowers, including those identified in the Primary Division, are to be studied by the end of Grade VI. These topics should be followed:

1. Identification.
2. Parts of a plant - root (tap, fibrous) stem (monocotyledon, dicotyledon) leafveins and 5 shapes.
3. Parts of the flower - corolla, petal, calyx, sepal, ovary.
4. Uses - ornamentation, bouquets, nectar for bees.
5. Seed dispersal - (wind, water, explosion, animals, and people).
6. Protecting wild flowers.
7. Beautifying the school grounds.

IV - WEEDS (Garden, Field)

Eighteen weeds, including those identified in the Primary Division, are to be studied by the end of Grade VI. These topics should be followed:

1. Identification.
2. Methods of reproduction - seeds (wind, water, animals), bulbs and corms, runners, underground stems, cuttings.
3. Economic importance.
4. Eradication.

In addition to the list given for the Primary Division, the following list will aid in selection:

Red-root Pigweed, Bindweed, Birdweed, Blue Bur, Chickweed, Cocklebur, Burdock, Fireweed, Ragweed, Dragonhead, Horsetail, Round-leaved Mallow, Leafy Spurge, Nettles, Pepper Grass, Poison Ivy, Toadflax, Wild Oats, Yarrow.

V - MAMMALS (Wild, Domestic)

Ten common wild mammals, including those identified in the Primary Division, and domestic animals found in the district are to be studied by the end of Grade VI. The following topics should be followed:

1. Identification; 2. Habits; 3. Care of Young; 4. Economic Importance; 5. Breeds of Domestic Importance.

VI - INSECTS

Ten insects, including those identified in the Primary Division, are to be studied by the end of Grade VI. These topics should be followed:

1. Identification.
2. Life History - egg, larva, pupa, adult.
3. Economic Importance.
4. Control - crop rotation, chemicals, parasites, animals.

In addition to the list given in the Primary Division, the following list will aid in selection:

Cabbage Butterfly, Monarch Butterfly, Luna Moth, Cecropia Moth, Polyphemus Moth, Miller Moth (Cutworm), Honey Bee, Bumble Bee, Warble Fly, Bot Fly, Blue Bottle.

VII - OTHER ANIMALS

Ten animals, including those identified in the Primary Division, are to be studied by the end of Grade VI. These topics should be followed:

1. Identification.
2. Life history - self-preservation, methods of getting food.
3. Economic Importance.

In addition to the list given for the Primary Division, the following list will aid in selection:

Salamander, Newt, Crayfish, Blood Sucker, Goldfish, Northern Pike (Jackfish).

VIII - USEFUL PLANTS (Field, Garden)

Ten garden vegetables, and four grains, including those identified in the Primary Division, are to be studied by the end of Grade VI. The following topics should be followed:

1. Identification.
2. Annuals, biennials, perenials, winter annuals.
3. Monocotyledons and dicotyledons.
4. Economic Importance.

IX - THE SKY

Continue the study of topics begun in the Primary Division. In addition, the following topics should be discussed by the end of Grade VI:

1. Sun - heat, light, growth, health.
2. Planets - Mercury, Venus, Earth, Mars.
3. Moon - four phases, Harvest Moon.
4. Constellations - Big Dipper, Orion, Cassiopeia, Pleiades, Milky Way.
5. North Star.
6. Meteors (shooting stars).
7. Rotation (day and night).
8. Revolution (seasons).

X - WEATHER

Continue the study of topics begun in the Primary Division. In addition, the following topics should be discussed by the end of Grade VI:

1. Formation of clouds, rain, snow and hail.
2. Formation of dew and frost.
3. Causes of changing temperatures, reading the thermometer.
4. Observing and recording changes in weather.
5. Effects of weather in plants, animals and people.
6. Whirlwinds, tornadoes.

SCIENCE

ONTARIO

GRADE I

Autumn

Naming the flowers in the school garden or from home gardens.
Making bouquets of flowers from the school or home gardens.
Naming the trees in the school grounds.
Telling the class of birds seen gathering to fly South.
Noticing which birds do not leave us.
Examining the winter coats of animals.
Collecting cocoons of various kinds.
Making weather calendars showing sunny days with paper suns.
Keeping a pet at school for a few days.
Modelling twigs of trees with their winter buds.

Winter

Examining snow-flakes with hand lenses.
Examining the frost on the window pane.
Keeping a class weather chart for a month.
Finding three common winter birds and learning what they eat.
Feeding our winter bird friends at school and at home.
Making a sand table winter scene with evergreens, birds, snow, etc.
Finding out what our common animals eat in winter.
Learning to know the four phases of the moon.
Recording the phases of the moon with silver or yellow paper.
Planting paper white narcissi in water.
Observing the bulbs planted in the autumn as they grow in the classroom.
Caring for house plants in pots or window boxes in the classroom.
Learning how to keep healthy in winter.
Caring for goldfish in suitable aquaria in the classroom.
Finding out how goldfish in the aquarium swim and eat.
Observing where the sun rises and sets.
Keeping twigs of fruit trees in water in the classroom.

Spring and Early Summer

Making a classroom bouquet of pussy-willows and pussy-poplars.
Reporting the return of birds in individual record books.
Keeping a class bird calendar.
Colouring bird pictures for each bird recognized.
Finding out who feeds the baby robins and how.
Looking for (not picking) wild spring flowers.
Arranging a few wild flowers in a bouquet.

Studying the buds of trees as they open out.
Identifying flowers grown from bulbs in gardens.
Keeping eggs of frogs or toads in the classroom.
Watching the development of young tadpoles.
Planting a small flower or vegetable garden at home.
Watching how young plants of beans, peas, etc., start to grow.
Assisting in the care of the school and home gardens.
Looking for a friendly toad around the garden.
Trying to find out where it stays when not feeding.
Keeping a chart of the sunny days.

GRADE II

Autumn

Naming the flowers in the school garden or from home gardens.
Making bouquets of flowers from the school or home gardens.
Naming the trees in neighbouring parks or fields.
Tracing the outlines of leaves of maple, oak, elm, beech, etc.
Modelling seeds of maple, beech, oak, etc.
Collecting and naming coloured leaves.
Watching for the first leaves to fall.
Reporting on animals seen storing food for winter.
Watching caterpillars spin their cocoons.
Collecting cocoons of various kinds.
Keeping a blackboard weather calendar.
Describing good homes for pets.
Learning the names of Christmas trees.
Modelling evergreens or making plasticine lay-outs on paper.

Winter

Examining snow-flakes with hand lenses.
Watching how ice forms on a pan of water.
Making individual weather charts for one week.
Finding out how wind helps people.
Reading stories of familiar animals that "sleep" in winter.
Sketching the homes of some common "winter sleepers".
Arranging paper stars to represent the Big Dipper and the North Star.
Planting paper white narcissi in water.
Observing the bulbs planted in the autumn as they grow in the classroom.
Caring for house plants in pots or window boxes.
Learning how to keep healthy in winter.
Talking about some common pets and how to care for them in winter.
Discussing the value of the sun in giving warmth.
Observing how melting snow forms little streams.
Finding buds on trees and watching for the first sign of their changing.
Keeping twigs in water in the classroom.

