Diocese of Allentown Science Curriculum
Grade 1 Scope and Sequence

Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 1: ***Use the scientific method, scientific tools, and safe lab procedures to solve problems.***		
Standards: • **Make purposeful observations using the appropriate senses.** • **Generate questions based on observations.** • **Identify strategies for gathering information (expert in field, books, observations, investigations, videos)** • **Conduct simple investigations.** • **Construct simple charts from data and observations.** • **Share ideas through purposeful conversation.** • **Communicate and present findings of observations (illustrations, models, writing).** • **Manipulate simple tools that aid in observation and data collection.** • **Make accurate measurements with appropriate units for the measurement tool.** A. The **Scientific Method** is the way that scientists learn and study the world around them. The steps include:	**ACTIVITY:** • Create a science handbook including Scientific Method & Scientific Process Skills • Observe objects using the appropriate senses • Classify items • Make a chart with data • Have students and parents sign a Lab Safety Contract • Include lab safety rules in science handbook • Include scientific instruments and tools, and their uses, in science handbook **LAB:** • The first lab should be a step by step practice using the Scientific Method of something they know (brushing teeth) • All labs should utilize the Scientific Method and Scientific Process Skills • Review safety rules at the beginning of every lab • Review instrument and tool name and use during every lab **INTERNET/SMART BOARD:** • Video clips • WatchKnowLearn.org • Discovery Education	

1. Observe and ask a question 2. Form a hypothesis 3. Identify the procedure (materials and steps) 4. Follow the procedure to conduct the experiment 5. Tell what was learned from the experiment (conclusion) B. Scientists use **Scientific Process Skills** to solve problems. 1. Observing 2. Classifying 3. Measuring • Length (inches, centimeters) • Mass (ounces, grams) 4. Communication 5. Interdisciplinary Skills C. Lab Safety is a set of rules that scientists practice to safely learn and study the world around them. These rules include: 1. I will follow directions 2. I will listen carefully 3. I will keep myself and others safe 4. I will clean my area after lab	**VOCABULARY: (for teacher information)** • Hypothesis: an educated guess • Procedure: the steps in an experiment • Experiment: a fair test designed to answer a question • Observations: noting and recording information • Conclusion: the result of outcome • Observing: ability to identify properties, structures, etc. through use of all senses • Classifying: ability to group, match, compare by commonality • Measuring: ability to find quantitative differences, to estimate, to calculate, etc. (standard & metric) • Communication: ability to verbally relate experiences, information and procedures with clarity • Wafting: waving a hand over a substance to draw a scent toward the nose • Scientist: a person who asks questions and tries different ways to answer them	

activities 5. I am a responsible scientist 6. Do not enter Science Lab without an adult 7. Do not eat or drink in the lab 8. Do not inhale; wafting permitted with teacher approval D. Scientific Instruments and Tools help scientists observe, describe and record the world around them. Instruments and tools include: 1. Ruler 2. Pencil 3. Balance 4. Magnifying Lens 5. Safety Goggles 6. Flashlight 7. Globe		

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 2: *All things on Earth can be classified as non-living or living.*		
Standards: • **Differentiate between living and non-living things.** • **Recognize the characteristics of living things (organisms) and non-living things.** • **Identify that both living and non-living things are matter.** A. Identify differences between living and nonliving things. 1. Characteristics of all living things (organisms): • Growth and death • Reproduction (produce young) • Respiration (the action of breathing) • Made up of cells 2. Characteristics of all non-living things: • Not living and never having lived	**ACTIVITY:** • Make a Venn diagram of living and non-living things • Make a list of biotic and abiotic things (in classroom, school, community, etc.) • Living and non-living scavenger hunt **LAB:** • Observe samples of living and non-living things with hand lens and microscope. **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • Organism: a living thing • Biotic: living or having lived • Abiotic: non-living or never having lived Matter: anything that has mass and takes up space	

B. Identify examples of living (biotic) and non-living (abiotic) things. 1. Living things • Frog, leaf, dead tree, wood 2. Non-living things • gold, rock, bicycle, cement C. Both living and non-living things are matter.		

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 3: ***Plants are living organisms and have basic needs: energy, nutrients, air and water.***		
Standards: • **Recognize that plants are living things that have basic needs.** A. Plants have basic needs: 1. Energy (sun light) 2. Nutrients (food) 3. Air 4. Water	**ACTIVITY:** • KWL chart of basic needs **LAB:** • Soy bean necklace **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • energy: sunlight • nutrients: food • botanist: a scientist that studies plants	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 4: ***Plants are made of several parts: seeds, roots, stems, leaves, flowers or cones, and fruit.***		
Standards: • **Identify the structures in plants.** • **Describe the function of each structure.** A. Plants are made up of several parts: 1. Seeds 2. Roots 3. Stems 4. Leaves 5. Flowers or cones 6. Fruit B. The parts of a plant work together in a system to provide: 1. Food production 2. Support 3. Water transportation 4. Reproduction 5. Growth 6. Protection	**ACTIVITY:** • Potato in jar • Leaf observation & classification • Flower, cone and fruit observation • Leaf rubbings • Plant seeds to grow in classroom **LAB:** • Observe parts of a plant • Stem function – Straw/paper flowers **INTERNET/SMART BOARD:** • Video clips **VOCABULARY:** • Seed: are made up of stored food (cotyledon), a tiny plant (embryo) and a seed coat. The tiny plant uses the stored food when it begins to grow. • Root: brings water and nutrients from the soil to the plant; keeps the plant in the soil • Stem: takes water and nutrients to the other parts of the plant; takes food from the leaves to where it is needed in the plant	

