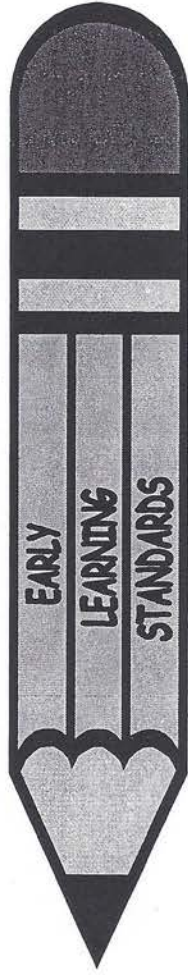


SCIENCE



for Pre-Kindergarten



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Young children are naturally curious explorers who are eager to discover information about the world around them. Children learn scientific concepts through opportunities to actively explore, observe and investigate materials and ideas, using their senses. These experiences provide the foundation for abstract and scientific thought. Programs support scientific learning by asking questions, conducting experiments, and helping children gather data and make conclusions. Science concepts are encompassed throughout the key areas of early learning; for example, children use pretend play to explore and manipulate materials, creative arts to discover a variety of ways to express their ideas, and literacy and language arts to research answers to questions.

Standard: Demonstrate understanding of the process of scientific inquiry

Indicator	Examples	Supportive Practices
SC 1.1 Show curiosity by asking questions and seeking information	<p>The child will:</p> <ul style="list-style-type: none"> Investigate new materials and displays Ask questions during group or individual times about their observations Collect objects during a walk, noticing similarities and differences Use senses to observe, explore and gather information ("This feels soft", "The flower smells pretty") Respond to "what if" questions Use tools such as magnifying glass, color paddles, scale, magnets, tape measures and microscope to explore materials Predict what might happen next, such as color made after mixing two colors together Make comparisons between objects based on attributes, such as "this apple is green and this apple is red" Participate in sink and float experiments Taste and describe a variety of foods Describe discoveries during exploration Sort objects based on whether they are found in the woods or in the sea Use language such as freeze or melt, sink or float, liquid or solid Participate in making applesauce, describing the process & observed changes Make observational drawings and charts 	<p>The adult will:</p> <ul style="list-style-type: none"> Provide tools for exploration, including magnifying glass, magnets, microscope, color paddles, tweezers, eye droppers, scale Display materials for comparison and exploration such as rocks, stones, seedpods, gourds, nests, pine cones, fossils, feathers, etc. Ask questions about discoveries made while playing, such as "How did you get that block to stay up there?" or "Why do you think they stuck together?" Support children's active exploration by encouraging them to use their senses to discover information Rotate materials periodically to encourage children to experience new things Collect, describe and record information through discussion, charts and drawings Extend children's thinking by asking probing questions such as "why do you think...?" Encourage children to document discoveries through drawings, stories, photos, graphs, and journals
SC 1.2 Collect, describe and record information		
SC 1.3 Use tools and equipment to explore objects		
SC 1.4 Make and verify predictions		
SC 1.5 Compare, contrast and classify objects and data		
SC 1.6 Use language that shows understanding of scientific principles		
SC 1.7 Participate in scientific investigations		

Standard: Acquire knowledge about the characteristics of living things

Indicator	Examples	Supportive Practices
SC 2.1 Recognize the difference between living and nonliving things	The child will: <ul style="list-style-type: none"> Notice changes in plants or animals such as beans sprouting, plants growing tall, animals' fur thickening 	The adult will: <ul style="list-style-type: none"> Display insects in "bug catchers"
SC 2.2 Notice changes in living things over time	<ul style="list-style-type: none"> Sort objects by living and non-living, such as rock to plant; dog to doll 	<ul style="list-style-type: none"> Keep a classroom pet, allowing children to care it
SC 2.3 Understand that plants and animals have life cycles	<ul style="list-style-type: none"> Sort objects by size, shape and texture, such as rocks, seeds and nuts 	<ul style="list-style-type: none"> Add live animals and plants (non-poisonous), along with models, including stuffed animals, plastic insects, dinosaurs and plants, and posters
SC 2.4 Notice similarities and differences and categories of plants and animals	<ul style="list-style-type: none"> Know adult and baby names for animals (lion and cub, dog and puppy) Understand that plants and animals need certain things for survival Sort pictures by plant and animal Describe differences and similarities in animals of the same species ("that cat is striped; this cat has a long tail") Describe basic needs for all living things Understand what care is required for pets Observe the effect of darkness and light on growing plants Recognize that animals live in different habitats according to their characteristics (fish live in water, tigers live in the jungle) 	<ul style="list-style-type: none"> Display ant hills, butterfly gardens, bird feeders or worm farms for observation and/or documentation through pictures, charts and words Read books about life cycles, plants and animals Furnish classroom with gardening tools, for inside and outside use Take nature walks, encouraging children to observe changes in plants and animals they see Set up an area in the room for exploration of items such as rocks, seeds, nuts or seashells Plant seeds with children and put on the windowsill to watch them grow Engage children in discussions about animals and plants they may see during walks or they hear about in stories