Spring and Early Summer

Making a classroom bouquet of pussy-willows and pussy-poplars.
Reporting in individual record books the return of birds.
Keeping a class bird calendar.
Learning to recognize a few bird calls.
Arranging a few wild flowers in a bouquet.
Learning to recognize the common wild flowers of the locality.
Keeping up a blackboard calendar entitled "signs of Spring".
Noticing where grass and other plants grow fastest in spring.
Learning to know our common spring flowering shrubs as they bloom.
Finding out which garden plants bloom first.
Learning to know fruit trees by their blossoms.
Watching how earthworms come out at night and withdraw when approached.
Learning to know the garter snake by its markings.
Finding out how it gets its food and where it lives.
Drawing the markings of a garter snake.
Observing different kinds of clouds.

GRADE III

Autumn

Naming the flowers in gardens.
Making bouquets of garden flowers.
Looking for seeds and seed-pods formed by the flowers of garden plants.
Collecting, drying, and storing seeds of garden plants.
Collecting, drying, and mounting a few leaves of trees.
Making bouquets of wild flowers such as asters, golden rod, chicory
Finding seeds that fly: dandelion, milkweed, maple.
Finding seeds that "hitch-hike": burdock, pitch-form, burr.
Telling the story of a seed that went on a journey.
Telling the class of birds seen gathering to fly South.
Making a sketch of wild geese flying South.
Pressing coloured leaves dipped in wax, mounting them.
Making a leaf book.
Noticing whether sunny places have brighter coloured leaves.
Making a collection of coloured pictures of flowers grown from bulbs.
Planting bulbs for winter bloom and caring for them.
Finding out what animals of the locality "go to sleep" for the winter.
Collecting and feeding caterpillars.
Watching caterpillars spin their cocoons.
Preparing boxes for cocoons to be placed outside.
Keeping up a blackboard chart "How Nature Gets Ready for Winter".
Explaining how to feed pets.
Noticing how trees get ready for winter.
Sketching the branching of the elm and the maple.
Modelling the bark of such trees as maple, elm, oak.
Collecting bitter-sweet, cat-tails, etc., for indoor bouquets.
Making cardboard cut-outs of evergreens for sand table scenes.

Winter

Examination of snow-flakes with hand lenses.
Making snow-flake books - white paper.
Discussing the values of snow and ice.
Making a wind vane to tell the direction of the wind.
Finding out the relation between the wind and the weather.
Feeding winter birds at school and at home.
Identifying animal tracks in the snow.
Making sketches of animal tracks.
Discovering the winter homes of animals.
Caring for bulbs planted in the autumn.
Caring for house plants in pots and window boxes.
Finding out which plants like the sun.
Learning how to keep healthy in winter.
Finding out what fruits we get from other lands in winter.
Caring for goldfish in suitable aquaria.
Discovering how fish swim and eat.
Observing the lengthening of the days.
Finding out why snow melts first on southern slopes.
Watching winter buds as they begin to open.
Observing the liquid in the thermometer.

Spring and Early Summer

Making a classroom bouquet of buds.
Reporting the return of the birds - individual records.
Keeping a class bird calendar.
Reporting on observations of birds making nests.
Making bird houses and shelters.
Planning and making bird baths.
Learning to recognize bird calls.
Organizing an Audubon Club.
Finding out which wild flowers should not beppicked.
Arranging a few wild flowers in a bouquet.
Talking about how we may conserve our wild flowers.
Learning to know the common wild flowers.
Watching butterflies and moths emerging from cocoons.
Learning the names of common moths and butterflies.
Keeping eggs of frogs or toads in the classroom.
Studying the development of young tadpoles.
Watching young fruit forming after the bloosoms fall.
Planting a small flower or vegetable garden at home.
Assisting in the care of the school and home gardens.
Watching how earthworms come out at night and withdraw when approached.
Trying to find out how a frog or a toad catches an insect.
Discussing the value of snakes.
Finding out which forest trees have flowers easily seen.
Making a collection of pictures to represent spring.

GRADE IV

Autumn

Identification and removal of weeds on the school grounds.
A nature study excursion through the school grounds.
Recognition of common annual flowering plants in the school garden.
Study of two flowering plants.
Recognition of common trees and shrubs of the roadside, streets, etc.
Recognition of four autumn wild flowers.
Identification of the common grains of the community by kernel and head.
Comparison of good and poor samples of grain, without scoring.
Making a display of common vegetables.
Recognition of two insect enemies and two insect friends.
Study of the feeding and locomotion habits of some common insect.
Finding, identifying, and rearing caterpillars found in gardens.
Study of Nature's need and devices for seed dispersal.
Identifying fruits suitable for bird food.
Collecting and identifying various kinds of autumn fruits.
Collecting and storing flower seeds, gladioli, dahlias, etc.
Finding out why birds go South.
Planting bulbs outside for spring bloom.
Planting bulbs indoors in soil for winter bloom.
Observations of how animals are preparing for winter.

Winter

Examination of snow-flakes.
Drawing of snow-flakes.
Discussion of the effects of frost.
A class bird-feeding project.
Taking a census of winter birds.
January blackboard weather calendar.
Recording the position and time of sunrise and sunset.
Determining the length of each day for a few days.
Measuring and recording the length of the mid-day shadow.
Discussion of the sun as the source of heat.
Discussion of the sources of heat in our homes.
Recognizing the kinds of fuel used in our homes.
Examination of a piece of coal.
The story of a piece of coal from the mine to the home.
How wild animals spend the winter.
Discussion of the winter homes of wild animals.
Study of animals' methods of conserving body heat.
The use of wild animals to man and how we should protect them.
Demonstration of the value of woollens as insulators.
Discovery of how to wash woollens properly.

Spring and Early Summer

Making and decorating a bird calendar on the blackboard.
Discussion of the return of birds from their winter homes.
Keeping of individual observation records of bird activities.

Practising a few calls of common birds until birds respond.
Setting up a bird bath and a bird feeding table (crumbs from lunches).
Holding regular meetings of an Audubon Club.
Recording changes of bird activities as the season advances.
Recognition of flowering bulbs in the school and home gardens.
Making a blackboard calendar of common wild flowers.
Starting garden annuals in pots or boxes in the classroom.
Collecting frog's eggs and watching them hatch.
Making a blackboard calendar in May of all garden flowers in bloom.
Studying the life history of the trillium.
Transplanting young seedlings from flats.
Planning a vegetable garden at school or at home.
Planting and caring for a school or home garden.
Planning summer care of the garden.
Transplanting wood ferns to shady corners in the school grounds.
Learning how to care for a lawn.
Recognition of a few garden plants in the seedling stage.

GRADE V

Autumn

Identification and removal of weeds near the school.
Identification of annuals in the school garden.
Study of two flowering plants not previously studied.
Identification of trees and shrubs of the community.
Individual and classroom calendard of autumn colours of trees.
Study of the habitat and habits of five common weeds not previously studied.
Potting of geraniums, coleus, etc., from the garden for winter bloom.
Making cuttings of geraniums and coleus for the school garden next spring.
Learning to make up a suitable soil mixture for bulbs and indoor plants.
Study of the cabbage butterfly.
Learning how spiders spin webs and how they catch prey.
Setting up a spider home indoors: finding spider's eggs.
Finding out how the animals are getting ready for winter.
Gathering fish, snails, a cla, tadpoles, etc., for a classroom aquarium.
Recognition of five common nut-bearing trees.
Learning to recognize plant foes such as poison ivy.
Recognition of common bulbs by their colour, shape, and size.
Planting bulbs indoors and outdoors.
Keeping a weather chart for Novemoer, noting winds, cloudiness, frosts.
Study of the changes in plants to meet winter.
Finding out why and how trees get rid of their leaves.
Discovering why evergreens do not need to shed their leaves annually.
Recognition of all common local evergreen trees.
How garden plants should be protected for winter.

