Practicum

SCIENCE

SEMPER ALTIUS
SCHOOL NETWORK

Credits

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PRACTICUM

SCIENCE

SCIENCE

The competency developed in this Practicum is focused on the student's ability to gather information about the natural and physical world and organize that information into knowledge and theories.

STUDENTS ARE EXPECTED TO:

- Learn to use the scientific method in their everyday life, asking questions about objects, events and animals observed in their environment.
- Discover the world around them and refine their understanding of it by using their senses and scientific tools to observe, collect and interpret data and draw conclusions.
- Observe and explore the natural processes of growing, changing, and adapting to the environment.
- Recognize and investigate cause and effect relationships in everyday experiences: pushing, pulling, kicking, rolling, or blowing objects.
- Collect, describe, and record information about living things through discussion, drawings and charts.
- Predict, explain, and infer patterns based on observations and representations of living things, their needs, and life cycles.
- Understand and offer explanations of how things might work, communicating their findings informally in conversations, or through the documentation of results.
- Inquire and recognize the changes humans can induce in the environment by modifying and exploiting natural resources.
- Research and get involved in sustainable practices to care for the environment, developing awareness, responsibility, and active participation in their society.

To deliver this practicum, it is important to consider these minimum time requirements and periods according to the given curriculum map:

Grade	Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
Weekly periods		1	1	2	3
Time per period		20 minutes	30 minutes	30 minutes	30 minutes

In this practicum you will find the following strands, sub-strands and standards:

STRANDS	STANDARDS	
SCIENTIFIC INQUIRY	A1.E1.	Develop inquiry skills to understand facts about their world by observing and recognizing patterns, making predictions, experimenting with natural spaces, and recording their experiences using tools, instruments, and games as the principal strategy.
LIFE SCIENCE	A2.E1.	Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.
PHYSICAL WORLD	A3.E1.	Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.
ENVIRONMENTAL EDUCATION	A4.E1.	Demonstrate emergent awareness of the need for conservation, recycling, and respect for the environment and its natural resources by participating actively in green practices and becoming familiar with the plants and animals living in their surrounding area to enhance their connection to nature.

DIDACTIC QUESTIONS

WHAT WILL THE STUDENT LEARN?

The student will develop competence that states to build the scientific knowledge through the observation and comprehension of the environment and physical world.

Every learning standard and concept detailed here has been thought to enhance the cognitive development of the child.

WHY WILL THE STUDENT LEARN IT?

Scientific learning is one of the fundamental pillars of children's development. It provides problem-solving skills and develops critical thinking needed in everyday situations.

It is essential to begin instructional practices at the early stages of the children's development to build a solid basis for general knowledge.

HOW WILL THE STUDENT LEARN IT?

Instructional practices on the SASN embed inquiry and experimentation based on Model-Based Experimentation and Inquiry (MBEI) that enable children to explore, manipulate, collaborate, understand, and reach beyond the "here and now" to challenge themselves and transform information into meaningful content and skills.

WHAT MATERIALS WILL BE USED TO TEACH IT?

Science teachers create an environment where they and students work together as active learners, observing and using experimentation tools (e.g., glasses, magnifiers, scales, microscopes, as well as virtual platforms, instructional books, videos, and other digital resources.

HOW WILL THE STUDENT'S LEARNING BE EVALUATED?

Learning standards provide the framework for learning. They provide foundational information about what we should be able to know and do. In this case, preschool learning is evaluated using individual and collaborative assessments that challenge children to understand physical and natural phenomena through scientific thinking.

RECOMMENDATIONS FOR THE TEACHER

To achieve the standards listed in this practicum, teachers need to:

- ☑ Provide a supportive classroom climate that encourages children to pursue ideas through scientific inquiry skills.
- ☑ Provide opportunities for focused inquiry over more extended time periods.
- ☑ Encourage documentation of observations in journals with words and pictures.
- ☑ Provide tools for exploration (e.g., magnifiers, microscope, tweezers, eye droppers, scales, measurement cups and spoons, rulers, etc.)
- ☑ Use outdoor time as opportunities to explore and investigate the environment.
- ☑ Provide materials for children to sort, examine, and explore.
- ☑ Motivate collaboration and discussion among peers about their questions and observations.
- ☑ Encourage children to make predictions about simple experiments and observations.
- ☑ Provide opportunities for children to observe and investigate the characteristics of plants and animals in their natural habitats and in the classroom over time.
- ☑ Encourage children to explore available outdoor habitats and to participate in caring responsibly for living things.
- ☑ Provide opportunities for children to investigate changes in living things over time.
- ☑ Provide opportunities for children to explore motion.
- ☑ Provide various materials and objects in learning centers to encourage children to observe, manipulate, sort, and describe physical properties using their five senses and simple tools.

RESOURCES AND EQUIPMENT

Learning Science implies using plenty of instruments to ensure children's cognitive development, such as measurement and observation tools. It is recommended to have one item per student, except for scales and microscopes that can be shared in the classroom.

It is helpful to have "experimental or scientific toys" and instructional and playbooks to create learning experiences that entail individual and collaborative work for children.

Teachers should also engage in trends in scientific thinking, practice, and exploration. Instructional books such as "Jump into science" from Rae Pica and "The preschool scientist" from Robert Rockwell, Elizabeth Sherwood, Robert Williams, and David Winnett are excellent examples that can be used for teachers to design learning experiences and environments.