Standard: Acquire knowledge about the physical properties of objects

Indicator	Examples	Supportive Practices
SC 3.1 Describe, compare and categorize objects, based on their properties	<p>The child will:</p> <ul style="list-style-type: none"> Sort and classify by solid, liquid or gas Use a variety of block types 	<p>The adult will:</p> <ul style="list-style-type: none"> Rotate items in the sand/water table to include water, feathers, rice, soil, and sand
SC 3.2 Explore simple machines	<ul style="list-style-type: none"> Participate in sand and water activities Observe and describe what happens to objects when filled with gas 	<ul style="list-style-type: none"> Include different types of blocks for children to manipulate, such as: wood, legos, tinker toys, foam, plastic
SC 3.3 Explore, identify and describe changes that occur over time	<ul style="list-style-type: none"> Discuss what makes things run, how things operate, or how things move, such as how a car moves or how to operate the computer 	<ul style="list-style-type: none"> Include opportunities to make ramps and inclines in block area Display small materials such as shells, nuts, insects for children to investigate with a magnifying glass
SC 3.4 Use five senses to explore world	<ul style="list-style-type: none"> Explore a variety of tools such as magnets, magnifying glasses, mirrors, pulleys, or kaleidoscopes or prisms 	<ul style="list-style-type: none"> Display simple machines for use during play, including cash register, wind-up toys, and gears
SC 3.5 Experiment with the effect of their own actions on objects	<ul style="list-style-type: none"> Use a variety of classroom tools such as pencils, scissors and tape recorders Use a scale to determine which item weighs more 	<ul style="list-style-type: none"> Encourage the use of classroom tools such as pencils, scissors, silverware
SC 3.6 Understand that tools perform specific functions	<ul style="list-style-type: none"> Describe objects according to size, shape, color or state of matter Match things during tasting, smelling; listen to environmental sounds Demonstrate understanding of fast and slow, back and forth Use standard measures (yardstick or ruler) or non-standard measure (block or feet) to determine length or distance 	<ul style="list-style-type: none"> Add a workbench area where children can experiment with screwdrivers and hammers, nuts and bolts, etc Experiment with ice cubes to observe them melt; then re-freeze Schedule field trips to the airport or train station

Standard: Acquire knowledge about the physical properties of objects (continued)

Indicator	Examples	Supportive Practices
	<p>The child will:</p> <ul style="list-style-type: none"> • "Read" a thermometer to determine the temperature • Chart observations of tools such as temperature changes or which objects are repelled or attracted by magnets • Make ramps with blocks and observe cars' speeds as they go down the track • Use kites, flags, streamers or pinwheels to observe the wind • Draw pictures or write stories to describe observations about a kite flying activity or airplane they have observed • Recognize that different objects make different sounds, such as drums make low tones and bells make high tones • Describe objects in a feely box • Use writing tools and discuss their differences, such as pencil, marker, crayon • Manipulate simple machines to accomplish a purpose • Demonstrate creative thinking to use familiar objects to solve a problem (using a broom handle to get something under a bed) 	<p>The adult will:</p> <ul style="list-style-type: none"> • Determine which items dissolve in water; which items sink or float • Display real machines that can be safely taken apart and put back together, such as an old telephone without cords • Set containers of water on windowsills and observe for evaporation and condensation • Display books that illustrate characters using their senses for exploration • Ask children to draw the colors they see after investigating prisms or kaleidoscopes • Refer children to age appropriate books that demonstrate exploration of objects or materials • Allow children to explore alternate uses for tools • Encourage children's use of active media such as a computer, as a supplement to active, hands-on activities during free play • Create a listening center where children can use a tape recorder or CD player independently or with help • Create classroom books, helping children use staplers, hole punches, tape to put them together

