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January 6, 2003

Brenda West  
Office of Student Services and Assessment  
West Virginia Department of Education  
1900 Kanawha Boulevard, East  
Building 6, Room 722  
Charleston, WV 25305-0330

Re: Comments and Suggestions for the West Virginia SCIENCE – POLICY 2520.3  
Science Content Standards and Objectives for West Virginia Schools (the  
“Policy”)

Dear Ms. West,

Members of IDnet who have children enrolled in West Virginia public schools have requested our comments on proposed West Virginia SCIENCE – POLICY 2520.3 (the “Policy”), which may be found on your web site at: [\\_http://wvde.state.wv.us/policies/p2520\\_ne.html](http://wvde.state.wv.us/policies/p2520_ne.html). This letter reflects those comments.

Intelligent Design network, inc., is a national organization focused on the objective conduct and teaching of origins science - origins science that is conducted and taught without philosophic, religious or naturalistic bias or assumption. Intelligent design is a central aspect of that focus because current public school curricula generally use a naturalistic bias or assumption that life and its diversity are not the product of any intelligent cause. Instead, students are taught that life and its diversity result only from unguided natural processes. This is not a scientific conclusion, but rather a philosophical one that is contrary to a growing amount of scientific evidence which indicates that the apparent design we see in nature may reflect actual design. Accordingly, we believe that public school use of a naturalistic assumption against design is inappropriate for pedagogical, logical, scientific and legal reasons.

A number of materials regarding design theory and the issues addressed in this letter may be found at <http://www.IntelligentDesignNetwork.org/teachingresources.htm>. For a general discussion of the scientific and legal issues we suggest you review *Teaching Origins Science in Public Schools* at <http://www.IntelligentDesignNetwork.org/legalopinion.htm>. A short and more focused discussion of the issues may be found in a memorandum that we recently posted in response to a resolution of the American Association for the Advancement of Science (AAAS) at <http://www.IntelligentDesignNetwork.org/ResponsetoAAAS.pdf>.

## Summary of Suggestions

We are listing below general changes that we believe should be made to the Policy to ensure that it deals with the origin of life and the origin of the diversity of life (“origins science”) in a scientifically objective manner. We believe the Board should address these substantive issues. If it accepts their basic premise, then it should direct detailed revisions that will implement them. Our comments are limited to those aspects of the Policy that deal with or impact teachings about biological origins.

Following the summary we provide an explanation for the basis of each general suggestion. At the end of each explanation we have included specific recommendations to partially implement the general suggestions. Following the end of the letter we have attached a two-page document which summarizes both the general suggestions and specific implementing recommendations.

We are also attaching your standard comment form with cross references to applicable provisions of this letter.

Generally, we believe the policy should be revised to reflect the following general concepts:

1. Revise the policy to remove any implication that humans are “living objects.”
2. Revise the Standards to eliminate the naturalistic doctrine that natural objects and systems (natural phenomena, including life and its diversity), are not designed. Replace the doctrine with objectives that would encourage students to investigate and critically analyze the theories and evidence which supports both the design and naturalistic hypotheses.
3. Revise the Policy so that children are not introduced to origins science until they attain an age and maturity sufficient to fully comprehend the scientific bases for explanations and the philosophic implications of those explanations.
4. Add explicit provisions that will encourage teachers to (a) discuss origins science objectively and without philosophical, naturalistic or religious bias or assumption and (b) help students think critically about evolutionary theory and understand the full range of scientific views that exist regarding origins of life and why origins science may generate controversy.
5. Add objectives that will require students to learn about the naturalistic assumption used in current origins science and the effect that assumption has on textbook explanations, particularly in light of the historical character of origins science.

## Explanation

### 1. **Revise the policy to remove any implication that humans are “living objects.”**

The standards introduce students, beginning at a very early age, to the concept that all “living” things are “objects.” According to SC.1.4.1 first graders are to learn that natural objects are either “living or non-living.”

“SC.1.4.1 *classify objects as living* or non-living.”

According to Webster’s Third New International Dictionary, an object is a “discrete visible or tangible thing.” Although humans have physical characteristics, they also have non-physical elements such as consciousness, “free will,” minds and feelings. What truly defines each of us are our intangible or “invisible” non-physical attributes that account for our character, behavior, values, personality and commitments. We are what we *choose* to be. We never really conceive of ourselves as “objects.” Humans are sentient “beings.”

We recognize that you and other state officials responsible for the policy do not likely intend for the Policy to teach children that they are nothing more than material objects. However, considering the naturalistic and materialistic philosophy that undergirds the Policy, we believe that referring to living beings or entities as **objects** within the context of the Policy as it is presently written may have that *effect*. Furthermore, we believe it is inappropriate for the State to suggest to children that they are *living objects*. They are really human beings. When their bodies become nothing more than objects, they will then be classified as dead - non-living.

**Implementing Recommendations.** To implement this suggestion the Policy could be revised to expand the concept of “*object*” with “*phenomena*,” “*entities*” and “*human beings*.” Thus, SC 1.4.1 could be revised to read as follows:

“SC.1.4.1 *classify objects, phenomena or entities as living* or non-living.”

