Kindergarten

Indiana's academic standards for science contain six standards. Each standard is described below. On the pages that follow, age-appropriate concepts are listed underneath each standard. These ideas build a foundation for understanding the intent of each standard.

Standard 1 — The Nature of Science and Technology
It is the union of science and technology that forms the scientific endeavor and that makes it so successful. Although each of these human enterprises has a character and history of its own, each is dependent on and reinforces the other. This first standard draws portraits of science and technology that emphasize their roles in the scientific endeavor and reveal some of the similarities and connections between them. In order for students to truly understand the nature of science and technology, they must model the process of scientific investigation through inquiries, fieldwork, lab work, etc. Through these experiences, students will practice designing investigations and experiments, making observations, and formulating theories based on evidence.

Standard 2 — Scientific Thinking
There are certain thinking skills associated with science, mathematics, and technology that young people need to develop during their school years. These are mostly, but not exclusively, mathematical and logical skills that are essential tools for both formal and informal learning and for a lifetime of participation in society as a whole. Good communication is also essential in order to both receive and disseminate information and to understand others' ideas as well as have one's own ideas understood. Writing, in the form of journals, essays, lab reports, procedural summaries, etc., should be an integral component of students' experiences in science.

Standard 3 — The Physical Setting
One of the grand success stories of science is the unification of the physical universe. It turns out that all natural objects, events, and processes are connected to each other. This standard contains recommendations for basic knowledge about the overall structure of the universe and the physical principles on which it seems to run. This standard focuses on two principle subjects: the structure of the universe and the major processes that have shaped planet Earth, and the concepts with which science describes the physical world in general – organized under the headings of *Matter and Energy* and *Forces of Nature*. In Kindergarten, students learn that objects are made of different materials and that they move in different ways.

Standard 4 — The Living Environment
People have long been curious about living things – how many different species there are, what they are like, how they relate to each other, and how they behave. Living organisms are made of the same components as all other matter, involve the same kinds of transformations of energy, and move using the same basic kinds of forces. Thus, all of the physical principles discussed in Standard 3 – The Physical Setting, apply to life as well as to stars, raindrops, and television sets.
This standard offers recommendations on basic knowledge about how living things function and how they interact with one another and their environment. In Kindergarten, students learn that different types of plants and animals inhabit Earth.

Standard 5 — The Mathematical World
Mathematics is essentially a process of thinking that involves building and applying abstract, logically connected networks of ideas. These ideas often arise from the need to solve problems in science, technology, and everyday life — problems ranging from how to model certain aspects of a complex scientific problem to how to balance a checkbook.

Standard 6 — Common Themes
Some important themes pervade science, mathematics, and technology and appear over and over again, whether we are looking at ancient civilization, the human body, or a comet. These ideas transcend disciplinary boundaries and prove fruitful in explanation, in theory, in observation, and in design.
A focus on *Constancy and Change* within this standard provides students opportunities to engage in long-term and on-going laboratory and field work, and thus understand the role of change over time
in studying The Physical Setting and The Living Environment.

Standard 1
The Nature of Science and Technology

Students are actively engaged in beginning to explore how their world works. They explore, observe, ask questions, discuss observations, and seek answers.*

Scientific Inquiry

K.1.1 Raise questions about the natural world.

The Scientific Enterprise

K.1.2 Begin to demonstrate that everyone can do science.

* observation: gaining information through the use of one or more of the senses, such as sight, smell, etc.

Standard 2
Scientific Thinking

Students use numbers, pictures, and words when observing and communicating to help them begin to answer their questions about the world.

Computation and Estimation

K.2.1 Use whole numbers*, up to 10, in counting, identifying, sorting, and describing objects and experiences.

Communication

K.2.2 Draw pictures and write words to describe objects and experiences.

* whole number: 0, 1, 2, 3, etc.

Standard 3
The Physical Setting

Students investigate, describe, and discuss their natural surroundings. They begin to question why things move.

Matter and Energy

K.3.1 Describe objects in terms of the materials they are made of, such as clay, cloth, paper, etc.

Forces of Nature

K.3.2 Investigate that things move in different ways, such as fast, slow, etc.

Standard 4
The Living Environment

Students ask questions about a variety of living things and everyday events that can be answered through shared observations.

Diversity of Life

K.4.1 Give examples of plants and animals.

K.4.2 Observe plants and animals, describing how they are alike and how they are different in the way they look and in the things they do.

Standard 5
The Mathematical World

Students use shapes to compare objects and they begin to recognize patterns.

Shapes and Symbolic Relationships

K.5.1 Use shapes — such as circles, squares, rectangles, and triangles — to describe different objects.

Standard 6
Common Themes

Students begin to understand how things are similar and how they are different. They look for ways to distinguish between different objects by observation.

Models and Scale

K.6.1 Describe an object by saying how it is similar to or different from another object.