Winter

Recognition of common trees by their shapes and buds.
Discussion of the value of forests while standing.
Sketching and naming common leafless and evergreen trees.
Keeping twigs of fruit trees and flowering shrubs in water.
Finding cocoons in the bark of apple trees.
Searching for eggs of tent caterpillars on twigs of wild cherry trees.
Observation of how ice forms.
Discussion of the uses of ice to man.
Study of the position of snow drifts.
Study of the moon - its size, distance, motions, and how we see it.
Observation of the moon at successive.hours for one evening.
A blackboard chart of one month's daily observations of the moon.
Drawing the four phases of the moon from personal observations.
Study of water in relation to health.
Discussion of drinks that are good for children.
Explanation of digestion as a process.

Spring and Early Summer

Keeping of individual bird calendars reporting return of birds.
Keeping a blackboard bird calendar.
Discussion of the enemies and protection of birds.
Holding regular meetings of an Audubon Club.
Making individual and blackboard leaf calendars.
Finding the flowers of maple, elm, willow, poplar, oak, etc.
Classifying spring flowers by colour as they bloom.
Making artistic bouquets of garden flowers and of a few wild flowers.
Studying the life history of the dog's-tooth-violet.
Planting garden seeds in flats.
Making a hotbed at the school or home and growing plants in it.
Studying why the trillium dies when the flower is picked.
Making a calendar showing dates of bloom og garden perennials.
Studying the nesting habits of birds.
Finding out how to plant and care for three vegetables.
Recognition and control of two kinds of insects injurious to garden plants.
Learning how to prune roses and shrubs in the school yard or home.
Observations of the work of honey bees visiting spring flowers.
Discussion of the home life of honey bees.
Discussion or demonstration of the hatching of chicks.
Discussion and practice of cultivation of gardens.
Recognition of common flowering shrubs by their size, shape and flowers
Planning summer care of the garden.
Discussion of the relation of sunlight to health of man.

GRADE VI

Autumn

Identification and removal of weeds.
Preparation of the garden for best appearance during autumn.
Keeping the classroom constantly supplied with bouquets of named flowers.
Study of how flowers are fitted to produce seeds.
Study of how climbing plants of the garden are fitted for their mode of life.
Searching in the garden for plants not previously recognized.
Studying the adaptions of the dandelion, plantain, and chickweed for survival.
Study the house fly in its relation to health.
Observations of the habits of ants (an ant colony in the classroom).
Investigating various methods by which animals store food for winter.
Identification of some wild fruit trees or vines that birds feed upon.
Study of the codling moth - life habits, injury to apples, control.
Planting bulbs for indoor and outdoor bloom.
Gathering suitable "everlasting" flowers and plant materials for bouquets.
Preparing the garden for winter.
Making a classroom display of common varieties of fruit, correctly labelled.
Learning how to store fruits and vegetables for winter.
Discussion of how soil is formed.
Keeping a classroom weather chart for December.
Taking a census of bird's nests in a given area.
Planning a bird-feeding project for the winter.

Winter

Recording the amount of snowfall for January on the blackboard.
Calculating the rainfall equal to a heavy fall of snow.
Discussion of how snow aids plant life in winter.
Discussion of enemies of trees and of forests.
Study of methods of forest protection.
Reporting on the value of winter birds.
Protecting and attracting winter birds about the school by feeding them.
Discussion of how birds are adapted to keep warm in winter.
Growing bulbs in soil and water in the classroom.
Finding out how a bulb is fitted to bloom so soon after planting.
Recognition of common house plants in the home and classroom.
Demonstration of how to care for house plants in the classroom.
Making diagrams of familiar constellations at 8.00 p.m.
Observations to show that snow melts earlier on south slopes.
Study of breathing.
Discussion of how germs spread.
Explanation of how germs enter the body.
Discussion of the methods of avoiding infection.
Demonstration of the value of pasteurizing milk.

Spring and Early Summer

Making personal and class bird records.
Erecting bird houses, feeding places, and watering places.
Holding an early morning bird hike.
Forming a Field Naturalists' Club.
Stocking an aquarium with suitable pond life.
Keeping up a class flower calendar of fruit and forest trees.
Making a flower calendar of garden shrubs.
Studying the habits and control of two insects injurious to trees.
Taking a census of wild flowers.
Finding and destroying nests of tent caterpillars.
Finding out how to recognize fruit trees by their bloom.
Planning a garden design.
Starting the plants for this design indoors.
Planning a border along the side of the school yard.
Planting perennials, trees and shrubs and annual plants in the border.
Transplanting suitable shrubs or trees from forests to the school yard.
Studying the life history of the hepatica.
Identification of common butterflies and moths.
Observing the life history of mosquitoes in a pail or ditch water.
Demonstrating the control of mosquitoes by kerosene.
Maintaining a cold frame at the school or home.
Finding out the names, habits, and uses of some common climbing plants.
Recognition of common vegetable seeds.
Planting of a vegetable garden and caring for it.
Planting some flowering "bulbs" such as dahlias, gladioli, etc.
Arranging for the summer care of the school garden and grounds.

QUEBEC

SCIENCE

GRADE I

Prescribed Text: Science with Health and Safety No. 1

The Things God Made in His World.
Unit.1. God Made Animals to Live in His World.
Unit 2. God Made Plants to Live in His World.
Unit 3. God Made Things that Do Not Live.
Unit 4. God Made People to Live in His World.

GRADE II

Preseribed Text: Science with Health and Safety No. 2

God's Laws for his World.
Unit 1. God our Father created a world for us.
Unit 2. God's gift of air.
Unit 3. God's gift of weather.
Unit 4. God's Laws for animals.
Unit 5. God's Laws for the plants.

GRADE III

Prescribed Text: Science with Health and Safety No. 3

Our Gifts from God's World.
Unit 1. God's gift from creation.
Unit 2. Learning about the sky.
Unit 3. God's gift to animals.
Unit 4. God's gifts to plants.
Unit 5. Learning about magnetism.

GRADE IV

Prescribed Text: Science with Health and Safety No. 4

God's Plan for His World.
Unit 1. God's plan for His creatures in His world.
Unit 2. God's plan for plants.
Unit 3. God's plan for animals.
Unit 4. God's plan for our earth in the universe.
Unit 5. God's plan for giving us energy to do our work.

GRADE V

Prescribed Text: Science with Health and Safety No. 5.

Learning More about God's Laws.
Unit 1. God's laws work to form our earth.
Unit 2. God's laws help plants and animals (interdependence - balance).
Unit 3. God's laws work in the sky (air, moon, sun, planets, universe).
Unit 4. God's laws work to give us energy.
Unit 5. God's laws work to give our bodies food.

GRADE VI

Prescribed Text: Science with Health and Safety No. 6

Learning More About God's Gifts.
Unit 1. God's Gifts of Flowers and Trees.
Unit 2. God's Gifts of Birds and Other Wildlife.
Unit 3. The Story of Rocks and Fossils.
Unit 4. God's Gift of Electromagnetism.
Unit 5. God's Gift of the Human Body (the whole person).

NEW BRUNSWICK

SCIENCE

GRADE I

I. LIVING THINGS

1. Needs

a. All animals need food.
Different animals need different kinds of food.
Different kinds of pets must be fed the right kinds of food.

b. Many animals need homes.
Animals make homes to suit their needs.
There are as many kinds of homes as there are kinds of animals.
Different animals build their homes in different places.
Homes are usually made for protection and as a place in which to rear the young.
Different kinds of pets must have different kind of homes to suit their needs.

c. Most plants need air, water, warmth, sunlight and soil.

d. We get our food from plants and animals.

e. Many plants and animals need our protection and care.