FOR THE LEARNING SPACE

To promote meaningful experiences in Science classes, teachers:

- design their physical setting,
- plan the areas of science children will focus on,
- design experiences that build on the materials and activities of interest to children,
- and establish overall goals for learning.

Science is a dynamic and open-ended search for discoveries and information. It includes individuals working together to build hypotheses, test theories, and assess what worked, what didn't work, and why.

In this Practicum, there are several learning environments suggested to trigger and enhance the participation of children in Science classes.
On the other hand, STEAM-Makerspaces are an excellent option to "build" knowledge from scratch. Any project can be constructed and developed. STEAM-Makerspaces can offer a suitable learning environment for children and teachers.

KNOWLEDGE TABLE

	CONCEPTS	ATTITUDES	PROCEDURES
SCIENTIFIC INQUIRY	• Physical characteristics of objects: size, shape, texture, color, etc. • Physical properties of objects: volume, weight, hardness, brightness, etc. • Measurement: scales, rulers, measurement cups, and spoons • Observation: lenses, magnifiers, microscope, binoculars, etc. • Comparison • Pattern • Inquiry • The Scientific method: observation, question, hypothesis/prediction, experiment (testing the hypothesis), recording results and conclusions / making inferences. • Phenomena	The student is expected to: • show interest when working and sharing with peers. • show curiosity when exploring the environment. • encourage peers to experiment or explore. • appreciate the natural environment. • learn how to use measurement and observation tools. • show respect for nature when participating in explorations and experiments.	The student is expected to: • predict what will happen in an observed situation. • compare and contrast ideas and results. • use proper scientific tools. • explore the natural world using her/his senses. • gather information in any way (e.g., drawings, recordings, writings, etc.). • identify cause and effect. • observe • investigate • inquire • research • make predictions about the general world. • communicate her/his findings. • work in collaborative groups.

A1.E1. Develop inquiry skills to understand facts about their world by observing and recognizing patterns, making predictions, experimenting with natural spaces, and recording their experiences using tools, instruments, and games as the principal strategy.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	**The student**	**The student**	**The student**	**The student**
	1. Will observe and explore the environment and recognize some patterns, with guidance and support.	**1. Using their five senses, will explore and learn from the environment, asking questions, and recognizing patterns in nature to set organized thinking.**	**1. Will describe objects and events in the environment using observation and measurement tools (i.e., magnifying glass, rulers, masking tape, etc.) to develop scientific thinking, with guidance and support.**	**1. Will communicate and report characteristics of objects or events in the environment using measurement tools and various ways (i.e., pictures, words, charts, models, and photos), with guidance and support.**
	1.1 With support, explores some common animals and plants using his/her senses. I.e., obsevrving a clover, he/she reacts to its color, shape, texture, and other physical characteristics.	1.1 With support, recognizes characteristics such as color, texture, size, etc., when observing objects and events in nature using his/her senses. I.e., observing plants in the schoolyard he/she recognizes the color of leaves, their size, their texture, etc.	1.1 With support, describes animals, plants, and environmental events using all senses. I.e., on a rainy day, he/she describes what the raindrops look like and how they feel, sound, smell, and taste.	1.1 Describes some characteristics of objects (e.g.: texture, shape, color, size, etc.) and events in the environment. I.e., in the schoolyard, he/she observes some ants and communicates some of their physical characteristics.
	–	1.2 With support, explores everyday objects in the	1.2 With support, describes objects in the classroom	1.2 Asks simple questions about general properties

A1.E1. Develop inquiry skills to understand facts about their world by observing and recognizing patterns, making predictions, experimenting with natural spaces, and recording their experiences using tools, instruments, and games as the principal strategy.

		classroom (toys, blocks, fabrics, sand, dough, etc.) and asks questions about them. I.e., preparing play dough, he/she asks, "how did it turn blue?"	(toys, blocks, fabrics, sand, dough, etc.) and asks questions about them. I.e., playing with blocks describes their shapes and asks, "which shape is this funny rectangle?" (rhomboid).	and functions of objects in the classroom (toys, blocks, fabrics, sand, dough, etc.). I.e., playing with racing cars on different types of ramps, wonders "which car is the fastest?"
	–	1.3 With support, observes details in objects in nature by using magnifying glasses. I.e., using a magnifier, she/he observes the structure of leaves, flowers, bark, seeds, a mosquito, an ant, etc.	1.3 With support, identifies, using a magnifier indicates how big or small some seeds and ants are characteristics of objects by using observation and measurement tools. I.e., using a magnifier, indicates how big or small some seeds and ants are.	1.3 With support, contrasts and compares animals and plants using observation and measurement tools. I.e., observing two different apples, uses a measurement tape to find which one is bigger.
	–	1.4 With support, observes patterns in nature, e.g.: the green color of leaves, the smooth texture of flowers, the movement of animals, etc.	1.4 With support, recognizes patterns in animals and plants e.g.: the green color of leaves, the smooth texture of flowers, the movement of animals, etc.	1.4 Identifies patterns in animals and plants, e.g.: the green color of leaves, the smooth texture of flowers, the movement of animals, etc.
	1.5 With support, observes simple experiments	1.5 With support, performs simple experiments	1.5 With support, describes the outcome of simple	1.5 Predicts the outcome of simple experiments

A1.E1. Develop inquiry skills to understand facts about their world by observing and recognizing patterns, making predictions, experimenting with natural spaces, and recording their experiences using tools, instruments, and games as the principal strategy.

