## 7.3 Policy on Teaching Science and Evolution

We are committed to providing an excellent education with an additional emphasis on science, as outlined in our Charter. The foundation of our science curriculum is contained in the Core Knowledge Sequence. We further supplement the Core Knowledge Sequence with the habits of mind from the Benchmarks for Science Literacy: Project 2061 (Oxford Press, 1993). We uphold the following principles in teaching science at Liberty Common School:

**Principles for Teaching Science:**

- Science is a particular way of knowing about the world. In science, explanations are limited to those based on observations and experiments that can be reproduced and substantiated by other scientists. Explanations that cannot be based on empirical evidence are not a part of science. For example, science can attempt to explain and formulate theories on the processes by which the universe was originally formed (i.e. Big Bang theory). However, science cannot comment on the role that supernatural forces might play in such events because such hypotheses cannot be tested and are outside the realm of science.

- We support teaching the following habits of mind from Project 2061:

    - Scientific knowledge is subject to modifications as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.
    - Some matters cannot be examined usefully in a scientific way. Among them are matters that by their nature cannot be tested objectively and those that are essentially matters of theology.
    - No matter how well one theory fits observations, a new theory might fit them just as well or better, or might fit a wider range of observations. In science, the testing, revising, and occasional discarding of theories, new and old, never ends. This ongoing process leads to an increasingly better understanding of how things work in the world, but not to absolute truth.

- Teachers are encouraged to include discussions of alternate scientific theories and the data that supports and contradicts existing theories. This is consistent with the Poudre School District policy IMB: "Teaching about Controversial/Sensitive Issues."

- Students should understand the difference between science based on direct observation and/or experimentation, and historical science, which is based on the study of past events. Historical science can be found in the fields of astronomy, geology, evolutionary biology, and archeology, and has led to such theories as the "Big Bang," tectonic plate theory, and the theory of evolution. Because it is based on past events, historical science generally depends on a higher degree of inference than science based on direct observation and experimentation.

**Principles for Teaching Evolution:**

- A clear and accurate description of terminology will be taught. The term "evolution" has become highly politicized and often misused to include a very broad spectrum of processes; from genetic mutation to gradual change over time to the origin of the human species. It is essential to distinguish between manifestations of evolution which can be directly observed and reproduced in the laboratory (microevolution of prokaryotic cells) and those which cannot be experimentally reproduced and involve a higher level of inference and historical science (macroevolution, origin of species etc.).

- In this context it is important to note that many biology textbooks present all aspects of evolution-from microevolution to macroevolution-as being equally supported by experimental and empirical evidence. Liberty will strive to accurately present the strengths and weaknesses of evolutionary theory and seek textbooks which present a more scientific and unbiased analysis of evolution.

- As with other topics, we will adhere to the Core Knowledge Sequence for determining when the theory of evolution is introduced to students ($7^{th}$ grade) and which subtopics should be covered.

- Discussions of evolutionary theory can lead to discussions of whether or not supernatural forces play a role in the mechanism of evolution or the origin of life. These topics extend beyond the scope of science and will not be taught at Liberty Common School. (See also: Colorado Model Standard for Science 3.4, which states, "This content standard does not define any student expectations related to the origin of life.")

- This policy is not intended to restrict the teaching of evolution as outlined in the Core Knowledge Sequence or limit the scientific discussion of related topics.

**Curriculum Considerations:**

Science text books which support the Core Knowledge Science Sequence have been approved for use in some grades. These are:

**$3^{rd}$ grade:** Crabtree Publishing, *The Science of Living Things*
**$5^{th}$ and $6^{th}$:** Prentice Hall, *Explorer* Series
**$7^{th}$ and $8^{th}$:** Prentice Hall, *Science* Series
**$9^{th}$ grade:** Prentice Hall, *Biology* by Miller and Levine

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## 7.4 Science Fair

The Science Fair at Liberty Common School provides the opportunity for students to learn firsthand the foundational principles and skills involved in scientific inquiry. In addition the Science Fair satisfies the requirements of Colorado state science standard 1, as well as providing preparation for the CSAP. The primary goal of the Science Fair is to cultivate interest in science by using the "scientific method." This includes the following steps:

1. An inquiry concerning some aspect of the natural world.
2. the collection of background information relevant to the area of inquiry
3. The formulation of a hypothesis.
4. The design of an experiment to test the proposed hypothesis.
5. Performing the experiment and data collection.
6. Data analysis to determine whether the hypothesis is supported.

In consideration of these goals, the following policies will apply to the Science Fair at Liberty Common School.

- Science fair projects will be experimentally based, including all of the elements described above; no descriptive, informational, "social science" (e.g. opinion surveys) and/or engineering projects will be allowed.

- Faculty approval will occur at defined stages to ensure that the Science Fair requirements are adequately addressed.

- In accordance with Liberty's Technology Policy, students will learn to use Excel spreadsheet software as a part of science class. Students will demonstrate basic proficiency by using Excel for data collection and analysis of science fair projects.

- Science Fair projects will be judged to insure that all of the criteria described above are included. Originality, creativity, and scientific integrity (use of appropriate variable and controls) as applied to the particular project will be evaluated. Particular emphasis will be placed upon student understanding and "ownership" of the project.

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