2. Distribution

a. Many animals live only above the ground.

b. Many animals live in the soil.

c. Many animals live in water.

d. Many plants live on dry land.

e. Some plants live in water.

3. Adaptations

a. Different animals have different ways of moving about.

b. Most animal parents take care of their young and they do this in different ways.

c. Animals have their own ways of protecting themselves from their enemies.

d. Animals have different ways of getting food.

e. Many trees lose their leaves in the fall.

f. Some plants are protected by their bad taste and some by their thorns or spines.

C. MATTER AND ENERGY

1. Magnets and Magnetism

a. Magnets are bodies that pick up things made of iron and steel.
b. Magnets will not pick up things made of glass, wood, paper, rubber, cloth and some metals.
c. Magnets are not sticky.
d. There are different kinds (shapes) of magnets.
e. The ends of magnets have the greatest pull.
f. The magnet's pull can go through some things.

III. SCIENCE APPLICATIONS IN OUR LIVES - MAN AND HIS ENVIRONMENT

Sub-Areas:

1. Man's Use of Earth's Products

a. We build our houses of the earth's products.
b. We get our food and water from the earth.
c. We make our clothing from the earth's products.

2. Man's Control Over Living Things

a. We can make pets of some animals.
b. We can train pets to do tricks.
c. We can train some animals to do useful work.
d. We must take proper care of each kind of pet and each kind of useful animal because they cannot help themselves when we keep them penned up.
e. We can help plants to grow better.

II. THE PHYSICAL PHASE OF THE CHILD'S NATURAL ENVIRONMENT

A. THE EARTH

1. Air

a. Air is everywhere around us but we cannot see it.
b. Air moves things. Moving air pushes against things.
c. We can feel the air move. Wind is moving air.
d. We need air to breathe.
e. We can put air in some things.

2. Water

a. We use water in many ways for example, drinking, bathing, watering plants, cooking.
b. All plants and animals need water in order to live.
c. Many different kinds of animals live in water.
d. Some plants live and grow in water.
e. Some things float in water, others sink.
f. We should wear rubbers and raincoats when we go out in the rain.
g. Water can be dangerous. We must be careful when playing near water.

3. Rocks and Minerals

a. Rocks are different in many ways: many rocks are big and many are small, some rocks are hard and some are soft, some rocks feel smooth and others feel rough.
b. Rocks have many different colours.
c. Rocks are used by man in many ways.

B. THE SKY ABOVE

1. Stars

a. We see many stars in the sky every clear night.
b. Some stars are brighter than others.
c. There is one star that we can see in the daytime.

C. MATTER AND ENERGY

1. Light

a. Most of our light comes from the sun.
b. We can get light by burning things.
c. Light cannot pass through some things. It can pass through other things easily and through still other things less easily.
d. Plants need sunlight in order to live and grow.
e. We cannot see in the dark.

GRADE III

I. LIVING THINGS

1. Needs

a. Animals need plants for food.
b. Some animals need to store food for winter.
c. Many plants need leaves in which to make their food.
d. Green plants need sunlight in order to make food.

2. Distribution

a. Life is all around us; here, there and everywhere.
b. Some living things live on the land while others live in the water.
c. Different kinds of animals live in different places in a community.
d. Different kinds of plants live in different types of environment.
e. Each kind of animal and each kind of plant live in a place best suited to it.

3. Adaptations

a. Many animals migrate: as adaptation to change in seasons, as a part of the normal life cycle.
b. Some animals hibernate; they pass the winter by resting or sleeping; they are inactive.
c. Some animals live and work together in groups.
d. The bodies of animals are adapted to the way the animals live.
e. Colour is the protection of some animals.
f. Some plants die when winter comes.
g. Some plants live through the winter.
h. Plants do not grow during winter's cold.
i. Trees and other green plants grow toward the sunlight.
j. The seeds of plants are scattered in many ways.
k. Trees change in appearance with every season.
l. People often have to change their activities because of weather.

4. Growth

a. Most of the plants that we know grow from seeds.
b. There is a tiny plant in each seed and it grows first on the food stored in the seed with it.
c. Roots of the new plant grow from the seed before the leaves grow.
d. Some animals become full-grown more quickly than others.
e. We must care for our plants and animals properly if they are to grow properly and keep healthy.

C. MATTER AND ENERGY

1. Magnets and Magnetism

a. If we have a magnet, we can make more magnets. (Magnets can be made by rubbing pieces of iron or steel with another magnet).
b. All kinds of magnets are strongest at the ends. The ends of a magnet are called its poles.
c. A magnet will attract from some distances.
d. Some magnets are stronger than others.
e. If a magnet is suspended, it will always point in the same direction.
f. One end of a magnet is marked N and the other end is marked S.
g. Magnets act toward each other in a special way. (Law of the magnet). (Significance of the north-seeking pole and south-seeking pole).

2. Heat

a. Heat from the sun warms the earth.
b. Heat comes from many sources: from fire (from many fuels), electricity makes heat, rubbing one's hands together makes heat.
c. Fire and heat help us in many ways: heat is one of man's most necessary servants.
d. Fire and heat can be harmful to us.
e. Heat causes things to change.
f. Heat drives air out of water.
g. Heat changes water to steam.
h. Warm air takes up more space than cold air.
i. Heat can be measured; heat is measured with a thermometer.
j. We can tell for sure that today is warmer or colder than yesterday or that one room is warmer or colder than another room.
k. The coloured "line" in the centre of the thermometer moves up and down.
l. The numbers on the thermometer have a meaning.
m. The amount of heat present makes great differences in our lives and in the things going on about us.
n. There have been many legends and myths about the origin of fire.

3. Matter

a. The earth consists of three main parts: the solid part, the liquid part and the gaseous part. The solid part of the earth is the land. The liquid part of the earth is made up of water which froms rivers, lakes and oceans. The gaseous part of the earth is the air.

2. Man's Control Over Living Things

a. Man uses animals for work and pleasure.
b. Man uses plants and animals for food, shelter and clothing.
c. Man grows some plants for pleasure.
d. Man uses plants and animals to obtain products that he needs.
e. Each kind of plant and animal, wild and domesticated, has certain needs that must be provided if it is to survive.
f. Man must understand the needs of his plants and animals in order to care for them properly.
g. Man can control useless or harmful plants and can improve conditions for the growth of useful plants.
h. Man destroys insects that are harmful to him, to his plants, to his animals and to his home.

4. Reproduction

a. Animals have different numbers of young.
b. Many animals lay eggs which hatch into young animals.
c. Some animals take good care of their young while other animals take little or no care of their young.
d. Most plants produce many seeds from which new plants will grow.
e. Not all seeds produced by a plant make new plants.
f. Seeds will grow into the same kinds of plants as those from which they come.
g. Parts of some plants will form new plants.

5. Interdependence

a. Man uses plants and animals in many ways - for example, for food, clothing, plant and animal products for shelter, to do work and to make surroundings more beautiful and life more pleasant.
b. Some animals carry seeds from the mother plant.
c. Birds are the greatest protectors of plants.
d. Many animals depend upon plants to protect them.
e. Some insects, bees for example, and flowers are like partners.
f. Many plants cannot grow in the hot sun and are protected by the shade of taller plants.
g. A few plants catch and eat insects and other tiny animals.