	related to physical characteristics of liquid and solid substances (e.g., water, food colors, oil, milk, sand, soil, flour, salt, sugar, etc.) to recognize patterns in life. I.e., mixing various food colors in water recognizes the new colors obtained after the process.	related to physical characteristics of liquid and solid substances (e.g., water, food colors, oil, milk, sand, soil, flour, salt, sugar, etc.) to recognize patterns in life. I.e., mixes various food colors in water, describing the process performed.	experiments related to physical characteristics of liquid and solid substances (e.g., water, food colors, oil, milk, sand, soil, flour, salt, sugar, etc.) to recognize patterns in life. I.e., mixing various food colors in water describes the colors obtained.	related to physical characteristics of liquid and solid substances (e.g., water, food colors, oil, milk, sand, soil, flour, salt, sugar, etc.). I.e., mixing various food colors in water predicts what will happen if she/he mixes red and blue dyes
	–	1.6 With support, observes events in nature to make inferences about them. I.e., on a windy day, the teacher comments on how wind can make some things move; the next day he/she infers that on windy days plants move a lot.	1.6 With support, explores events in nature to make inferences about them. I.e., watching how trees move on a windy day, the teacher comments on how wind can make some things move; the next day he/she infers that on windy days plants move a lot.	1.6 Makes inferences about events in nature by observing, investigating and performing simple experiments. I.e., in the schoolyard notices that a plant is wilted and says that it needs some water.
	–	1.7 With support, describes processes of simple experiments to register and record her/his findings	1.7 With support, registers and records observations or findings (by drawing, painting, etc.)	1.7 Participates in guided investigations and makes observations using the senses (drawing, pain-

A1.E1. Develop inquiry skills to understand facts about their world by observing and recognizing patterns, making predictions, experimenting with natural spaces, and recording their experiences using tools, instruments, and games as the principal strategy.

	–	(by drawing, painting, etc.). I.e., in collaboration with friends, creates a collage of leaves collected during a walk around the yard.	in simple experiments. I.e., in collaboration with friends, creates a collage of leaves collected during a walk around the yard.	ting, recording, etc.). I.e., After carving a pumpkin, registers in her/his journal how the process was done, how it looks like on the inside, etc.
	–	1.8 Works in small groups with support and expresses her/his thoughts and ideas which may be correct or incorrect about general events in nature. I.e., exploring the physical states of water, when asked "what happened to the water?" explains, "it is hard now because we put it in the freezer."	1.8 Collaborates with others and shares findings and explanations, which may be correct or incorrect, about general events in nature. I.e., exploring the weather and the environment after a rainy day, says "look at the puddles, they are big because it was raining."	1.8 Participates in guided investigations and works in collaborative groups sharing her/his findings and explanations, which may be correct or incorrect, about general events in nature. I.e., working in teams to take care of a growing plant in the garden, communicates "the plant grew from a seed, just like the video/picture we saw!".

KNOWLEDGE TABLE

	CONCEPTS	ATTITUDES	PROCEDURES
LIFE SCIENCE	• Living and non-living things. • Characteristics of living things. • Characteristics and differences between animals and plants. • Needs for plants and animals. • Parts of the plant. • Parts of animals. • Life cycle of living things. • Body parts (e.g., head, hands, nose, tongue, etc.) • Body organs (e.g., brain, stomach, lungs, intestines, heart, etc.) • The five senses.	The student is expected to: • value the importance of animals and plants. • show responsibility when exploring nature. • show interest in taking care of animals and plants. • shows respect for nature. • show interest in her/his body and how to take care of it. • show curiosity and interest to manipulate simple exploring tools (measurement cups, rulers, scales, magnifiers, etc.) • show a systemic attitude towards the assessments and exploring activities.	The student is expected to: • distinguish between living and non-living things. • distinguish between plants and animals. • identify the needs of living things. • explore and take care of nature. • identify parts of plants and animals. • describe life cycles of living things. • identify body parts. • associate the five senses and some body parts. • use his/her senses to explore and investigate. • manipulate simple exploring tools (measurement cups, rulers, scales, magnifiers, etc.). • represent by drawing, modeling, painting, etc., some characteristics of the living things.

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	1. **Will explore living and non-living organisms, including physical features and behavior, with guidance and support.**	1. **Will observe and describe living and non-living organisms, including physical features (inside and outside) and behavior to acquire scientific vocabulary, with guidance and support.**	1. **Will sort objects by living and non-living things, to identify similarities and differences, with guidance and support.**	1. **Will explore and document the growth process of living things, using i.e., drawings, photos, journals, words, charts, models, etc., with guidance and support.**
	1.1 With support, explores physical features (color, shape, size, weight, etc.) of non-living things.	1.1 With support, observes physical features (color, shape, size, weight, etc.) of non-living things. I.e., playing with blocks (foam blocks and wood blocks), identifies which one is heavier.	1.1 With support, sorts several non-living things based on physical features (color, shape, size, etc.).	1.1 Describes the physical features (big, small, color, shape, shiny, transparent, opaque, etc.) of some non-living things.
	1.2 With support, observes physical features of animal and plants (wings, legs, teeth, claws, etc.; root, stem, leaves, buds, flowers, etc.) acquiring basic vocabulary.	1.2 With support, identifies physical features of animals and plants (wings, legs, teeth, claws, etc.; root, stem, leaves, buds, flowers, etc.) acquiring scientific vocabulary. I.e.,	1.2 With support, sorts several animals and plants based on physical features (wings, legs, teeth, claws, etc.; root, stem, leaves, buds, flowers, etc.) to identify their	1.2 With support, registers the physical features of animals (beak, feathers, fur, claws, teeth, etc.) and plants (root, stem, buds, leaves, etc.) and correlates them with their spe-