	• Leaf: absorbs sunlight to make food for the plant • Flower: makes the seeds • Cone: makes the seeds • Fruit: edible part of a plant that contains seeds • System: a group of interacting parts that form a whole	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 5: *Plants have a life cycle: seed to death.*		
Standards: • **Recognize that plants have life cycles and that they vary for different living things.** A. Plants have a life cycle. 1. Plants begin life as a seed, develop into adults, reproduce, and eventually die. The details of the life cycle are different for different organisms.	**ACTIVITY:** • Life cycle of plants sequence cards **LAB:** • Observe the life cycle of specific plants (Example: apple tree, pumpkin) **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • life cycle: the series of changes in the life of an organism • reproduce: the process that produces new plants • metamorphosis: several separate growth stages	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 6: *Animals (and humans) are living organisms.*		
Standards: • **Recognize that animals (and humans) are living things that have basic needs.** • **Recognize that animals have life cycles and that they vary for different living things.** • **Describe the major stages that characterize the life cycle of a specific animal.** A. Animals have similar characteristics and basic needs: 1. Must eat plants or other animals for energy. 2. They must breathe (respiration). 3. They reproduce; make babies. 4. They use their senses to find out about the world around them. 5. Most animals can move their bodies. B. Animals have a life cycle. 1. Animals are born (either alive from their mother or hatched	**ACTIVITY:** • KWL chart of similar characteristics and basic needs • Life cycle of animals sequence cards **LAB:** • Observe the life cycle of specific animals (Example: butterflies, frogs, humans, etc.) **INTERNET/SMART BOARD:** • WatchKnowLearn.org • video clips **VOCABULARY:** • organism: a living thing • life cycle: the series of changes in the life of an organism • reproduce: the process that produces new animals • zoologist: a scientist that studies animals	

from eggs), develop into adults, reproduce, and eventually die. C. The details of the life cycle are different for different organisms.		

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 7: *Some animals have backbones including mammals and reptiles.*		
Standards: • **Recognize that some animals have backbones, including mammals and reptiles.** • **Classify animals according to the characteristics they share.** A. Mammals 1. Warm blooded: body temperature stays the same. 2. Most have fur or hair on their bodies. 3. Give birth to live young. (exception: platypus & echidna lay eggs) 4. Feed their young milk. 5. They breathe with lungs. B. Reptiles 1. Cold blooded: depend on the sun and other heat sources for warmth. 2. Most have scales or scutes to cover and protect their skin. 3. Most lay eggs with thick shells; some give birth to live young.	**ACTIVITY:** • Make a Venn diagram of mammals and reptiles • Classify the features of each type of vertebrate • Make flashcards • Read book: *What is a Vertebrate?* By Bobbie Kalman **LAB:** • Observe different parts of animals: feathers, fur, snake skin, bones, leather, etc. **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • vertebrate: animal that have a backbone	

4. Breathe with lungs. C. Birds 1. Warm blooded: body temperature stays the same. 2. They have feathers. 3. Give birth to hard shelled eggs. 4. They breathe with lungs and have air sacs. 5. They have wings. D. Fish 1. Cold blooded: depend on the sun and other heat sources for warmth. 2. They have scales and fins. 3. They can breathe with gills. 4. Lay eggs in water. E. Amphibians 1. Cold blooded: depend on the sun and other heat sources for warmth. 2. They have smooth moist skin. 3. Breathe with lungs, skin or gills. 4. Lay eggs in jellylike mass in water.		

