KINDERGARTEN

State Goal 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems.

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
Critical to Understand and Master at Kindergarten: K.11.01 Ask an engaging question about objects, organisms, and events in the environment and discuss how the question can be answered.	• Be able to answer the question, What do you want to know? about an object, organism, or event in the environment (e.g., How long will a ball bounce when it is dropped? Does a snake feel slimy when I touch it?). • Engage in a conversation about how you can find out the answer to your question (e.g., stand on a chair, drop the ball, count the number of bounces; invite a person with a pet snake to come to class to touch the snake). • Ask a question about a pet or wild animal that interests you and talk about how you could answer the question.	Language Arts: Share a story relating to a change that has happened in the environment (e.g., a puppy is lost, snow has fallen). Language Arts: Discuss how you think the change happened and whether you can change it back.
K.11.02 Plan a simple investigation of objects, organisms, or systems and predict what might happen in the investigation.	• Tell what you are going to do and why you want to do it using common objects (e.g., I want to push this toy truck down the slide to see if it lands on its wheels at the bottom). • Tell what you predict will happen and why (e.g., I think it will land on its wheels because I will send it down the slide on its wheels). • Predict what will happen with curious objects such as a yo-yo rolling down a string, a Slinky, a magnet, or a ball with a rock taped to it.	Math: Group objects according to criteria (e.g., living or nonliving, will float or will not float). Art: Draw the set up for a simple experiment (e.g., a tub of water with floating and sinking objects in it).

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
K.11.03 Compare and contrast one's explanation with the explanations of other students or other teams.	• Watch an investigation with classmates, then contribute to a class discussion of what you observed and why you think it happened. • Be willing to consider others' explanations and ask polite questions of those students.	Religion: Share materials and work together in small groups; listen to the ideas of others. Language Arts: Talk about your findings with others.
K.11.04 Explain a simple design problem directly related to students' experiences (e.g., coat hooks, dirty shoes, storing books) and formulate ways to solve the problem.	• Work with the class to discuss problems that confront the students on a daily basis (e.g., muddy shoes, materials too high to reach easily, not enough materials for each student). • Be able to suggest a way to solve the problem and compare it with ideas of other students to choose the best idea. • Discuss ideas for how to solve the problem of other students reaching over and drawing on your piece of paper.	Social Studies: Tour the school to identify problem areas. Language Arts: Discuss possible solutions to solving the problem; request a meeting with the principal to discuss your solutions.
K.11.05 Design a device that will be useful in solving the problem.	• Plan a way to use simple materials to solve a classroom or home problem (e.g., design a structure to keep a sandbox dry in the rain or design a special device to hold toothbrushes and dental floss at your house). • Make a drawing of how you will solve the problem. Discuss the drawing with your teacher. • Draw a picture of a faster way for you to get to school.	Social Studies: Identify simple machines that people use to solve problems. Art: Draw a tool to solve a specific problem.

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
K.11.06 Build the device (individually or collaboratively) using the materials and tools provided (e.g., hammers, scissors, screwdrivers, rulers).	• Use simple materials to make a device that solves a classroom or household problem by following the plan you created or one agreed upon by the class. • Demonstrate the appropriate use of simple tools to accomplish tasks (e.g., use hammers to pound in nails, scissors to cut up paper, rulers to measure lengths of string).	Religion: Work together in small groups to successfully build a problem-solving device. Physical Education: Meet a physical challenge by working together (e.g., help everyone cross a rope bridge).
K.11.07 Decide if the solution worked based on test results.	• Participate in a critique of a solution to a problem and discuss why you think the solution is good or what you would suggest as an alternative solution. • Discuss as a class how well the structures you built worked to solve your problem (e.g., Was the sandbox dry even though it rained?).	Social Studies: Interview classmates to see how they feel about a particular subject (e.g., do they like dark chocolate, do they like to play games). Math: Graph the results of the surveys.
K.11.08 Apply simple tools of mathematics to measure data (e.g., counting, reading values from instruments) and simple operations to relate data (e.g., grouping in sets, addition, subtraction).	• Use a measuring cup to measure the ingredients for a powdered drink mix. • Sort objects according to similarities and count the number of objects in each group. • Graph the number of objects on a bar graph. Discuss what the graph displays. • Read the numbers from a ruler, and then use a ruler to measure pipe cleaners or other common objects.	Physical Education: Use a meterstick to measure how far you can jump. Math: Use a thermometer and a clock to measure the temperature each day at a specific time. Math: Group students with similar feelings about a subject so that you can make a graph that illustrates the trend among your classmates (e.g., most people like dark chocolate, a few people don't like dark chocolate, and one person doesn't eat any chocolate).