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

	l.e., on a nature walk in the schoolyard, indicates short plants and tall plants.	on a nature walk in the schoolyard, observes plants and identifies different parts.	functions. l.e., Using informational books, identifies which animals can fly.	cific functions. l.e., draws how ladybugs look like and describe the function of their wings.
	1.3 With support, observes the behavior of animals (e.g.: habitat, needs, niche, etc.) acquiring basic vocabulary. l.e., watching some videos about animal life, recognizes the sounds animals make, where they live, how their "houses" are, etc.	1.3 With support, identifies the behavior of animals (e.g.: habitat, needs, niche, etc.) in their natural environment. l.e., on a school trip to a park, observes a squirrel climbing up a tree, describes the squirrel's appearance, how it moves, recognizes the tree as its house, etc.	1.3 With support, classifies animals based on two or more patterns of behavior (e.g., habitat and food needs). l.e., looks at informational books and comments on which animals eat plants and live underground, which eat insects and live on trees, etc.	1.3 Sorts some animals based on patterns of behavior. l.e., watching videos of animal life, makes a collage of animals that build nests to raise their offspring, or animals that hunt for food, etc.
	1.4 With support, explores the environment to find out about the plants and pet animal's needs, acquiring basic vocabulary. l.e., in the schoolyard observes some plants, helps to water them, to change their pots, etc.	1.4 With support, observes some plants and pet animals in their environment acquiring basic vocabulary. l.e., during a nature walk, observes trees, flowers, the grass, etc., how they cannot move, that they need water, sun, and soil to grow.	1.4 With support, describes the plants and animals' needs to distinguish them. l.e., looks at informational books and describes the differences between plants and animals and what they need to grow.	1.4 Contrasts and compares plants and animals' needs to relate them with their habitats, and niches using illustrations, videos, books, photos, etc. l.e., guided by the teacher makes a collage of an ecological community and describes the needs, habitat and behavior of some animals and plants in the community.

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

	1.5 With support, observes humans' needs (e.g., food, shelter, rest, cloth, education) to understand her/his environment.	1.5 With support, explores humans' needs (e.g., food, shelter, rest, cloth, education) to understand her/his environment.	1.5 With support, identifies humans' needs (e.g., food, shelter, rest, cloth, education, etc.), using her/his own experiences.	1.5 Explains the basic humans' needs (e.g., food, shelter, rest, cloth, education, etc.) using her/his own words.
	–	1.6 With support, explores the characteristics of living things (e.g., require energy, reproduce, react to stimuli, grow and develop). I.e., on a nature walk in the schoolyard, observes that squirrels eat, run after loud noises, etc.	1.6 With support, identifies some patterns of living things (e.g., require energy, reproduce, react to stimuli, grow and develop). I.e., on a nature walk in the schoolyard, observes a caterpillar and points out that it eats leaves, moves when you touch it, etc.	1.6 Names some characteristics of living things (e.g., require energy, reproduce, react to stimuli, grow and develop). I.e., on a show-and-tell day brings a pet and explains how it reacts when playing, what it eats, how big it is compared to before, if it had been a mom, etc.
	–	–	1.7 With support, identifies some differences between living things and non-living things. I.e., on a nature walk in the schoolyard, tells his/her friends that a ladybug can move, can fly, eats other insects, then is alive. The teacher has a toy	1.7 Communicates some differences between living things and non-living things using her/his own words. I.e., after listening to a magical story, explains "this story is not real, rabbits and trees can´t talk".

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

			ladybug, then plays with it as if flying, and asks the children, is this alive?	
	–	–	1.8 With support, describes how animals grow and develop. I.e., looking at some interactive books, comments on how a goose develops from an egg to an adult goose.	1.8 Explains, draws or registers how animals grow and develop. I.e., looking at some interactive books, draws and comments how chicks are born, grow and become roosters or hens.

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	2. **Will explore human body parts and the five senses to acquire scientific vocabulary, with guidance and support.**	2. **Will identify human body parts, the five senses and some organs to expand her/his scientific vocabulary, with guidance and support.**	2. **Will describe human body parts, the five senses and some organs and their processes (e.g.: eating, sleeping, breathing, walking) to understand and take care of her/his own body, with guidance and support.**	2. **Will indicate knowledge of human body parts and some processes (e.g.: eating, sleeping, breathing, walking) to understand and take care of her/his own body.**
	2.1 With support, explores the body parts of her/his body (e.g.: head, hands, legs, eyes, nose, ears, mouth, etc.). I.e., plays and sings songs about body parts.	2.1 With support, recognizes the body parts of her/his body (e.g.: head, hands, legs, eyes, nose, ears, mouth, etc.). I.e., while playing with body parts models, points to his eyes and communicates "my eyes are in my head".	2.1 With support, describes the body parts of her/his body (e.g.: head, hands, legs, eyes, nose, ears, mouth, etc.). I.e., while reading science books of the human body, closes and opens his hand and communicates "my hand is for grabbing".	2.1 With support, describes the body parts of her/his body and identifies some general functions (e.g.: head, hands, legs, eyes, nose, ears, mouth, etc.). I.e., after a discussion about body parts, rides the bicycle and tells, " I am using my legs, my arms and hands to ride"
	2.2 With support, explores the five senses of the human body (sight, hearing, taste, touch, and smell) by playing, singing, wat-	2.2 With support, describes the five senses of the human body (sight, hearing, taste, touch, and smell). I.e., after	2.2 With support, relates the body parts with the five senses (e.g.: eyes -sight, ears - hearing, tongue -taste, skin -touch, nose	2.2 Makes the connection between body parts and the senses (e.g.: eyes -sight, ears - hearing, tongue -taste, skin