### 2. **Revise the Standards to eliminate the naturalistic doctrine that “natural objects” (natural phenomena, including life and its diversity), are not designed. Replace the doctrine with objectives that would encourage students to investigate and critically analyze the theories and evidence that supports both the design and naturalistic hypotheses.**

## The Policy Seeks to Teach that Life is not Designed

The Policy appears to have as its core a naturalistic assumption that life and its diversity derive only from natural processes and not by design. Naturalism is “the doctrine that cause-and-effect laws (as of physics and chemistry) are adequate to account for all phenomena and that teleological [design] conceptions of nature are invalid” (*Webster’s Third New International Dictionary of the English Language, Unabridged*, 1993). Naturalism is a philosophy and not a proven scientific theory or fact.

The Policy promotes the philosophy of Naturalism by seeking to imbue students with a belief that natural objects (which includes living objects) are not designed. This teaching is embraced by the first and third general objectives of Standard 3, the second general objective of Standard 5, and specific objectives under Standard 4 that focus on teaching only naturalistic theories of origins.

The naturalistic view is promoted by the second general objective of Standard 5. Under this standard students are required to learn to “*distinguish between natural and man-made objects.*”

“Students *will*: .....demonstrate the ability to distinguish between natural and man-made objects.”

Although the distinguishing characteristic between a “natural object” and a “man-made object,” is not expressly explained by this “objective,” the NAS source of the objective and other West Virginia objectives provide the explanation; - one is designed, while the other is not. The West Virginia Policy has been taken from the framework of Science Content Standards proposed by the National Academy of Science in its “National Science Education Standards.” These may be found at: <http://www.nap.edu/readingroom/books/nses/html/6a.html>. As explained by an excerpt from the National Academy of Sciences Science Content Standard E, the difference between a natural object and a man made object is that natural objects are not designed. They just “*occur*.”

#### **“UNDERSTANDING ABOUT SCIENCE AND TECHNOLOGY**

- A• People have always had questions about their world. Science is one way of answering questions and explaining the *natural world* [as distinguished from the “*designed world.*”]

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#### **ABILITIES TO DISTINGUISH BETWEEN NATURAL OBJECTS AND OBJECTS MADE BY HUMANS**

- “• Some *objects occur* in nature; others have been **designed and made** by people **to solve human problems** and enhance the quality of life.
- “• **Objects** can be categorized into two groups, **natural** and **designed.**”  
(See <http://www.nap.edu/readingroom/books/nses/html/6c.html#csck4>)

As we have already learned under SC .1.4.1 , “objects” are either “living or non-living.” Thus, by the end of the first grade, students are to learn that they are merely *living natural objects* that are not designed. They are to learn that they just “*occur.*” They are merely “**occurrences.**”

Objects that have been made by humans are designed; - they have been “**made**” for a “**purpose.**” This clearly implies that natural objects, like students, have not been “**made**” or “**designed**” for a “**purpose.**” This teaching reflects the fundamental tenet of naturalism that “teleological [design] conceptions of nature are invalid.”

The teaching that we are not designed, is reinforced by the general objectives of proposed West Virginia Standard 3:

**“Standard 3: Unifying Themes (SC.S.3)**

Students will:

“! demonstrate an understanding of interdependent themes present in the **natural and designed world** (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function),

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! demonstrate the ability to draw conclusions about and predict changes in **natural and designed systems.**”

The teaching that we are not designed is to be mastered by the end of the first grade:

“SC.1.5.1 distinguish between natural and man-made objects.”

**Teaching that life is not designed is scientifically and pedagogically inappropriate.**

We believe it is inappropriate for the State to teach that life is not designed for scientific, pedagogical and legal reasons.

The conclusion that life is not designed is a philosophical rather than a scientific conclusion. An extraordinary amount of scientific evidence supports a design inference. Not only do biologists acknowledge that living systems appear to be designed for a purpose, a growing body of scientific evidence suggests that the design we see in living systems is real and not just an illusion [For a brief discussion of the evidence see our memorandum to the AAAS dated December 19, 2002 at <http://www.IntelligentDesignNetwork.org/responsetoaaas.pdf>. ]

Every day the scientific evidence of design becomes more compelling as we peer into the awesome complex of cellular systems and see wonders never before imagined. Dr. Gene Myers, a lead scientist on the human genome project was interviewed after his team announced the mapping of the human genome. The following is the report of the dialogue between Dr. Myers and Tom Abate, a reporter for the San Francisco Chronicle:

“Now, with the pressure off, this former University of Arizona professor waxed philosophical on the code his team had cracked.

”**What really astounds me is the architecture of life,**’ he [Dr. Myers] said. “The system is extremely complex. **It’s like it was designed.**”

“My ears perked up.

“Designed? Doesn't that imply a designer, an intelligence, something more than the fortuitous bumping together of chemicals in the primordial slime?