II. THE PHYSICAL PHASE OF THE CHILD'S NATURAL ENVIRONMENT

A. THE EARTH

1. Air

a. Air is everywhere about us all of the time; it is in the soil and in the water too.
b. Many spaces that we think of as empty are filled with air.
c. When air fills a space it may keep some other things out of the space.
d. Air is always moving, sometimes very fast, sometimes to slowly that we do not think it is moving.
e. Wind blows from many different directions.
f. Air may be hot or cold. The thermometer tells us how hot or cold the air is.
g. Water disappears into the air from many places.
h. Sometimes there is more water than the air can hold; then the water comes out of the air and we can see it.

d. There is a white path, called the Milky Way, across the night sky. It is made up of so many stars which are so far away that we cannot see them separately.
e. Groups of stars that form imaginary patterns or pictures we call constellations.
f. The people of ancient times made up stories about the pictures which they thought they could see in the constellations.
g. The North Star helps us tell directions.
h. Stars have always helped travellers, especially sailors, find and keep their direction.
i. People have always been interested in stars. This is shown by the many stories and poems written about the stars.

C. MATTER AND ENERGY

1. Light

a. Most of our light comes from the sun.
b. Many kinds of materials give off light if they get hot enough.
c. Some objects reflect light.
d. Great improvements have been made in lighting our homes and the buildings where we work.
e. Plant stems and leaves will grow towards the light.
f. We must know how to get good light for seeing in order not to over-work or injure our eyes.

2. Gravity

a. Things are not able to leave the earth because the earth pulls on everything.
b. Things fall down, not up, because the earth has power to pull things to it. Things will always fall from higher places to lower places.
c. The earth's pull helps us to do many things in our play.
d. We use the earth's pull on the farm, in our homes, building roads.
e. Unless we are very careful, we can be hurt by the pull of the earth.

3. Electricity

a. Electricity helps us: used for lighting, used for cooking, used to spread the news in radio and TV, runs machines, used in sending messages.
b. Electricity travels along wires which are made of metal.
c. The metal wires along which electricity travels are covered with cloth, rubber, wax, etc., so that the electricity cannot give shocks or start fires.

f. There are many ways to practice safety on the farm.
g. We can get too much hot sunshine.
h. There are common sense behaviors in our associations with animals; not bothering pets while they are eating, avoiding and not teasing animals known to be unfriendly, riding or driving a horse only if you know how, standing out of reach of animals at a zoo, keeping windows and doors well screened against flies and destroying their breeding places.

3. Conservation

a. Man depends upon the soil for food, clothing and shelter.
b. Plants keep the wind from blowing the soil away and water from washing it away.
c. Wild flowers and plants of any kinds should be picked carefully and sparingly or not at all.
d. We should not dump garbage, sewage or waste of any kind into our streams and rivers.
e. We should protect all kinds of wild animals in the natural homes that remain for them.
f. There are "good manners" to be observed when in the forest.

4. Growth

a. Flowers of green plants produce seeds.
b. Plants change as they grow.
c. Most plants grow rapidly when they have moist air, damp soil and sunlight.
d. Animals change as they grow.

5. How They Are Improved

a. Both plants and animals can be improved by providing them with the proper foods and proper amounts of clean water.
b. Living things can be improved through control
b of their environments.
c. Man develops new varieties of plants because they are of greater value to him.
d. Living things can be improved by cross-breeding.
e. Living things can be improved by selection.

II. THE PHYSICAL PHASE OF THE CHILD'S NATURAL ENVIRONMENT

A. THE EARTH

a. Soil is largely a loose mixture of broken rock which contains some humus, water and air.
b. There are different kinds or types of soil.
c. Some kinds of soil hold water better than other kinds.
d. The rocks of which soil is made were themselves made in different ways.
e. Rocks have helped us to learn about early life on the earth.
f. Some changes in the earth's surface occur very slowly while others occur rapidly.
g. Erosion is largely responsible for soil formation and today is responsible for great soil losses.
h. Soil erosion is robbing the people of land.
i. Many ways of preventing or checking soil erosion are being discovered and put to use by man in his attempt to conserve the soil.
j. Some soils are better for growing plants than others.

B. THE SKY ABOVE

a. The sun, like all other stars, is made of hot, glowing gases.
b. The sun looks small because it is a very long way from the earth.
c. The sun is only a medium-sized star but is very large in comparison with the earth.
d. The sun is shining on one-half of the earth all of the time.

2. Heat

a. The sun is our greatest source of heat.
b. There are many different sources of heat. Heat from each of these sources does various things for us.
c. Pounding and rubbing produce heat.
d. Heat raises the temperature of water.
e. Heat drives air out of water and changes the taste of the water.
f. Heated water is pushed upward by colder water.
g. Heat vaporizes water.
h. Heat causes most materials to expand; heat causes water and other liquids to expand; heat causes m metals to expand; heat causes air to expand.
i. Some metals carry heat better than other metals do.
j. Heat is carried better by metals than by many other materials.
k. Air conveys heat. Warm air travels upward.
l. To start a fire, fuel must be heated to its kindling point.
m. Fire needs air to burn.
n. As we realize our dependence upon fire, we must give more thought to conserving all fuels that make fire possible.
o. Most destructive fires are preventable.
p. Everyone should respect the forest fire laws.
q. Spontaneous combustion is a kind of combustion that starts a fire without a match.
r. There is a definite temperature at which ice melts.
s. There is a definite temperature at which water freezes.

3. Matter

a. Every kind of material has characteristics that tell us what the material is like; each has its own characteristics.
b. The characteristics of a material determine how we use it.
c. There are safety rules for handling materials.
d. Everything in the world exists as a solid, liquid or gas.
e. A solid has a definite shape and a definite size.
f. Liquids have no shape of their own; they are capable of flowing, can be poured and take the shape of the container into which they are poured.
g. Gases spread out or flow in every direction; they have no size or shape but spread out until they fill all the space into which they can spread.
h. One form of matter may be changed to another form by heating or cooling.

2. Man's Control Over Living Things

a. Many plants and animals have been domesticated by man.
b. Domesticated plants and animals have different needs from wild plants and animals.
c. Man has improved plants and animals so that they give him more and better food, clothing and shelter.
d. New varieties of plants and new breeds of animals have been produced.
e. Domestic plants and animals are completely at the mercy of their owners.
f. Man can control harmful insects and other animal pests.
g. Man can control weeds.
h. Man can control some bacteria.
i. Man controls the growth of plants.

4. Reproduction

a. Each living thing produces its own kind.
b. Many young animals are born alive.
c. Many different kinds of animals lay eggs which hatch into young animals.
d. Different animals which guard and care for their young do so in different ways, some more carefully than others.
e. Those animals which have only a few young take more care of them than those which have many young.
f. Each flower is composed of different parts.
g. The flower produces a fruit containing a seed or seeds.
h. Each seed contains a tiny plant.
i. Seeds will germinate and grow into plants when they have the right conditions.
j. Many of the plants that produce seeds may start new plants from roots, stems, leaves of bulbs.
k. Ferns and mushrooms have no flowers but reproduce by spores.
l. Some plants must be reproduced each year; other plants live and grow year after year but they need seeds just the same.
m. Whenever a new plant is made, some part of an old plant of the same kind is used.