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

	ching videos, experimenting, etc.	tasting candy, lemon, milk, pretzels, etc., describes how it feels, if he/she likes it, etc.	-smell). I.e., touches a rough surface and smooth surface using her/his hands and tells "I can feel with my hands."	-touch, nose -smell). I.e., while playing covers her/his eyes and says, "now I can't see".
	–	2.3 With support, explores some organs and functions of her/his body using anatomic models, illustrations, videos, materials, etc. I.e., helped by the teacher, plays with a real stethoscope and feels the beating of her/his heart.	2.3 With support, observes some organs and functions of her/his body using anatomic models, illustrations, videos, etc. I.e., after lunch, points out her/his tummy and says, "I ate a lot, my stomach is full".	2.3 With support, describes some organs and functions of her/his body using anatomic models, illustrations, videos, etc. I.e., after a discussion about the heart, communicates "my heart beats fast when I run".
	–	–	2.4 With support, recognizes the connection between organs, senses and body parts with human processes (e.g.: eating-stomach-taste, breathing-lungs-smell, reading-vision-eyes, etc.) using materials such as illustrations, videos, anatomic models, etc.	2.4 Relates some organs, senses and body parts with human processes (e.g.: eating-stomach-taste, breathing-lungs-smell, reading-vision-eyes, etc.) using materials such as illustrations, videos, anatomic models, etc.

A2.E1. Recognize some characteristics of the living and non-living things around them by observing and documenting living processes in their daily life situations to expand their scientific thinking and vocabulary with interest and curiosity.

	–	2.5 With support, identifies the basic needs of humans and living things using her/his own experiences, to observe some patterns. I.e., watching a wildlife documentary, identifies the basic needs of lions in Africa.	2.5 With support, identifies the basic needs of humans and living things using her/his own experiences, to contrast and compare them. I.e., watching a wildlife documentary, explains how lions hunt for food and compares this activity with how humans obtain their food.	2.5 Identifies the basic needs of humans and living things and explains how these needs are met. I.e., in role play activities, performs as a mom bird and explains how she/he needs to take care of her/his bird-eggs to get them hatched.

KNOWLEDGE TABLE

PHYSICAL WORLD

CONCEPTS

- Natural events or phenomena (the rain, the fog, the snow, the rainbow, the thunder, etc.).
- Sun / moon
- Day / night
- Objects in the sky
- Weather
- Solar system
- Physical characteristics of earth materials (rocks, sand, soil).
- Water
- Movement of objects by applying a physical force (pulling, rolling, pushing, kicking).
- Movement by gravitational force and magnetic fields (dropping, throwing, using magnets).
- Description of the movement (speed and direction).
- States of matter (gas, liquid and solid).
- Changes in the state of water (solidification, vaporization, fusion).
- The water cycle
- The four seasons

ATTITUDES

The student is expected to:

- feel curious about different materials.
- show enthusiasm when discovering the solar system.
- show interest in describing textures and the state of different materials and products.
- feel curious and enthusiastic working with mobile objects.
- demonstrate interest exploring the physical transformation of water.
- show curiosity exploring the weather and the four seasons.

PROCEDURES

The student is expected to:

- describe daily weather.
- identify time patterns in day and night.
- identify the solar system.
- classify materials according to the state of the matter.
- contrast and compare the physical characteristics of solid and solid-like materials.
- contrast and compare the physical characteristics of liquid and liquid-like materials.
- explain the water cycle.
- describe the movement of objects.
- describe the four seasons.
- relate the weather changes with changes of seasons.
- describe the characteristics of natural events.

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	1. Will explore and observe some characteristics of objects and solid and non-solid materials (i.e., size, shape, color, weight, texture and sound) to become aware of their environment, with guidance and support.	1. Will identify some characteristics and physical properties of objects and solid and non-solids materials (i.e., size, shape, color, weight, texture and sound) to demonstrate awareness of their physical world, with guidance and support.	1. Will explore and describe changes in objects and materials (i.e., rearrangement of parts, change in color, shape, texture, temperature) to communicate and use scientific vocabulary, with guidance and support.	1. Will predict based on prior knowledge and experiences the changes that occur to some materials (i.e., that chocolate melts, springs shrink and expand, plastic balls shrink when temperature changes, etc.), with guidance and support.
	1.1 With support, explores some physical characteristics of solid objects (texture, color, size, shape, etc.) acquiring basic vocabulary. I.e., playing with blocks, observes the colors they have.	1.1 With support, identifies some physical characteristics of solid objects (texture, color, size, shape, etc.). I.e., playing with foam puzzles, identifies puzzle pieces shapes (circle, rectangle, square, star, polygon, rhombus, triangle, etc.).	1.1 With support, describes changes in appearance when solid objects are squeezed, smashed, crushed, cut, got wet, mixed, exposed to the sun, etc. I.e., describes how an apple looks on the inside and the outside when it is sliced by the teacher.	1.1 With support, predicts changes in physical appearance when some solid materials are smashed, crushed, squeezed, cut, got wet, mixed, exposed to the sun, etc. I.e., when asked to predict "what will happen if we wet a tissue paper?", answers it will absorb the water; then tests her/his prediction by adding water to a tissue paper.

