September 2008

SC. - SCIENCE

SC.PK00. - Science **Pre-Kindergarten**

Standards **Indicators**

SKILLS & PROCESSES (1.O)

SC.PK00.10. **Students will demonstrate the thinking and acting inherent in the practice of science.**

From their very first day in school, students should be actively engaged in learning to view the world scientifically. That means encouraging them to ask questions about nature and to seek answers, collect things, count and measure things, make qualitative observations, organize collections and observations, discuss findings, etc. Getting into the spirit of science and liking science are what count most. By the end of grade 2, children will have had multiple experiences with applying and practicing all of the skills and processes across the content areas.

Constructing Knowledge

01 **Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things** (1.A.1)

- 01.a **Describe what can be learned about things by just observing these things carefully and adding information by sometimes doing something to the things and noting what happens** (1.A.1.a)
- 01.b **Seek information through reading, observation, explorations, and investigations** (1.A.1.b)
- 01.c **Use tools such as thermometers, magnifiers, rulers, or balances to extend their senses and gather information** (1.A.1.c)
- 01.d **Explain that when a science investigation is done the way it was done before, we expect to get a very similar result** (1.A.1.d)
- 01.e **Participate in multiple experiences to verify that science investigations generally work the same way in different places** (1.A.1.e)
- 01.f **Suggest things that you could do to find answers to questions raised by observing objects and/or phenomena (events such as water disappearing from the classroom aquarium or a pet's water bowl)** (1.A.1.f)
- 01.g **Use whole numbers and simple, everyday fractions in ordering, counting, identifying, measuring, and describing things and experiences** (1.A.1.g)

Applying Evidence and Reasoning

02 **People are more likely to believe your ideas if you can give good reasons for them** (1.B.1)

- 02.a **Provide reasons for accepting or rejecting ideas examined** (1.B.1.a)
- 02.b **Develop reasonable explanations for observations made, investigations completed, and information gained by sharing ideas and listening to others' ideas** (1.B.1.b)
- 02.c **Explain why it is important to make some fresh observations when people give different descriptions of the same thing** (1.B.1.c)

Communicate Scientific Information

03 **Ask "How do you know?" in appropriate situations and attempt reasonable answers when others ask them the same question** (1.C.1)

- 03.a **Describe things as accurately as possible and compare observations with those of others** (1.C.1.a)
- 03.b **Describe and compare things in terms of number, shape, texture, size, weight, color, and motion** (1.C.1.b)
- 03.c **Draw pictures that correctly portray at least some features of the thing being described** (1.C.1.c)
- 03.d **Have opportunities to work with a team, share findings with others, and recognize that all team members should reach their own conclusions about what the findings mean** (1.C.1.d)
- 03.e **Recognize that everybody can do science and invent things and ideas** (1.C.1.e)

Technology

Design and Systems

Children should design and make things with simple tools and a variety of materials. They should identify a need or opportunity of interest to them, and then plan, design, make, evaluate, and modify the design with appropriate help. Children may be inclined to go with their first design notion having little patience for testing or revision. Where possible, they should be encouraged to improve their ideas, but it is more important that they develop confidence in their ability to think up and carry out design projects. When their projects are complete, children can tell what they like about each other's designs.

Design Constraints

04 **Design and make things with simple tools and a variety of materials** (1.D.1)

- 04.a **Make something out of paper, cardboard, wood, plastic, metal, or existing objects that can actually be used to perform a task** (1.D.1.a)
- 04.b **Recognize that tools are used to do things better or more easily and to do some things that could not be done at all** (1.D.1.b)
- 04.c **Assemble, describe, take apart and reassemble constructions using interlocking blocks, erector sets and the like** (1.D.1.c)
- 04.d **Recognize that some kinds of materials are better than others for making any particular thing, for example, materials that are better in some ways (such as stronger and cheaper) may be worse in other ways (such as heavier and harder to cut)** (1.D.1.d)
- 04.e **Explain that sometimes it is not possible to make or do everything that is designed (**1.D.1.e)

Students should practice identifying parts of things and how one part connects to and affects another. Classrooms can have available a variety of dissectible and rearrangeable objects, such as gear trains and toy vehicles and animals, as well as conventional blocks, dolls, and doll houses. Students should predict the effects of removing or changing parts.