5. Interdependence

a. Plants and animals are used to make many useful products; paper, dyes, medicines, fertilizers, etc.
b. Social animals live and work together in a colony to stay alive.
c. Some animals form groups so that they can capture food more easily.
d. Some animals help each other by joining together to fight an enemy or by giving warning signals.
e. Some animals live together in groups at some times and not at other times.
f. All animals, whether they use plants for food or eat other animals, could not live if there were no plants.
g. Plants need decayed animal and plant matter from which to make food. All plants help other plants to get food. Some plants are not green. These plants cannot make their own food so they use dead and decayed plants as food. Mushrooms, puffballs and molds belong to this group.
h. In being helpful many plants and animals are injured or destroyed.
i. The numbers of each kind of plant and animal remain about the same from year to year.

g. It is very unusual to get water that does not contain other substances because water dissolves many things.
   - some things dissolve in water more readily than others.
   - most things dissolve better in hot water than in cold water.
   - dissolved substances can be removed from water.

h. Things dissolved in water will go through a filter.

i. Things that are not dissolved in water but are just mixed with the water will not go through a filter.

j. Water often has many minerals dissolved in it; water that has minerals dissolved in it is called "hard water". Rain water is soft.

k. Soap lathers more easily in soft water.

l. Water that soaks into the ground is useful.

m. Water passes through some kinds of soil more rapidly than through other kinds of soil.

n. In dry weather some of the water that had soaked downward into the soil may move upward again.

o. Water expands and gets lighter in weight when heated.

p. Water expands when it freezes.

q. Running water is always changing the earth by wearing down rocks, carrying away the soil and perhaps causing floods.

r. Water is so important in our lives that we must take care to conserve it in order to ensure an adequate supply for our needs and industry.

s. Water supplies are sometimes ruined by pollution.

t. There are different ways of purifying swimming-pool water and drinking water.

3. Rocks and Minerals

a. Rocks differ in colour, shape, hardness and other characteristics.

b. Natural rocks and rock products are used for many purposes.

c. Artificial rocks, such as concrete and plaster, are made from materials obtained from natural rocks.

d. Rocks are continually being worn away by weathering, stream action, abrasion and other agencies.

e. Soil is made up largely of rock particles.

f. Rocks tell the story of the earth before there were any people on earth.

g. Rocks have helped us to learn about early life on earth.

h. There are three classes of rocks according to how they were formed or made:

   i. The oldest or first rocks, made when very hot gases and liquids turned solid as they cooled, are called igneous or fire rocks. Granite and basalt are examples.

i. The galaxy of which we are a part is arranged in space in the form of a disc.
j. The telescope has helped man to discover many stars and also many galaxies far out in space beyond our galaxy.
k. Some of the brightest stars, the morning and evening stars, are not stars at all.

2. Solar System

a. The sun and the bodies which travel around it in space make up the sun's family or solar system.
b. Scientists think that the earth and the other planets were once a part of the sun.
c. The solar system includes six kinds of heavenly bodies; the sun itself, nine known planets of which the earth is one, moons which revolve about some of the planets, planetoids, meteors and comets.
d. The sun is made up of hot gases and gives off both light and heat.
e. The sun is an average-sized star but it gives more light and heat to us than any of the many other stars because it is closest to the earth.
f. The sun is only a middle-sized star yet is is much larger than all of the nine known planets put together.
g. The sun can be used to tell the time of day.
h. The sun does not follow the same path across the sky from day to day. Its winter path is shorter and farther to the south than its summer path.
i. Planets are not stars but are dark bodies that shine by reflecting the sunlight that strikes them. The nine known planets are very different from the stars.
j. Planets differ from each other in size and distance from the sun.
k. Conditions on the planets are dependent largely upon the heat and light they receive from the sun and on most planets these conditions are not suited to life.
l. Some of the planets have moons.
m. The planets with their moons are moving around the sun at rapid speeds each in its own path or orbit.
n. Planetoids, meteors and comets are interesting members of the solary system.

C. MATTER AND ENERGY

1. Light

a. Some objects product light directly.
- most of our light comes from the sun;
- we can get light by burning fuels;
- we can get light from electricity.

f. A switch or push button is used to break or close a circuit.
g. Some things conduct electricity better than other things. Copper, steel and iron are good conductors while paper, glass, air, cloth and rubber are poor conductors but good insulators.
h. Electric wires must be insulated.
i. Fuses are safety devices that protect our homes.
j. Electricity always travels along the shortest path it can find.
k. A short circuit occurs when electricity travels through the wrong pathway and so causes electrical appliances not to work.
l. Static or frictional electricity is made by friction between two substances.
m. We need not fear lightning if we know and follow a few simple rules to protect ourselves from it.
n. Dry cells make or produce electricity only when a complete path is provided along which the electricity can travel.
o. Dry cells are no storehouses of electricity.
p. Dry cells are used in various places.
q. A wet cell can be made in the classroom.
r. An electromagnet is a magnet only when electricity is running through it.
s. An electromagnet is a special kinds of magnet made by using electricity.
t. Man makes many uses of electromagnets.
u. Many electric things which we use today work because there is an electromagnet inside them.
v. A person's body can be a path for electricity; this is why each of us should know how to use electricity safely. We must know and obey the safety rules for using electrical appliances.
w. Many men have made contributions to our knowledge and use of electricity.

4. Matter

a. Matter is found in different forms.
   - a solid has and keeps a definite shape and size;
   - a liquid has a definite size which it keeps but its shape changes to fit the shape of the container which holds it;
   - a gas has no definite size or shape of its own.
b. Each of the thousands and thousands of things in the world is made of chemicals.
   - the elements are the materials or chemicals in nature that cannot be separated into other substances;
   - some of the elements exist in nature in pure form but most of the elements join together or combine to form new and different materials called compounds. Compounds are chemicals made of two or more elements.

c. Machines are devices that make work easier. There are four kinds of simple machines.
   - wheels help us to move things about more easily;
   - a pulley can be used to move an object to a certain place. A fixed pulley makes it possible to pull in one direction and move a weight in the opposite direction. A movable pulley makes it easier to life a weight.
   - levers are used to lift things.
   - a weight can be pushed up an inclined plane easier than it can be lifted. We use wedges, which are really two inclined planes, to split things apart.

d. In our homes we use many machines run by hand.

e. Electricity is a convenient source of power.
   - our electrical current may come from several sources;2
   - many useful devices are run by electric motors.

f. Electricity gives us heat and light.

g. Machines can harm us as well as help us.

h. Friction, rubbing together of two surfaces, tends to stop moving objects.

i. Friction is extremely important in our lives.

j. When friction is undesirable, it can be reduced by means of wheels, by lubrication, and by using smooth surfaces.

k. When friction is desirable, it may be increased by making surfaces rougher.

2. Safety

a. We need to practise safe ways of moving about in traffic everywhere. Where there are rules in force, we must know and obey them.

b. Whether you are running or riding a bicycle, it is most important that you know about stopping distance.

c. We need to practise safety when we go into the water or go boating.

d. Tools and machines have hazards of which we must be careful.

e. Because electricity causes shock when it passes through our bodies and because it produces heat, there are many hazards to be avoided in its use.

f. There are many cautions to observe if we are to prevent fires in buildings and in the forest.

g. We should take precautions to avoid seasonal weather hazards such as fog, lightning, hurricanes, ice, over-exposure to the cold or sun. We can afford to develop respect for weather reports.

NOVA SCOTIA

SCIENCE

GRADE I

ANIMALS

Suggested Concepts

Mammals

Animals are adapted in different ways for getting their food.
Some animals live on the farm while others live in the forest.
All baby mammals have to be cared for by their parents, and get milk from their mothers.
Mammals are useful to man for the work they do, the food they provide and the products that are made from them.