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

	1.2 With support, explores some physical characteristics of non-solid objects (texture, color, size, shape, etc.) acquiring basic vocabulary. I.e., playing with slime or dough, observes the texture and shape those materials have.	1.2 With support, observes some physical characteristics of non-solid objects (texture, color, size, shape, etc.) acquiring basic vocabulary. I.e., playing with water observes that it can't be held with her/his hands, it needs a container to hold it.	1.2 With support, describes changes in appearance when non-solid objects are mixed, exposed to the sun, frozen, heated, squeezed, etc. I.e., freezing a container of water, comments on how it looks, the shape it has, its texture, etc.	1.2 With support, predicts changes in appearance when non-solid objects are mixed, exposed to the sun, frozen, heated, squeezed, etc. I.e., in response to the question "what will happen if we let dough directly on the sun?" comments dough will dry and get rough and hard, then tests her/his prediction.
	–	1.3 With support, explores some physical properties of objects (weight, temperature, brightness, hardness, softness, etc.). I.e., playing with marbles, recognizes marbles translucency and hardness.	1.3 With support, describes some physical properties of objects (weight, temperature, brightness, hardness, softness, etc.). I.e.: playing with chocolate bars, describes its weight, softness, etc.	1.3 Describes some changes in physical properties of objects (weight, temperature, brightness, hardness, softness, etc.). I.e., observing an ice cube in a bowl describes how the ice cube shrinks little by little and turns into water.

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	2. **Will explore the effect of movements (e.g., pushing, pulling, rolling, dropping) on certain objects, with guidance and support.**	2. **Will explore the effect of movements (e.g., pushing, pulling, rolling, dropping) on certain objects.**	2. **Will observe and describe the effect of her/his own action (e.g., pushing, pulling, rolling, dropping) on making objects move to become aware of cause-and-effect relationships, with guidance and support.**	2. **Will observe and describe the motion of objects (in terms of speed, direction, the ways things move) to make her/him aware of the continuous changes and movements of her/his surroundings, with guidance and support.**
	2.1 With support, manipulates a variety of objects to observe how they move (e.g.: pushing, pulling and rolling). I.e., bowling in the yard, rolls a ball to make the bowling pines fall.	2.1 Manipulates a variety of objects to observe how they move (e.g.: pushing, pulling and rolling). I.e., blows through a straw on a ping-pong ball and discovers that it makes the ball move.	2.1 With support, describes how objects move, after pushing, pulling, kicking and rolling them. I.e., kicks a soft plastic balloon and tells how far it goes, then kicks a soccer ball and tells how far it goes.	2.1 With support, describes the movement of objects in terms of speed, direction and way of motion. I.e., watching a car race, describes the speed of cars, direction and way of motion, etc.
	–	–	2.2 With support, observes the movement of objects on different surfaces (e.g.: smooth and rough surfaces, inclined planes or slopes). I.e., observes	2.2 Supervised by the teacher, describes the movement of objects in terms of speed, direction, and way of motion on different surfaces (e.g.: smooth and

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

			how remote-controlled cars (RC cars) move on a furry carpet, on the floor, on the sand or on a slope.	rough surfaces, inclined planes, or slopes). I.e., describes how peddling a tricycle on a carpet, on the floor, on the sand, or on a slope is.
	2.3 With support, manipulates a variety of objects to observe how they move (e.g.: dropping and throwing). I.e., observes and comments on how a feather, a ball, a ruler, etc., fall when they are dropped.	2.3 Manipulates a variety of objects to observe how they move (e.g.: dropping and throwing). I.e., explores and experiments how a feather, a ball, a ruler, etc., fall when they are dropped, then recognizes that the feather falls slowly.	2.3 With support, describes how objects move, after dropping and throwing. I.e., drops a ball from the table and at the same time drops a feather, then describes how ball moves compared to the feather movement.	2.3 With support, predicts how objects move, after dropping or throwing. I.e., makes a prediction about how objects will fall (like feathers and paper sheets, balls, pencils, etc.)
	2.4 With support, explores interactions between magnets and other materials.	2.4 With support, finds everyday objects that are magnetic.	2.4 Classifies objects that are magnetic and non-magnetic.	2.4 Predicts and explains, using their own words, interactions between magnets and magnetic materials.

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
		3. Will observe the three different states of water (liquid, gas, and solid) to communicate and use scientific vocabulary, with guidance and support.	3. Will identify the states of matter (liquid, gas, and solid) using the water cycle as an example, with guidance and support.	3. Will explore the effect of physical transformation of water (i.e., in water cycle) to make her/him aware of the continuous changes of the environment (weather), with guidance and support.
		3.1 With support, explores the solid state of matter using common objects (blocks, rocks, tools, toys, etc.).	3.1 With support, identifies the solid state of matter using common objects (blocks, rocks, tools, toys, etc.).	3.1 Explores the physical transformation of liquid water to solid water (ice).
		3.2 With support, explores the liquid state of matter using simple products (water, juice, milk, etc.).	3.2 With support, identifies the liquid state of matter using simple products (water, juice, milk, etc.).	3.2 Explores the physical transformation of ice to liquid water.
		3.3 With support, explores the gas state of matter using some illustrations and objects (clouds, air, helium balloons, etc.).	3.3 With support, identifies the gas state of matter using some illustrations and objects (clouds, air, helium balloons, etc.).	3.3 Explores the physical transformation of liquid water to steam (water as gas).