Designed Systems

05 **Practice identifying the parts of things and how one part connects to and affects another** (1.D.1)

05.a **Investigate a variety of objects to identify that most things are made of parts** (1.D.1a)

05.b **Explain that something may not work if some if its parts are missing** (1.D.1.b)

05.c **Explain that when parts are put together, they can do things that they couldn't do by themselves** (1.D.1.c)

Every opportunity should be taken to get students to talk about how things they play with relate to real things in the world. The more imaginative the conversation the better, for insisting upon accuracy at this level may hinder other important developments.

Making Models

06 **Examine a variety of physical models and describe what they teach about the real things they are meant to resemble**. (1.D.1)

06.a **Explain that a model of something is different from the real thing but can be used to learn something about the real thing** (1.D.1.a)

06.b **Realize that one way to describe something is to say how it is like something else** (1.D.1.b)

EARTH/SPACE SCIENCE (2.0)

SC.PK00.20. Students will use scientific skills and processes to explain the chemical and physical interactions (i.e. natural forces and cycles, transfer of energy) of the environment, Earth, and the universe that occur over time.

01 Describe the weather using observations. (PK – 2.E.2)

02.a **Observe and describe the weather using senses.** (PK – 2.E.2.a)

02.b **Describe qualitative changes in weather, such as temperature, precipitation, wind, etc.** (PK – 2.E.2.b)

LIFE SCIENCE (3.0)

SC.PK00.30. Students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.

01 **Observe a variety of familiar plants and animals to describe how they are alike and how they are different.** (PK – 3.A.1)

01.a **Observe and collect data about how some animals are alike in the way they look and the things they do.** (PK – 3.A.1.a)

01.b **Observe and collect data about how some plants are alike in the way the look and the things they do. (** PK – 3.A.1.b)

01.c **Use oral language to compare pictures or models of several animals (or plants) that look alike and of several animals (or plants) that look different and respond to questions that are raised by those who observe the pictures. (** PK – 3.A.1.c)

01.d **Identify some of the things that all animals do, such as eat and move around and then describe how their features (observable parts) help them do these things**. (PK – 3.A.1.d)

02 **Observe, describe and compare different kinds of animals and their offspring.** (PK – 3.C.1)

02.a. **Recognize and describe the similarities and differences among familiar animals and their offspring.** (PK – 3.C.1.a)

02.b **how offspring are very much, but not exactly, like their parents and one another.** (PK – 3.C.1.b)

03.c **Arrange illustrations of humans and other animals in development sequence from infancy to adult**. (PK – 3.C.1.c)

CHEMISTRY (4.0)

SC.PK00.40. Students will use scientific skills and processes to explain the composition, structure, and interactions of matter in order to support the predictability of structure and energy transformation.

01 **Use evidence from investigations to describe the observable properties of a variety of objects.** (PK – 4.A.1)

01.a. **Examine and describe a variety of familiar objects in terms of the materials from which they are made (clay, cloth, paper, etc)** (PK – 4.A.1.a)

01.b. **Based on data gathered describe the observable properties of familiar objects (size, shape, color and texture).** (PK – 4.A.1.b)

PHYSICS (5.0)

SC.PK00.50. Students will use scientific skills and processes to explain the interactions of matter and energy and the energy transformations that occur.

There are no Physics indicators for Pre-Kindergarten

ENVIRONMENTAL SCIENCE (6.0)

SC.PK00.60. Students will use scientific skills and processes to explain the interactions of environmental factors (living and non-living) and analyze their impact from a local to a global perspective.

There are no Environmental Science indicators for Pre-Kindergarten