Fish

Fish must live in water.
Some fish live in very cold water through the winter.
Fish find their food in water.
Fish use their tails and fins to help them to swim.
Fish are useful to man for the food they provide.

Frogs and Toads

Frogs and toads are much alike.
Frogs' eggs are laid in pond water in a cluster, while toads' eggs are laid in a string.
Frogs take longer to grow than toads.

THE EARTH

Suggested Concepts

Earth

The earth is very large.
The earth is made of land, water and air.
The earth is round.
The earth moves all the time and moves fast.

Land

We live on the land.
Land is made up of rocks and soil.
Rocks may be large or small, rough or smooth, hard or soft.
Rocks are useful to men.
Soil is made from rocks that have been broken up, as well as the decayed remains of plants and animals.
There are different kinds of soil.
Plants grow well in some soils but poorly in others.
Soil is not the same as dirt.

GRADE II

ANIMALS

Suggested Concepts

Insects

Insects have six legs and two feelers.
Some insects are: ants, bees, mosquitoes, flies, grasshoppers, crickets, moths, butterflies, ladybugs.
Most insects have wings.
The wings of insects differ from the wings of birds (thin, transparent, unfeathered).
Spiders are not insects; they have eight legs.
Bees use their long tongues to get sweet water (nectar) from flowers. From the nectar they make honey.
Mosquitoes lay eggs in water.
Grasshoppers lay eggs in the ground in autumn and then die. The eggs do not hatch until spring.
Ladybugs help us by eating insects that harm our fruit trees.
Caterpillars spin around themselves coooons from which they emerge as butterflies or moths. The butterflies and moths lay eggs from which caterpillars hatch.
Flies spread diseases by carrying germs.

THE EARTH

Water

Suggested Concepts

Most of our earth is covered with water.
Plants and animals cannot live without water.
Water can be changed into steam.
Clouds are made of water.
Steam and ice are forms of water.
Water in the air can form rain, dew, fog, etc.
Water evaporates into the air.
Water is useful in many ways.
Water is harmful in some ways.

THE SKY

Moon

Suggested Concepts

The moon gives us light.
The moon does not always look the same.
The moon is smaller than the earth and much smaller than the sun.
The moon is solid like the earth.
The moon has no air, water or people upon it.

GRADE III

ANIMALS

Birds

Suggested Concepts

Birds have feathers, two wings and two legs.
Birds hatch from eggs.
Birds build nests to raise families.
Birds eat many seeds and also scatter them.
Birds eat harmful insects, worms and small animals that might destroy our cops.
Some birds use their feet to catch animals; other use their bills to obtain food.
We should feed birds in winter.
Seeds, suet and nuts are good foods for winter birds.
Some of the birds commonly seen in Nova Scotia are robins, song sparrows, crows, pigeon, English sparrows, bluejays, bronzed grackles, downy woodpeckers, flickers, warblers, goldfinches, black-capped chickadees, juncos.
Some birds that live on the farm are chickens, ducks, geese, turkeys.

THE EARTH

The Air

Suggested Concepts

Air is everywhere.
We need air to live and breathe.
There is water in the air.
The wind is moving air.
Winds help people in some ways.
Winds harm people in some ways.
Fire needs air in order to burn.
Air pushes against things.
Air may be hot or cold.
Warm air rises.

THE SKY

Stars

Suggested Concepts

Stars give us light.
There are many, many stars.
Stars are far, far away.
The stars make pictures in the sky.
Stars vary in size, colour and brightness.

GRADE IV

ANIMAL AND PLANT COMMUNITIES

Animals that live in herds (buffalo, elephants, seals, etc.)
Animals that hunt together (foxes, coyotes, pelicans, etc.)
Swarms, schools and colonies (grasshoppers, ants, mosquitoes, beavers, etc.)
City dwellers (termites, ants, prairie dogs, etc.)
Long distance travellers (goats, birds, etc.)
Plant communities poplar, pine, spruce, banyan)
Advantages of living in groups:
  Protection from enemies
  Providing of food supply.

PLANTS AND ANIMALS OF THE PAST

Animals of the tar pits (buffalo, camel, ground sloth, etc.)
Early animals of the Western Plains (dinosaurs)
The story of the rocks (fossils, etc.)
The era of ancient life
The era of middle life
The era of recent life.

ELECTRICITY

Lightning and thunder
Making lightning (static electricity, Franklin's kite experiment - emphasize its danger)
Getting electricity by rubbing
Experiments with electricity
Electric cells and batteries
Electricity from generators
Pathways for electricity.

LIGHT

Seeing things with light
The story of light
Light from electricity
Experimenting with rays of light.

THE MOON

Motions of the moon (rotation, movement around the earth)
Phases of the moon (new, first quarter, last quarter, full)
Eclipses of the sun and moon
Conditions on the moon
Tides
Moon signs and stories.

GRADE V

PLANTS AND THEIR FOOD

Green plants: abundant almost everywhere on the earth and in the sea; requirements for life: water, air, light, minerals and proper temperature.
Experiments with green plants to show how they get food.
Green factories (Introduce idea of mdecules, plant cells, chlorophyll, stomata, manufacture of plant starch).
Plants that eat animals; pitcher plant, sundew, Venus' flytrap
Non-green plants: mushrooms, moulds, yeasts, bacteria.

TIME AND SEASONS

The changing seasons: reaction of different plants to seasons; animals' actions to survive during different seasons.
Causes of the seasons (experiments).
Measuring time: shadows and sundial, water clocks, watches and clocks.
Time zones.

CHANGES ALL AROUND US

The limestone cave: formation of stalactites and stalagmites.
Rocks and minerals: igneous, sedimentary and metamorphic rocks.
The Wonderland of Chemistry (a story to show the importance of chemistry in the manufacture of common products).
Elements, compounds and mixtures (several simple experiments)
Solids, liquids and gases.

AIR

The ocean of air; sea and air compared
Air pressure and its uses
Gases in the air
Air and health
Wind: warm air rises and cold air takes its place; sea breezes and land breezes.
Airplanes and airships
Exploring the upper air.

THE SOLAR SYSTEM

The sun's family; what the sun gives the earth, the composition of the sun; names of the nine planets.
The inner planets; why they shine; composition of the earth's surrounding medium
The outer planets
Meteors and comets.

GRADE VI

FOOD FOR GROWTH AND ENERGY

Animals and their food: different ways in which food is obtained by cows, horses, ants, woodpeckers, bats, racoons, kingfishers, gulls, clams, amoebae, etc.; man and his food.
Useful substances in foods: proteins, carbohydrates, fats, vitamins, minerals, water; uses of each
Digestion and distribution of foods; alimentary canal, cells, arteries, veins, heart, capillary tubes.
Food as fuel: comparison of body with steam engine; muscles and their action; temperature of body and its control in relationtto food as fuel.
Cells and growth; three kinds of growth.

WEATHER AND CLIMATE

Measuring air changes: thermometer, barometer, anemometer, wind vanes, sounding balloons.
Forecasting without instruments; four main types of cloud (Keep a chart of weather and appearance of cirrus, stratus, nimbus and cumulus clouds.)
Air masses and precipitation: fronts, movement of air, experiments to show formation of clouds, rain, mist, hail, sleet, snow.
Stormy weather: highs, lows, whirlwind or tornado, hurricanes or typhoons, floods, snowstorms, fog.
Climate: different zones; trees as evidence of drought periods in the past.