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

		–	3.4 With support, describes the water cycle using some materials and illustrations.	3.4 Recognizes the states of matter (liquid, solid, and gas) presented in the water cycle using some materials and illustrations.
		–	–	3.5 With support, observes and describes solid-like products (ice cream, bread, butter, foam, mousses, etc.) to contrast and compare them to solid objects.
		–	–	3.6 With support, observes and describes liquid-like products (gel, agar, jelly, aerosol spray, etc.) to contrast and compare them to solid and liquid objects.

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	4. Will observe some natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change, to become aware of her/his environment, with guidance and support.	**4. Will explore some natural objects in the sky (sun, moon, stars, clouds) to notice patterns of movement and apparent changes, with guidance and support.**	**4. Will describe natural processes that occur in the environment (i.e., day and night, movement of clouds, colors of the sky) focusing on the patterns and movements.**	**4. Will participate in simple investigations of objects found in the day or night sky to test a prediction (i.e., moon phases, sunny days, rainy days, etc.), with guidance and support.**
	4.1 With support, observes objects in the sky (sun and clouds) during the day.	4.1 With support, identifies objects in the sky (sun and clouds) noticing the movement of them during the day.	4.1 With support, describe some natural events that occurs during the day (movement of clouds, the sunset, colors in the sky, etc.).	4.1 With support, predicts some natural events that occurs during the day (the rain, the hot weather, changes in the clouds, etc.).
	4.2 With support, observes objects in the sky (moon and stars) that appear at night.	4.2 With support, identifies objects in the sky (moon and stars) that appear at night.	4.2 With support, describe some natural events that occurs during the night (the dawn, the appearance of stars and the moon, the moon phases, the cold temperature, etc.).	4.2 With support, predicts some natural events that occurs during the night (the dawn, the appearance of stars and the moon, the moon phases, the cold temperature, etc.).

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

	4.3 With support, observes light sources as lamps, the middle day sun, etc., in order to explore the shadows that can appear.	4.3 Explores and experiments the shadows that appear as a source of light is blocked.	4.3 With support, describes how shadows appear when a source of light is blocked.	4.3 Investigates the uses of sunlight and predicts what happens when clouds block the sun.

A3.E1. Describe some processes and changes in the physical world around them as seasons, movement and transformation of objects, and changes in the state of matter, to become aware of cause-and-effect relationships in daily life situations using their natural interest and curiosity.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	5. Will explore different weathers in her/his local area to acquire scientific vocabulary, with guidance and support.	**5. Will explore changes in weather to make her/him aware of natural phenomena in her/his surroundings, with guidance and support.**	**5. Will explore the four seasons that occur over time in her/his country, with guidance and support.**	**5. Will describe the seasonal changes in the environment to make them aware of the effect of such changes in her/his own life.**
	5.1 With support, recognizes the weather (sunny, rainy, windy, cold, snowy, foggy, etc.) at each day.	5.1 With support, observes the weather (sunny, rainy, windy, cold, snowy, foggy, etc.) during the days and months.	5.1 With support, observes and compares the weather (sunny, rainy, windy, cold, snowy, foggy, etc.) during the days and months.	5.1 With support, predicts weather changes (sunny, rainy, windy, cold, snowy, foggy, etc.) as time passes by (during a year, a month, etc.).
	5.2 With support, recognizes the four seasons that occurs over time in her/his country.	5.2 With support, observes the characteristics of the four seasons during the year.	5.2 With support, identifies the characteristics of the four seasons during the year.	5.2 Describes seasonal changes (winter to spring, spring to summer, summer to autumn, autumn to winter) during the year using some visuals, music, materials, etc.

KNOWLEDGE TABLE

ENVIRONMENTAL EDUCATION

CONCEPTS

- Nature
- Ecosystem
- Environment
- Natural resources
- Artificial resources
- Ecological problems:
    - Types of contamination
    - Global warming
    - Excessive exploitation of resources
    - Deforestation
    - Hunting
    - Excessive farming
- Forms of energy used by humans
- Sustainable practices
- Recycling
- Reusing
- Reducing
- Types of residues
- Composting
- Environmental education

ATTITUDES

The student is expected to:

- show interest in sustainability.
- feel empathy towards ecological problems of her/his community and the world.
- develop responsible habits of consumption.
- feel responsibility towards her/his community and the environment.
- show interest about the ecological problems of the world.
- feel enthusiasm about taking care of the nature.

PROCEDURES

The student is expected to:

- identify the types of residues.
- sort garbage (residues).
- reuse some materials and make something different from them.
- participate in sustainable practices for taking care of the environment.
- recognize the ecological problems of his country and the world.
- identify the consequences of the most important ecological problems.
- take care of the natural and artificial resources.
- produce ideas to take care of the environment (home and school).

A4.E1. Demonstrate emergent awareness of the need for conservation, recycling, and respect for the environment and its natural resources by participating actively in green practices and becoming familiar with the plants and animals living in their surrounding area to enhance their connection to nature.

