Program of Study: Science

Science Programs of Study

- Elementary (Grades 1-6)
- Junior High (Grade 7-9)
- Science 10
- Science 14-24
- Science 20-30
- Biology 20-30
- Chemistry 20-30
- Physics 20-30

The elementary science program was last updated 15 years ago in 1996. It is scheduled to be revised in 2015; with full implementation by 2017.All of the other science programs have been updated within the last ten years. This could explain why the elementary program takes on a very different format than the junior high and high school programs.

Overall Goals (Grades 1-12)

The Science program of study is centered on creating and exploring a curiosity for science. The program is very focused on providing information that is going to be relevant to the students' everyday lives. The intention is to make students aware of how science and technology relate, how science is used within society, and to use their learned knowledge for further problem solving. The main aim of the program is to develop an understanding of science and technology while encouraging students to pursue science further in their later studies, as a hobby, and even as a job or career.

Elementary

Program Rationale and Philosophy

Young children already have a natural curiosity regarding the world around them. This program uses that curiosity as a basis for teaching them about the world of science. This program uses concepts that students are already familiar with as a starting point. They will build new knowledge and skills using active participation, involvement and communication.

Program Emphasis

There are two main emphases in the Elementary program: Science Inquiry and Problem Solving through Technology. Science Inquiry focuses on knowledge acquisition through questioning and analyzing. The main focus of Problem Solving through Technology is the acquisition of skills through research and reflection.

Program Structure

There are five units (A-E) per grade (1-6) in the elementary program of study. Each unit has an emphasis of either Science Inquiry or Problem Solving through Technology.

Learner Expectations

The learner expectations for the elementary science program are split in to three separate categories: skills, attitudes, and understandings; all of which have their own general learner expectations (GLE) and specific learner expectations (SLE). The skills and attitudes expectations are per grade, whereas the understanding expectations are stated for each of the five units for every grade. The skills expectations are further broken down in to two categories that match the program emphases: science inquiry, and problem solving through technology.

Example Learner Expectations

> Grade 1, Unit B: Seasonal Changes
>
> GLE: Students will describe seasonal changes, and interpret the effects of seasonal changes on living things.
>
> SLE: Students will identify and describe examples of plant and animal changes that occur on a seasonal basis.
>
> Nowhere in the program does it say that a certain unit has any timeline as long as expectations have been met by the end of each grade. This would be a good unit to spread across the whole year so that the students can actually see and record the seasonal changes and what effect they are having on plants and animals. Near the end of the year you can have students compile all of their recordings in to a report and have them analyze their findings to ensure they have a good understanding of the material.

Junior High and High school

Program Rationale and Philosophy

Both the Junior high and High school programs aim for all students to become "scientifically literate". To achieve this, the program will develop students' knowledge of the scientific method, problem solving skills, and analytical skills. These skills will be developed through relevant information; connecting science with technology, environment and society.

Program Emphasis

Nature of science:

- Scientific inquiry
- Scientific method
- Nature of science knowledge

Science and Technology:

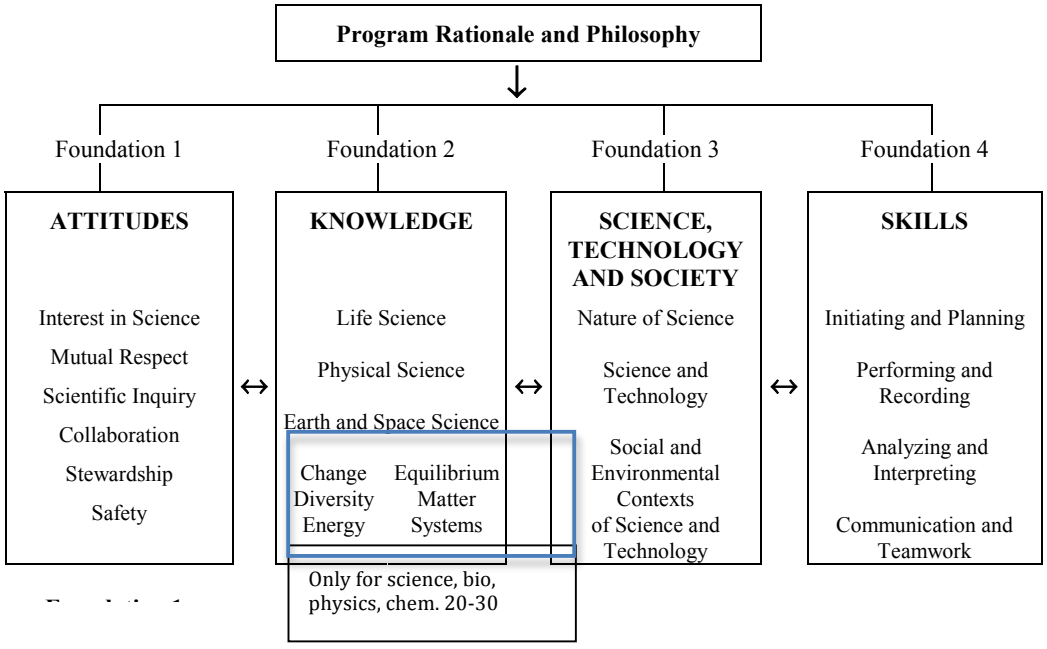
- Problem solving
- Hypothesis and experiment development

Social and Environmental:

- Applying science and technology
- Research and inquiry skills

Program Foundations

These foundations are the basis for both the Junior high and High school programs of study. The foundations identify the main emphasis of the program and provide guidance towards "scientific literacy".



Junior High and Science 10, 14-24

Program Structure

The junior high program has five units (A-E) per grade (7-9) whereas Science 10 and 14-24 have only four units (A-D) per course to allow for a more specific and in depth development of knowledge and skills.

Learner Expectations

As the foundations form the basis for the junior high and high school programs of study, learner outcomes are listed under each foundation for every unit of every

grade or course. For junior high, science 10 and 14-24 the Science, Technology and Society foundation is grouped with the Knowledge foundation making three categories for learner outcomes. Each of the three categories contains general learner outcomes (GLO) and corresponding specific learner outcomes (SLO).

Example Learner Outcomes

Grade 7, Unit B: Plants for Food and Fiber

> STS and Knowledge GLO: Students will analyze plant environments, and identify impacts of specific factors and controls.
>
> STS and Knowledge SLO: Describe and interpret the consequences of using herbicides, pesticides and biological controls in agriculture and forestry.
>
> This learner outcome presents a good opportunity to do some research on local agriculture, keeping the content relevant, and as a result, engaging. Students could research what kind of herbicides and pesticides the city they live in has used on parks and green spaces. They could look at what products the city used each year for a ten year span and how that affected the parks.

High School (Science, Biology, Chemistry, Physics 20-30)

Extra Program Emphasis & Foundation additions

The program emphasis, including the categories and points, for the higher-level science programs is the same as the junior high program, but has a few additional points. The extra points illustrate the more in depth skill and knowledge acquisition that should emerge from the higher-level science programs.

ICT Outcomes

For the higher science programs of study ICT outcomes have been integrated, instead of being a separate program. Many of the ICT outcomes are quite broad and can be implemented in many different ways.

Program Structure

Each course (e.g. Science 20 or Chemistry 30) consists of a total of four units.

Learner Outcomes

There are general learner outcomes for each unit of each course, and these GLOs are at the top of the pyramid. They are broken into each of the foundations, under which the specific learner outcomes can be found. The only exception is the “Attitudes” foundation. The “Attitudes” GLOs and SLOs are outlined for the entire course, rather than for each unit.