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
Significant to Develop at Kindergarten: K.11.09 Use numbers to characterize and then to group objects or events in the sciences. (11C)	• Talk about activities children participate in and group them by the time of day they occur (e.g., daytime and nighttime activities, activities that happen at 8:00 in the morning compared with those that happen at noon). • Count how many students are in your class and how many are boys or girls.	Language Arts: Retell steps in a story by telling what happened first, second, and third. Art: Draw and number the steps that a seed takes to become a plant.
K.11.10 Identify shapes and patterns that are found in nature and in things that people make (e.g., circles, rectangles, triangles, cubes); identify how measurements can be displayed with simple graphs. (11C)	• Take a nature walk and find 1 round thing, 1 square thing, 1 irregular-shaped thing, and 1 triangular thing. • Make footprints of students and measure them, then graph the measurements to see the range of sizes of feet. • Make a simple bar graph of the number of birthdays per month for students in your class.	Social Studies: Identify shapes found both outside and inside the classroom. Math: Create a bar graph showing the number of shapes that students can identify in a given area such as the playground or gym (e.g., 6 circles, 5 squares, 10 triangles).

State Goal 12: Understand fundamental concepts, principles, and interconnections of the life, physical, and earth and space sciences.

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
Critical to Understand and Master at Kindergarten: **Life Sciences** K.12.01 Give examples of the basic needs for animals and plants, such as air, protection, water, food, light, nutrients, and an appropriate environment (e.g., deserts, oceans, mountains).	• Describe that the basic needs of animals are air, water, food, protection, and shelter. • Describe that the basic needs of plants are soil, air, water, and light.	Social Studies: Read a nonfiction book that discusses how people in different environments provide for food, shelter, and other basic needs. Home Economics/Family Life: Make a chart about pets and discuss what you do to care for them.
K.12.02 Give examples of ways that offspring resemble their parents.	• Identify and discuss the similarities and differences between parents and their offspring. • Match baby plants and animals to their parents.	Religion: Talk about how God created humans in his image and likeness. Home Economics/Family Life: Bring family photos to class and identify resemblances between parents and children.
K.12.03 Describe changes in living things during life, from being born, to being young, then to being adult.	• Measure and chart growth and change. • Observe and record the phases in the life cycle of various organisms. • Be able to place in order pictures of organisms at various stages of their life cycles.	Language Arts: Make books about baby animals growing up. Drama: Participate in a teacher-led activity in which you pretend to be a caterpillar. Wrap in a blanket (cocoon) and then fly around as butterflies with wings you have made in advance.

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
K.12.04 Describe how plants need sunlight, soil, and water to grow.	• Conduct investigations with plants under various conditions (e.g., differences in light, soil, water) and report the conditions that enabled the best growth.	Math: Measure differences in the growth of plants that have been grown under different conditions. Geography: Find pictures of environments where plants grow and compare them (e.g., large of plants in a rainforest, smaller plants in a desert).
K.12.05 Describe and compare living things relative to nonliving things in their environments.	• Draw and describe a living and a nonliving thing together in their environment. • Discuss how a nonliving thing helps a living thing live and grow.	Religion: Discuss reverence for all living things. Religion: Discuss how humans differ from other living things in their ability to think, make choices, and love. Social Studies: Look at pictures of nonliving natural resources and discuss how they help living things in their environments (e.g., air, water, rocks, soil, sunlight).
Physical Sciences K.12.06 Compare objects that are made of one substance with objects that consist of more than one substance (e.g., wood, paper, metal, plastic, cloth, rock).	• Sort and group objects made of one substance and objects made of a combination of substances. • Identify pure substances versus mixtures of substances.	Art: Make homemade play dough; discuss how the ingredients combine to make a different substance. Home Economics: Use a simple recipe to make cookies or pudding; discuss how different the separate ingredients are from the finished product.