Bambolino 2	Bambolino 3	Kinder 1	Kinder 2	Kinder 3
The student	The student	The student	The student	The student
	1. **Will observe the environment participating in activities related to its care (i.e., recycle, reuse, reduce some products), with guidance and support.**	1. **Will explore and identify some good practices and bad practices to take care of the environment (i.e., how to sort garbage), with guidance and support.**	1. **Will develop awareness of the importance of caring and respecting the environment, participating in sustainable projects (i.e., making compost to the class-garden), with guidance and support.**	1. **Will identify natural and renewable resources used in the classroom, in order to provide ways of conservation and care of them (i.e., unplug electrical devices, turn off the lights, reuse the water, etc.).**
	1.1 With support, explores the concept of environment (animals, plants, nonliving factors, weather, etc.).	1.1 With support, observes the concept of environment (animals, plants, nonliving factors, weather, etc.).	1.1 With support, describes the concept of environment (animals, plants, nonliving factors, weather, etc.).	1.1 With support, observes changes in the environment due to human activities (deforestation, soil, water and air contamination, hunting, etc.).
	1.2 With support, observes some forms of energy used by humans (heat, electricity and solar energy).	1.2 With support, identifies some forms of energy used by humans (heat, electricity, solar energy and fossil fuels).	1.2 With support, describes some forms of energy (heat, electricity, solar energy and fossil fuels) and their uses in daily life.	1.2 Describes some forms of energy (heat, electricity, solar energy and fossil fuels) and participates in taking care of them (promoting the use of bicycle, reducing the use of cars, recycling-reusing plastic containers, unplugging electronic devices, etc.)

A4.E1. Demonstrate emergent awareness of the need for conservation, recycling, and respect for the environment and its natural resources by participating actively in green practices and becoming familiar with the plants and animals living in their surrounding area to enhance their connection to nature.

	1.3 With support, observes the resources in the environment and participates in taking care of them (saving water, placing garbage in the container, recycling some objects, saving energy, etc.).	1.3 Explores resources used in the classroom (water, plants, soil, air, electricity, heat, etc.) focusing on taking care of them (close the faucet, water the plants, place the garbage in the correct container, unplug electronic devices, etc.).	1.3 With support, describes natural resources used in the classroom (water, plants, soil, air, etc.) focusing on taking care of them.	1.3 Names the natural resources used in the classroom (water, plants, soil, air, etc.) providing actions to take care of them.
	1.4 With support, explores the concept of garbage.	1.4 With support, identifies the types of garbage (organic and inorganic) produced by human activities.	1.4 Names the types of garbage and classifies them accordingly.	1.4 Describes and sorts everyday materials that can be recycled at home and in the school.
	–	1.5 With support, identifies some good practices and bad practices for taking care of the environment (I.e., garbage and wastes disposal)	1.5 With support, designs posters to raise awareness and promote good practices for taking care of the environment.	1.5 With support, participates in awareness campaigns to promote good practices for taking care of the environment (e.g., sorting and recycling garbage).

GLOSARY

BIOLOGICAL POPULATION	Group of organisms that belongs to the same species and lives in a particular geographic area at the same time with the capability of interbreed.
CAUSE AND EFFECT	Cause is what makes something happens (e.g., kicking a ball), and effect is what happens as a result of the cause (e.g., the ball is rolled).
CLIMATE	The weather conditions prevailing in an area over a long period.
COMPARE AND CONTRAST	Looking at similarities and differences in objects and events.
FORCE	Strength or energy as an attribute of physical action or movement.
GAS SUBSTANCES	One of the four states of the matter, these substances have no shape, no volume defined and can be highly compressed; examples are the helium gas of balloons, the air of plastic balls, the wind, etc.
GEL-LIKE SUBSTANCES	Semisolid and semiliquid substances like styling gel, gel pearls, antimicrobial gel, jelly, etc.
HABITAT	The home, place, or environment where an organism or a biological population lives.
HYPOTHESIS	A proposed explanation for phenomena that can be tested by an experiment.
INFERENCE	Assumption based on logic to draw a conclusion.
LIFE CYCLE	Series of changes in the growth and development of living things.
LIVING THINGS	Living organisms have the capacity for self-sustaining biological processes such as growth, reproduction, metabolic reactions, responsiveness to stimuli, development and need energy to make all these processes.

MEASUREMENT TOOLS	Simple tools used to determine volume, size and weight of objects and substances. Examples are rulers, measuring cups and spoons, and scales.
NATURAL RESOURCES	Raw materials supplied by the Earth and its processes.
NICHE	Defined as the job, function or role of an organism in a community (specific place where other organisms live and interact).
NON-SOLID MATERIALS	Are the ones that have no shape defined and can be compressed in certain degree. They are liquid substances like water, juice, milk, etc.; gel-like substances and gas substances.
OBSERVATION TOOLS	Simple tools used to extend observations. Examples are lenses, magnifiers, binoculars and simple microscopes.
PATTERN	Repeated processes that are exhibited in a wide variety of ways, identifiable recurrences of the element and/ or the form.
PHYSICAL CHARACTERISTICS	Observable features of materials and objects, such as the shape, the color, the size, the textures and the state of matter.
PHYSICAL PROPERTIES	Measurable features of objects and substances, such as the temperature, the weight, the brightness, the hardness, etc.
PREDICTION	A guess or estimation that is based on prior observations, knowledge and experiences.
REARRANGEMENT OF PARTS	Define as making some materials change only in their physical characteristics (shape, color, size). For example, cutting a piece of paper, constructing different structures using blocks, making new colors when mixing up paints, etc.
SOLID MATERIALS	Any material that has define form, a surface, and cannot be compressed, examples are rocks, paper, plastic, wood, etc.
SPECIES	A group of individual organisms that can interbreed and produce fertile offspring.
SUBSTANCE	Any material with a definite chemical composition (e.g., water, salt, sugar, gold, etc.)
SUSTAINABLE	Conserving an ecological balance by avoiding depletion of the natural resources for future generations.

RED DE COLEGIOS
SEMPER ALTIUS

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