CAISL
Carlucci American International School of Lisbon

EC5 KINDERGARTEN SCIENCE FRAMEWORK

Contents

THEMES AND CONTENT

- Forces and Interactions: Pushes and Pulls
- Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment
- Weather and Climate

SCIENCE AND ENGINEERING PRACTICES (DEVELOPED IN CONJUNCTION WITH THE PERFORMANCE INDICATORS)

Asking Questions and Defining Problems

Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions based on observations to find more information about the natural and/or designed world(s).
- Ask and/or identify questions that can be answered by an investigation.
- Define a simple problem that can be solved through the development of a new or improved object or tool.

Developing and Using Models
Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

- Distinguish between a model and the actual object, process, and/or events the model represents.
- Compare models to identify common features and differences.
- Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s).
- Develop a simple model based on evidence to represent a proposed object or tool.

Planning and Carrying Out Investigations
Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

- With guidance, plan and conduct an investigation in collaboration with peers (for K).
- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.
- Evaluate different ways of observing and/or measuring a phenomenon to determine which way can answer a question.
- Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.
- Make observations (firsthand or from media) and/or measurements of a proposed object or tool or solution to determine if it solves a problem or meets a goal.
- Make predictions based on prior experiences.

Analyzing and Interpreting Data
Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Record information (observations, thoughts, and ideas).
- Use and share pictures, drawings, and/or writings of observations.
- Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.
- Compare predictions (based on prior experiences) to what occurred (observable events).
- Analyze data from tests of an object or tool to determine if it works as intended.

Using Mathematics and Computational Thinking
Mathematical and computational thinking in K–2 builds on prior experience and progresses to recognizing that mathematics can be used to describe the natural and designed world(s).

- Decide when to use qualitative vs. quantitative data.
- Use counting and numbers to identify and describe patterns in the natural and designed world(s).
- Describe, measure, and/or compare quantitative attributes of different objects and display the data using simple graphs.
- Use quantitative data to compare two alternative solutions to a problem.

Constructing Explanations and Designing Solutions
Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.

- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
- Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.
- Generate and/or compare multiple solutions to a problem.

Engaging in Argument from Evidence
Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).

- Identify arguments that are supported by evidence.
- Distinguish between explanations that account for all gathered evidence and those that do not.
- Analyze why some evidence is relevant to a scientific question and some is not.
- Distinguish between opinions and evidence in one's own explanations.
- Listen actively to arguments to indicate agreement or disagreement based on evidence, and/or to retell the main points of the argument.
- Construct an argument with evidence to support a claim.
- Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence.

Obtaining, Evaluating, and Communicating Information
Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.

- Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).
- Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea.
- Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question and/or supporting a scientific claim.
- Communicate information or design ideas and/or solutions with others in oral and/or written forms using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, and/or design ideas.

SCIENCE NOTEBOOK EXPECTATIONS

- In Kindergarten, students are introduced to using a science journal as a reinforcement of their learning.
- Science journals usually include drawings with labels of their learning.

SCIENTIFIC WRITING EXPECTATIONS

- Students document their investigations by drawing their findings and labeling them.

SCIENCE LABORATORY SAFETY EXPECTATIONS

Students will be expected to learn and to follow the expectations for safe and appropriate practices during laboratory activity, as shown on the "Science Laboratory Safety" document.
See link below:
https://www.caislisbon.org/uploaded/Curriculum_links/Science/Science_lab_safety_EC3to5th.pdf

INFORMATION TECHNOLOGY EXPECTATIONS

Students will be expected to use a variety of digital tools according to grade level expectations stated in CAISL's Research and Information Technology Integration Scope and Sequence.
See link below:
https://www.caislisbon.org/uploaded/Curriculum_links/2019-2020/IT_Skills_Scope_and_Sequence_by_Grade.pdf

PERFORMANCE INDICATORS (ASSESSED ON REPORT CARDS)

PHYSICAL SCIENCE

Motion and stability: forces and interactions: Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. DOK 2
Motion and stability: forces and interactions: Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or pull. DOK 2
Energy: Make observations to determine the effect of sunlight on Earth´s surface. DOK 2
Energy: Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. DOK 2

LIFE SCIENCE

From molecules to organisms: structures and processes: Use observations to describe patterns of what animals (including humans) need to survive. DOK 2

EARTH AND SPACE SCIENCE

Earth's systems: Use and share observations of local weather conditions to describe patterns over time. DOK 1
Earth's systems: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. DOK 2
Earth and Human Activity: Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. DOK 1
Earth and Human Activity: Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. DOK 1

Earth and Human Activity: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. DOK 2

ENGINEERING, TECHNOLOGY, AND APPLICATIONS OF SCIENCE

Engineering Design: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. DOK 1

Engineering Design: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. DOK 1

Engineering Design: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. DOK 2