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
Earth and Space Sciences K.12.07 Describe parts of Earth made of rock, water, and air.	• Cut out pictures from magazines that show rock, water, and air. • Describe from your town things made of rock, water, and air. • Using a blow-up globe, toss, catch, and then describe what is under your right thumb (e.g., Are you covering rock or water? Where is air? Everywhere!).	Art: Discuss how you could make art using rocks (e.g., sand paintings, rock sculptures). Geography: Use maps or globes to find mountain ranges, oceans, lakes, and rivers and talk about how people use these physical features both for necessities and for recreation.
Useful to Work on at Kindergarten: K.12.08 Identify moving objects with different kinds of motion (fast, slow, straight, back and forth, circular, zigzag). (12D)	• Talk about the movement of an object using descriptive words for speed and direction (e.g., fast, slow, forward, back). • Compare the movement patterns of different objects (e.g., swimmer, seesaw, rolling ball).	Physical Education: Demonstrate, individually or as a group, how to move fast, slow, backward, forward, and so on. Music: Play different kinds of music and do movements that fit the music.

State Goal 13: Understand the relationships among science, technology, and society in historical and contemporary contexts.

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
Critical to Understand and Master at Kindergarten: ***Safety in science*** K.13.01 Demonstrate a knowledge of basic safety practices at home and when doing science at school (e.g., nothing in mouth without permission, "stop, drop, and roll").	• Talk about and practice what should happen after playing with objects and materials (e.g., wash hands, put away objects, clean up materials). • Discuss safety during recess (e.g., using the slide, not throwing sand or rocks). • Identify that substances, even those made of food, are not to be placed in the mouth during class (e.g., bread dough, play dough, gumdrop sculptures). • Be able to point out the emergency exit in case of a fire. • Use tools, toys, and art supplies safely (e.g., pencils, pens, scissors, string).	Language Arts: Contribute pages to a class book showing the dos and don'ts of safety. Social Studies: Using a class-generated checklist, survey your classroom or your home to check for safety.
Understanding science and technology K.13.02 Compare objects that occur in nature with objects that have been designed and made by humans.	• Sort a selection of objects into 2 categories, those occurring in nature and those made by humans and justify your choices. • Discuss how some objects are made of materials from nature but are constructed into objects by humans (e.g., wood to make a chair, wheat to make bread, limestone and rocks to make cement). • Observe a plant in soil in a ceramic or plastic pot and discuss which parts of the system are natural or not natural. Add water from the faucet and discuss what is now in the pot and whether it is natural or not natural.	Social Studies: Visit a factory or a museum exhibit in which you can see how something is made (e.g., glass blowing museum, cheese factory, steel plant). Home Economics: Examine things you use every day and classify them as natural or manufactured; discuss whether something from the one category could or should be substituted with something from the other category (e.g., natural cleaners vs. chemical cleaners, cotton fabric vs. polyester fabric).

LEARNING STANDARD/OUTCOME	SAMPLE ASSESSMENT	CONNECTIONS
Personal Health K.13.03 Give examples of good health habits for individuals and families (e.g., nutrition, dental care, personal hygiene, cleanliness, regular exercise).	• Make a list of good health habits that you practice every day (e.g., getting enough sleep, brushing and flossing teeth, eating healthy foods). • Identify good practices to follow across a year (e.g., dental visits, physical checkups, regular exercise). • Draw a picture of your favorite ways to exercise both outdoors and indoors.	Language Arts: Make a class "Alphabet of Health" book naming foods, habits, and activities that contribute to good health. Math: Chart health habits you practice, noting things that are done once a day, twice a day, and so on; make personal charts that show clock faces to illustrate at what time of day you perform different health practices.