

## **Review of the Proposed Changes**

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- 1) This proposed change is fine, provided that the information presented in Kansas' science classrooms is recognized as being scientifically valid by the mainstream scientific community. Having said this, we need to acknowledge that the primary focus of K-12 science education is to communicate the important principles of modern science to pre-college students. Other important objectives are to help students understand the nature of science and to examine how scientific knowledge and policy influences our society and world. Educators must maintain an appropriate balance among these objectives.
- 2) The proponent's proposed changes to the evolution section confuse and obscure the principles of evolutionary theory through the use of erroneous and confusing philosophical language and misinformation. Evolutionary theory is a well-accepted scientific theory among all mainstream scientific organizations. It is a mature theory that has been refined over the past 150 years. There are no scientifically valid alternatives to evolutionary theory. There is no scientifically or educationally valid rationale for singling out evolutionary theory from among other scientific theories for critical examination.
- 3) In this statement, the proponents have confused science with how science is done. The current definition proposed by the writing committee correctly defines science. Science began limiting itself to seeking natural explanations for what we observe in the universe around us because commingling science and religion 500 years ago resulted in some wildly incorrect models of the universe. The proposed change is not a definition of science, but represents a partially accurate representation of how science is done.

Furthermore, the explanation betrays the proponent's total misunderstanding of science. Science is by definition limited to exploring the natural world and developing natural explanations for observable phenomena. These processes produce testable hypotheses. Science cannot examine the motives for the existence of the natural world or whether a prime mover was involved in its creation. These are philosophical and religious questions that are not testable by science.

- 4) Theories are the best models science has developed to explain the natural world. In many cases, they result from hundreds of years of critical observation and experimentation. There is no justification for treating mature scientific theories like evolution as either subjective or mere speculation.

Moreover, science makes no distinction between the validity of "historical" and "experimental" fields of inquiry. Scientific theories developed through the collection and analysis of historical artifacts are just as valid as theories developed through collection of data from contemporary experiments.

Finally, science cannot under any circumstances be characterized as any type of religion. Science is based on factual, testable observations and data. Religion is based on faith.

- 5) Again, scientists do not discriminate between scientific theories developed through the observation and collection of data that results from past events and data that results from contemporary studies. All scientific theories are under continuous scrutiny, being constantly tested against newly acquired data.
- 6) The assumptions that scientists make in developing a theory form a part of the hypothesis posed in the theory. As such, they are constantly tested against newly developed evidence. While it may be worthwhile in a few instances to illustrate the role that such assumptions play in the development of scientific theory, it is unnecessary and unreasonable to expect students to engage in frequent critical evaluations of these assumptions, particularly of theories like evolution that represent the well-accepted foundations of modern science.
- 7) The proponents are confusing the outcomes of scientific laws with the scientific laws themselves. The particular identity of the molecules that comprise the genetic code are not dictated by a scientific law, but their development as the carriers of the genetic code is completely consistent with known scientific laws. However, there is substantial scientific theory that explains the development of this molecular code in biological replication, and the existing sequence of the genetic code can be explained by the application of natural selection over the millennia.. Once again, scientific theories do not invoke non-natural explanations for natural phenomena. Complexity in the natural world, even seemingly baffling complexity, does not justify the use of faith in science as an explanation for natural phenomena. This does not mean that scientists cannot apply faith in framing their efforts to understand the underlying meaning of life. It means that science, by definition, cannot employ faith as a tool in scientific inquiry.