ELECTRICITY AND ITS USES

Electromagnets: making and using a magnet; use of electromagnets to move steel.
Using electromagnets to send messages: keys and sounders; telephones.
Electricity for heat and light, toasters, etc.; Edison's work.
Turbines and motors (experiment)
The Science Fair: exhibits and projects on electricity (experiments)

THE WORLD OF SOUND

Vibrations in the air: use of cannon to relay signals; illustrations of the speed of sound; experiments to show the nature of sound (elastic, tuning forks, water, waves, saw).
How sounds differ: violin, spokes of bicycle wheel and paper - changed speed causing change of pitch; relation of sound to number of vibrations; tension of wires in piano.
Experiments: nails on board; water in test tubes; sounding boards; different kinds of instruments; vocal chords.
How sound travels: experiments to show the different sound-carrying ability of wood, water, air; echoes, sounding of ocean depths.
How sounds are heards: the ear

SCIENCE

Prince Edward Island

Outline for Grades I and II

AUTUMN

Plant Life:

Recognition of at least six September garden flowers (nasturtium, sweet pea, aster, marigold, dahlia, etc.) and at least six late-blossoming wild flowers (aster, goldenrod, fall dandelion, thistle, milkweed, etc.)

Recognition of at least six fruits and six common trees.

Collect leaves and press them. Notice the beauty of the colored leaves. Draw them and try to color the drawings like the leaves.

Notice which leaves fall first; which leaves do not fall at all.

Crops - vegetables, grains, fruits. Learn how we use them. Make drawings and models. Color some of these. Make cut-outs.

Animals, Birds and Insect Life:

Watch grasshoppers, spiders, crickets and ants. Try to find out where they live, what they eat, and how they spend their time. Do they help us in any way?

Notice earth worms after a rain. Where do they come from? How do they move? What use are they to us?

Bring in caterpillars. See how many different kinds you can find. Keep some in suitable boxes or bottles. Watch the making of cocoons.

Make drawings of them. What will come out of the cocoons?

Learn about a few harmful insects and how we may fight them.

Notice the same of the birds seen in the summer are no longer around. Where have they gone? Why?

Name some of the birds that have gone; some that remain. See if you can notice just when some of them are no longer to be seen.

Outline for Grades I and II

SPRING

Plant Life:

Pussy willows. Bring some in and keep them in water. Watch their development. Make drawings.

Swelling buds. Watch how they break into leaves.

"Sap's running!" Making maple sugar.

Different kinds of roots - fibrous and tap.

Spring flowers - the mayflower, violet, trillium, etc. Why should we not pick too many? Draw some.

Later flowers - dandelion, buttercup, daisy, clover, etc. Make drawings.

Work in the school garden or home plot where operated.

How seeds sprout and plants grow. Plant a bean and watch it.

Weeds. Learn to know some of the worst ones. How may we get rid of them?

Animal, Bird and Insect Life:

The "Spring Chorus" - frogs and toads.

Gather frogs' eggs. Watch the development of the tadpoles. (It is easy to keep these in the school room).

Fish. How do they breathe and swim? Learn to recognize several salt water and several fresh water fish. Watch jelly fish swim.

Returning birds. How many different ones can you recognize?

Birds' songs. Listen for them. Learn to recognize some of the birds by their songs.

Birds' nests. Examine some. See how they are built, but be careful not to disturb them. If possible watch a nest and see when the eggs hatch.

How do birds help us?

Spring Weather:

The importance of sunlight to plants.

The rainbow. What is it? What are its colors? Make drawings. Rain clouds How they are formed. What does the rain do for us?

What does it do for plants?

Outline for Grades III - IV

AUTUMN

Plant Life:

Collect bouquets of common fall flowers for the classroom. Observe and discuss their colors, odors, where they grow. How many colors can be found in each flower? How many different colored flowers can be found?

Arrange a fall flower of garden flowers brought in by the pupils. Identify at least six familiar garden flowers.

Observe harvest activities. Prepare a harvest sandtable. Model and draw fruits and vegetables. Make a Thanksgiving poster.

Learn the main parts of plants - roots, stems, leaves, trunks, branches, flowers. What do plants need to grow?

How do wild flowers prepare for winter? Notice formation and distribution of seeds. How does man prepare the garden for winter.

Learn to recognize at least six trees in your district.

Animal, Bird and Insect Life:

How animals prepare for winter. What animals grow heavier coats?

Note the horse, cow, rabbit, weasel, squirrel, chipmunk, bear. Observe changes in the color of weasels and rabbits. What is the advantage of this?

Insects. Collect a few caterpillars and observe the formation of cocoons. What do caterpillars eat? Where do they live during the winter?

Autumn Weather:

Observe where the sun rises and sets. What is the difference between day and night. Observe the changes in length of day and night.

Discuss different kinds of weather - cloudy, dull, rainy, windy, bright, warm, cool, cold.

Bird Life:

Learn the names of at least three common winter birds. Set up a simple feeding station for winter birds at home or at school. Select one bird for special study.

Winter Weather:

What is wind? How can you tell the wind is blowing? What effect has the wind on snow? Why do we put snow fences along roads? Which winds bring cold weather? Keep records of the direction of the wind.

Outline for Grades III - IV

SPRING

Plant Life:

Observe pussy willows, swelling buds, new leaves, and flowers on trees. Notice which trees grow green first.

Identify and learn to recognize the more common garden and wild flowers. Keep a flower calendar. Preserve it to compare with those of other years.

With beans or quick-germinating seeds, experiment to show that young plants need good soil, warmth, sunshine and moisture to grow.

How do farmers get their farms ready in the spring? Have a school garden plot or window box.

Sowing seeds. When and how to plant different kinds.

Animal, Bird and Insect Life:

Look for returning birds. Learn to recognize at least three new bird friends. Can you name them by their sounds? Try to imitate their songs. Keep a bird picture gallery, posting a picture of each bird as its return is noted. Teach consideration for birds' nests and eggs.

Tadpoles, frogs and toads. Their growth, habits and food. How do toads and earthworms help us in the garden?

Observe the cocoons that were collected in the fall. Look for moths and butterflies. Learn to recognize two or three showy ones.

Spring Weather:

Discuss how the change of length of day and increased heat from the sun affects plants, animals, and people.

Observe that spring rains help our farms, gardens and trees. Note the position of the sun when there is a rainbow. Draw a picture of a rainbow that has been observed.

Outline for Grades V and VI

WINTER

Animal Life:

Fur bearing animals - mink, muskrat, fox, raccoon, etc. Their habits. Why are they usually trapped in the winter?

Winter birds. Observe the appearance and habits of these. Upon what do they feed? How may we help them when their food is scarce?

Winter Weather:

Cold temperatures. The thermometer - its use and markings.

Effect of frost on the soil. (Notice its action on banks along the road).

The expansion of water when freezing. Why ice floats.

Other Things to Learn in Winter:

The air in the room - oxygen, nitrogen and carbon dioxide (Simple discussion only).

Fire - how it is produced, what it is, its uses, its dangers.

The magnet. Have some fun with it. What magnetism is, and how it works. (Do not attempt any complete discussion on the subject).

Electricity. Simple experiments with a comb, glass rod, and bits of paper to show the attractive force of electricity.

Evergreens. How to distinguish them by their needles, cones, etc.

Stars and planets. Every pupil should be able to find three or four constellations.

Plant Life:

Early spring flowers - the trillium, buttercup, violet, dandelion, strawberry, apple, cherry, etc. Learn something of the structure of these flowers - sepals, petals, stamens, pistil.

Conditions of plant growth. Germination of seeds. Functions of the root, stem and leaves.

Trees and their value to the land. How to plant them. Arbour Day - its proper observance.