Course Description:

Semester B of Grade 4 Science focuses on the relationship between heat, light, sound, and electrical energy and the way they can be transferred between each other. Learners distinguish between natural objects and objects made by humans as they examine technology and the role it plays in science. Students also look at life cycles of animals, plants, and humans and how they interact with each other. The course ends by looking at the ways that humans interact with the environment. Students will use research skills, watch videos, and get their hands dirty as they complete projects that require them to dig through dirt and trash in order to learn broader lessons that have to do with helping the environment.

Materials Needed:

- Materials to create a homemade musical instrument
- Walking spring toy, such as a Slinky®
- Medium-sized bowl
- Plastic cling wrap (for covering food)
- Rubber band
- Several grains of uncooked rice
- Metal clothes hanger with no plastic coating
- 2 pieces of string about 1 meter long
- Plastic ruler
- 9 drinking glasses, the same size if possible
- Pitcher
- Metal spoon
- Plastic report cover, clear
- Wire
- Cork or plastic-foam
- 2 metal thumbtacks
- Metal and non-metal objects
- 1 pair of socks
- 2 balloons
- Water
- Long string
- Lemon
- Zinc nail (galvanized nails are zinc coated)
- Copper nail (or thick piece of copper wire)
- 2 bar-shaped or cylindrical magnets, of the same type
- 10 small steel paper clips
- Large steel paper clip
- Toothpick
- Pair of tweezers
- Clothespin
- Spoon
- Brown paper lunch bag
- Colored pencils or markers
- 4 different vegetables from different parts of plants (leaf, root, stem, fruit, flower)
- Fork
- Knife
- Salad bowl
- Salad dressing
- 2 small glasses
- 2 different colors of food coloring (dark colors are best)
- Large stalk of celery
- 3 different types of flowers
- 2 different types of seed pods

- Pen or marker
- Metric ruler
- Scissors
- Clear tape
- Cardboard paper towel tube, cut to 20 cm long
- 10 cm square of black construction paper, of plastic wrap, and of waxed paper
- Small, colorful, and lightweight objects such as transparent beads, shiny confetti, and sequins
- Rubber band
- Magazines
- Poster board
- Quarter
- Shallow pan, such as a cake pan
- Index cards
- Ruler
- Mounting tack (for holding cards upright)
- Flashlight
- Sheet of black construction paper
- 2–3 trays of ice cubes
- 3 small zip-close plastic bags
- Clock or watch
- 3 bowls
- 3 identical plastic cups
- 10 small metal washers, all the same size (about 2 cm in diameter)
- Masking tape
- 1 Needle
- 1 Cork
- Sharp knife
- Small dish
- Large iron or steel nail
- 60 cm of insulated copper wire, with the insulation stripped off of both ends
- 1 D battery
- Packing or duct tape
- newspaper
- transparent tape
- meter stick or tape measure
- digital camera
- Sponge (simple, inexpensive sponge with no scrubber side)
- Plastic cup
- Saucer
- Sand
- Bath salts (such as Epsom salts--they must contain magnesium sulfate)
- 1 Apple
- an earthworm (in a jar with soil)
- 1 Rock
- Magnifying glass
- Drawing paper
- Colored pencils
- Variety of fruits, vegetables, and nuts
- Materials to create a seed display
- Long piece of paper or 3–4 pieces taped together
- Metric ruler
- 2 different-colored markers
- Dark scarf or bandana for a blindfold
- 2 objects that are interesting to touch
- 2 objects that are interesting to taste
- 2 objects that are interesting to smell
- 2 objects that make sounds
- Deck of cards
- Small box, like a shoe box
- Cardboard or heavy paper to make dividers
- Tape
- Black paper
- Small bean plant
- 200 of one color plastic building brick or block
- 20 of another color of block

- Materials for wrapping cups (such as bubble wrap, aluminum foil, plastic bags, newspaper, cardboard, or cloth)
- Large, shallow baking pan
- Thermometer
- D battery
- Indoor holiday light wire with one bulb (use an old chain that doesn't work anymore) with the ends bared
- 2 drinking glasses
- Leaf
- 4 shallow trays (could be cookie sheet, pie tin, cake pan, etc.)
- 50 cereal O's
- 50 dry spaghetti sticks
- 50 marbles
- 50 raisins
- Timer
- 2 of a third color of block
- 1 of a fourth color of block
- Box for a diorama
- Cardboard, heavy paper, and/or modeling clay to make creatures
- 1 Apple
- Napkin

Module	Lesson Title	Objectives
1	Sound	• Describe how vibrating objects produce sound. • Define pitch, and explain how it can be varied.
	Light	• Describe how light travels. • Explain how light is reflected, refracted, and absorbed.
	Heat and Temperature	• Describe how heat can be produced. • Understand the difference between heat and temperature. • Explain how heat can move from one object to another.
2	Electricity	• Define electricity, describe its importance, and name some people who discovered how to put that energy to use. • Describe static electricity and how it forms. • Describe current electricity, electric circuits, and materials that allow for the transfer of electricity.
	Magnetism	• Describe how magnets affect one another and objects around them. • Describe the effects of Earth's magnetism. • Understand that an electrical current can create a magnetic field, and name some uses for electromagnets.
	Science & Technology	• Distinguish between natural objects and objects made by humans. • Describe the relationship between science and technology. • Understand the technological design process.
3	History of Life on Earth	• Describe how the type of organisms living on Earth has changed over time. • Describe how fossils can provide evidence about the plants and animals that lived long ago and the nature of the environment at that time. • Explain how fossils can be compared to one another and to present day organisms to find similarities and differences.
	Characteristics of Life	• Describe the basic needs of all living organisms. • Explain how organisms rely upon their environments. • Give examples of plant and animal structures that serve essential functions.
	Animal and Plant Cells	• Describe the building blocks of life. • Describe the structure and functions of an animal cell.

Module	Lesson Title	Objectives
		• Describe the structure and functions of a plant cell. • Compare animal and plant cells.
4	Classifying Animals and Plants	• Explain why scientists use a system for classifying animals and plants. • Name the parts of the classification system. • Describe how animals are classified. • Describe how plants are classified.
	Plant Systems	• Describe the main parts of a plant. • Explain the system plants use to grow. • Explain the system plants use to reproduce.
	Human Body Systems	• Describe how the skeletal, muscular, and nervous systems work together to help humans move. • Describe how the respiratory, circulatory, and digestive systems work together to bring essential materials to all parts of the body. • Understand that the human body contains many systems for carrying out different functions, and that these systems depend on one another.
5	Human Nutrition and Health	• Define and give examples of basic nutrients. • Describe tools you can use to improve your health. • List several key benefits of regular exercise.
	Life Cycles	• Describe and provide examples of plant life cycles. • Describe and provide examples of animal life cycles. • Define the stages of the human life cycle. • Describe the difference between learned and inherited traits.
	Natural Responses	• Describe how the senses allow us to gather information about the world around us. • Explain how internal and external cues influence behavior. • Provide examples of the natural responses of plants.
6	The Web of Life	• Describe how energy flows through a food chain. • Describe how a food web shows multiple energy relationships in an ecosystem.

Module	Lesson Title	Objectives
		• Explain how even small changes in an environment can have a big impact on the organisms that live there.
	Biodiversity & Extinction	• Describe the major parts of an ecosystem. • Explain how an ecosystem can become balanced or unbalanced. • Describe biodiversity. • Define threats to biodiversity.
	Humans and the Environment	• Explain how to balance human needs with environmental protection. • Describe human population growth and why it causes concern. • Explain actions humans are taking to protect the environment.