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 8: ***Some animals do not have backbones including insects and spiders.***		
Standards: • **Recognize that some animals do not have backbones, including insects and spiders.** • **Classify animals according to the characteristics they share.** A. Insects: arthropods that have a hard body case that covers the whole body. B. Spiders: arthropods with joined legs and a hard body case.	**ACTIVITY:** • Classify each type of invertebrate • Make flashcards **LAB:** • Observe different insects and spiders **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • invertebrate: animal without a backbone	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 9: ***Animals have different body parts, growth cycles, movements, needs, eating habits and body coverings.***		
Standards: • **Compare and contrast the characteristics of animals from different environments** A. Body parts B. Growth cycles C. Movements D. Needs E. Eating Habits F. Body Coverings	**ACTIVITY:** • Choose one specific animal from the four main categories (mammals, reptiles, insects and spiders) to explore, compare and contrast. Example: Mammal: cow Reptile: milk snake Insect: carpenter ant Spider: fishing spider **INTERNET/SMART BOARD:** • video clips	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 10: *Matter makes up all things.*		
Standards: • **Recognize that matter makes up all things.** A. All matter has mass and takes up space. 1. All matter is made up of parts too small to see called atoms. 2. Atoms that are joined together are called molecules. (For example, one oxygen atom and two hydrogen atoms join together to form the molecule water: H2O)	**ACTIVITY:** • Classroom scavenger hunt: find matter • Compose a class list of matter and draw pictures **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • Physicist: a scientist that studies matter • Matter: anything living or nonliving that has mass and takes up space • Atom: small particle of matter that can only be seen with a microscope • Molecules: a group of atoms joined together	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 11: ***The properties of matter can be observed using the senses.***		
Standards: • **Identify the observable properties of matter, including color, shape, size/weight, texture, form, feel, position and speed.** A. Properties can be observed using the senses. 1. Color 2. Shape 3. Size and weight • big/little • large/small • heavy/light • wide/thin • long/short 4. Texture • Rough/smooth 5. Form • Flexible/stiff • Straight/curved	**ACTIVITY:** • Create a properties of matter booklet/chart • Guess the object game: partners give properties to each other to guess the item **LAB:** • Observe different items ask questions and make predictions about properties. **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • Physicist: a scientist who studies matter	

6. Feel • Hard/soft 7. Position • Over/under • In/out • Above/below 8. Speed • Fast/slow		

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 12: *Matter can be measured.*		
Standards: • **Recognize that mass and volume of matter can be measured according to the specific substance.** • **Identify and demonstrate tools that measure mass and volume.** A. Matter can be measured 1. Mass • Measures solid substances • Measured with a balance 2. Volume • Measures liquid substances • Measured with a beaker or graduated cylinder	**ACTIVITY:** • Create a bar graph of objects, based on measurements taken in lab, from least to greatest (separate graphs for mass and volume) **LAB:** • Measure different things using a balance, beaker and graduated cylinder **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • Mass: the amount of matter in an object • Volume: the amount of space an object takes up	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 13: *The states of matter include solid, liquid and gas.*		
Standards: • **Identify objects and materials as solid, liquid, or gas.** • **Recognize that solids have a definite shape.** • **Recognize that liquids and gases take the shape of their container.** • **Compare and contrast solids, liquids and gases based on the basic properties of each state of matter.** A. There are three states of matter: 1. Solid • Have a definite shape • Molecules are very close together and cannot move out of place • Visible • examples: pencil, rock, chalk 2. Liquid • Does not have definite	**ACTIVITY:** • Create states of matter booklet, drawing pictures of each. **LAB:** • Have students pour the same amount of water into different shaped containers. • Demonstrate air filling a balloon. **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • States of Matter: solid, liquid or gas	

shape; take the shape of their container • Molecules are not as close together as a solid and are free to move • Most are visible • examples: water, milk, juice 3. Gas • Does not have a definite shape; take the shape of their container • Molecules move about freely • Invisible • examples: oxygen, carbon dioxide, helium		

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 14: ***Changes in states of matter generally result from changes in temperature.***		
Standards: • **Describe how water can be changed from one state to another by adding heat or taking away heat.** A. States of matter can result from changes in temperature. 1. Heat: To increase (raise) the temperature of something. • Heating can cause a solid to melt to a liquid. (ice becomes water) • Further heating can cause a liquid to become a gas (evaporation). 2. Cool: To decrease (lower) the temperature of something; the heat is removed. • Cooling can cause a liquid to change to a solid (water to ice), or a gas to change to a liquid (condensation). 3. Temperature is measured by a thermometer.	**ACTIVITY:** • Have students observe thermometers and make a model; explain how to use. • Have students keep an ice cube from melting **LAB:** • Experiment with water changing form: ▪ Measure temperature of water when a liquid; record data. ▪ Measure temperature of water (ice) when a solid (freezing); record data. ▪ Measure temperature of water (at boiling) when a gas (evaporation); record data. **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • temperature: the degree of heat present in a substance • heat: to make something hot; to increase energy and movement • cool: to take away heat; to decrease energy and movement • thermometer: the tool used for measuring temperature	

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Learning Standard	Ideas for Developing Investigations and Learning Experiences	Date Complete
Enduring Knowledge 15: *Matter is made from different materials.*		
Standards: • **Compare and contrast different materials, including wood, metal and plastic.** A. Material is a property of objects that describes the type of matter that an object is made from. 1. Wood 2. Metal 3. Plastic	**ACTIVITY:** • Cut out pictures in magazines and sort according to type of material • Predict from looking at the material of a simple tool or object what actions it might be used for **LAB:** • Have students observe various materials • Record similarities and differences • Record the properties of the different materials **INTERNET/SMART BOARD:** • video clips **VOCABULARY:** • Material: a property of objects that describes the type of matter that an object is made from • Wood: hard, fibrous, naturally occurring substance • Metal: strong substance that can be hammered and molded • Plastic: a hard, synthetic (man-made) material that can be molded	

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