Standard: Acquire knowledge about the earth and space

Indicator	Examples	Supportive Practices
SC 4.1 Understand changes in the environment, including weather and seasonal changes	<p>The child will:</p> <ul style="list-style-type: none"> Use vocabulary to describe features of the earth, such as rocks, soil, air Recognize and describe basic landforms such as hill, mountain, river Discuss things that can be found in the day or night time sky Use weather and seasonal vocabulary Name the four seasons and recognize that they repeat year after year Understand characteristics of each season (It snows in winter, we can swim in summer) Collect items to recycle Construct a compost heap Dress up in seasonal clothing in the dramatic play area Draw or write journals or stories about the changes in the seasons or weather Chart temperatures indoors and outdoors Observe shadows at various times in the day 	<p>The adult will:</p> <ul style="list-style-type: none"> Take children on nature walks to point out changes in the seasons such as leaf color, flowers blooming Keep a journal with a daily weather report Display a thermometer for children to check daily and/or graph monthly temperature changes Talk about clothing changes that are appropriate for the weather and add samples to the dramatic play area Display rocks, stones and pebbles of different colors and shapes for sorting and exploring Provide soil and containers for planting Provide flashlights for use Sort play items by day or night use, such as sunglasses, night light, flashlight, sun visor Trace shadows with chalk on the sidewalk Provide opportunities to experiment with pinwheels, streamers, flags or kites that move in the wind
SC 4.2 Investigate properties of rocks, soil and water		
SC 4.3 Explore the characteristics of the sun, moon, stars and clouds		
SC 4.4 Understand the importance of natural resources; that the environment provides for the needs of the people		
SC 4.5 Show beginning understanding of how human activities may change the environment		
SC 4.6 Participate in a variety of activities that preserve the environment		

Standard: Acquire knowledge about the earth and space (continued)

Indicator	Examples	Supportive Practices
	<p>The child will:</p> <ul style="list-style-type: none"> Describe where foods come from, such as milk comes from cows, corn is a plant Preserve classroom resources and materials, such as write on a full sheet of paper before discarding; take only the amount of food that can be eaten Describe the effect peoples' actions have on the environment (litter, picking flowers, walking on newly-seeded grass, and new plantings, recycling) 	<p>The adult will:</p> <ul style="list-style-type: none"> Take a field trip to the planetarium or a farm Include prisms in science area Create opportunities for children to engage in water play, including bubbles and to utilize boats, pipes sponges and sprinklers in their play Provide both wet and dry sand for exploration, as well as sifting, pouring and molding toys Display classroom pets who live in different habitats, such as fish in an aquarium, gerbils in a cage Read books about farming and the origin of food supply Emphasize the natural resources in surroundings while on walks ("birds will enjoy all the seeds from those sunflowers", "this mulch comes from tree trunks that were cut down and shredded. It helps keep us safe in case we fall.") Use vocabulary about the environment and ecology such as conservation, litter, recycle Discuss food product origins during mealtimes

Standard: Acquire knowledge about the earth and space

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SC 4.2 Investigate properties of rocks, soil and water	<ul style="list-style-type: none"> Recognize and describe basic landforms such as hill, mountain, river 	<ul style="list-style-type: none"> Keep a journal with a daily weather report
SC 4.3 Explore the characteristics of the sun, moon, stars and clouds	<ul style="list-style-type: none"> Discuss things that can be found in the day or night time sky Use weather and seasonal vocabulary 	<ul style="list-style-type: none"> Display a thermometer for children to check daily and/or graph monthly temperature changes
SC 4.4 Understand the importance of natural resources; that the environment provides for the needs of the people	<ul style="list-style-type: none"> Name the four seasons and recognize that they repeat year after year Understand characteristics of each season (It snows in winter, we can swim in summer) 	<ul style="list-style-type: none"> Talk about clothing changes that are appropriate for the weather and add samples to the dramatic play area
SC 4.5 Show beginning understanding of how human activities may change the environment	<ul style="list-style-type: none"> Collect items to recycle Construct a compost heap 	<ul style="list-style-type: none"> Display rocks, stones and pebbles of different colors and shapes for sorting and exploring Provide soil and containers for planting Provide flashlights for use
SC 4.6 Participate in a variety of activities that preserve the environment	<ul style="list-style-type: none"> Dress up in seasonal clothing in the dramatic play area Draw or write journals or stories about the changes in the seasons or weather Chart temperatures indoors and outdoors Observe shadows at various times in the day 	<ul style="list-style-type: none"> Sort play items by day or night use, such as sunglasses, night light, flashlight, sun visor Trace shadows with chalk on the sidewalk Provide opportunities to experiment with pinwheels, streamers, flags or kites that move in the wind

Standard: Acquire knowledge about the earth and space (continued)

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