“Myers thought before he replied. **‘There's a huge intelligence there. I don't see that as being unscientific.** Others may, but not me.’” [Tom Abate, “*Human Genome Map Has Scientists Talking About the Divine. Surprisingly Low Number of Genes Raises Big Questions,*” [San Francisco Chronicle (February 19, 2001)].

As Dr. Myers alluded, the conclusion that natural objects are not designed is a philosophic rather than an evidentiary conclusion. It merely reflects a philosophical commitment to **Naturalism**. The use of this preconception by science institutions was recently acknowledged in the July 2002 issue of the *Scientific American*: “**A central tenet of modern science is methodological naturalism.**” (J. Rennie, editor). Methodological naturalism is also called *scientific materialism*. It holds that only natural explanations of phenomena are allowed in science (regardless of whether or not they are true), and that design conceptions of nature are invalid, not as an evidentiary matter, but as a philosophical preconception.

The commitment to a naturalistic world view was explained in 1997 by Professor Richard Lewontin, a geneticist, as follows:

“...We take the side of science *in spite* of the **patent absurdity of some of its constructs**, *in spite* of its failure to fulfil many of its extravagant promises of health and life, *in spite* of the tolerance of the scientific community for just-so stories, because *we have a prior commitment, a commitment to materialism*. It is not that the methods and institutions of science somehow compel us to accept a material explanation of the phenomenal world, but, on the contrary, that **we are forced by our *a priori* adherence to material causes** to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how counterintuitive, no matter how mystifying to the uninitiated. **Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door.**” (emphasis added) [Richard Lewontin, *Billions and Billions of Demons*, (*The New York Review*, January 9, 1997, p. 31)]

Although this “*prior commitment*” may have some utility in *experimental* sciences like physics and chemistry, the *commitment* destroys objectivity in subjective *historical* sciences like biological origins, particularly where bias or preconception is not disclosed. This *commitment* permits only one answer to the religiously charged question - “**Where did we come from?**” According to this naturalistic bias, the only allowable answer to this question is that we are the result of a purely natural process, blind and unguided, and not one directed by an intelligence.

Teaching that we are merely natural objects that are not designed is the vehicle for advancing this philosophy. Teaching this philosophy while simultaneously omitting discussion of the design alternative and its supporting evidence amounts to nothing more than a form of indoctrination.

A decision to exclude objective consideration of a body of evidence relevant to the origin of life and its diversity for philosophic reasons is inconsistent with logic, the scientific method and the proposed learning objectives under the Policy. That method and those objectives are focused on the elimination of bias so that the evidence will dictate explanation rather than a preconception of what the explanation “should be.”

“SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, *objectivity*, openness, *skepticism*, appreciation, diligence, *integrity*, *ethical practice*, fairness, creativity).

“SC.9.2.8 ..... formulate and revise scientific explanations and models *using logic and evidence; recognize alternative explanations*; communicate and defend a scientific argument).

### **Teaching that life is not designed is Constitutionally inappropriate.**

State indoctrination of only one world view about where we come from also raises a Constitutional question. In our view state sponsored censorship of design theory in pursuit of a naturalistic world view conflicts directly with the requirement of the Establishment clause of the First Amendment that government be neutral with respect to its practices that touch religion.

When a public school chooses to discuss with children the question “*Where do we come from?*” the school has chosen to engage in a discussion that unavoidably impacts religion. Metaphorically, it has leaped over the wall that separates Church from State. Any explanation to this fundamental question will positively or negatively impact religious and nonreligious beliefs. A naturalistic answer to this question negatively impacts theistic religions and supports nonreligions like atheism, agnosticism and secular humanism. A design inference supports (but does not require) theism and challenges core tenets of atheism, agnosticism and secular humanism. However, implications by themselves do not make a religion. Neither evolution nor design theory need be religious or non-religious so long as each is genuinely open to testing, criticism, falsification and replacement by a better explanation, and so long as neither demands acceptance or adherence.

The problem is that the West Virginia Policy appears to seek adherence by students in a naturalistic world view. That policy not only ignores design theory, it overtly teaches that natural objects like humans, are not designed.

The Supreme Court has held that a state practice that “touches religion” must be neutral, not only between “religion and religion” but also between “religion and nonreligion.” Actual indoctrination of students in a world view that supports atheism, agnosticism and secular humanism and that denigrates theistic religions amounts to the state taking sides in a debate between “religion and nonreligion.” It is the antithesis of neutrality toward religion.

In *Epperson v. Arkansas*, the Supreme Court held that it was inappropriate for a state to take sides on a religious issue by censoring one of multiple theories of origins. Importantly it held that the neutrality that is required inheres not only between differing religious viewpoints, but also between “religion and nonreligion.”

“Government in our democracy, state and nation, must be neutral in matters of religious theory, doctrine, and practice. **It may not be hostile to any religion** or to the advocacy of no-religion; and it may not aid, or foster or promote one religion or religious theory against another or even against the militant opposite. **The First Amendment mandates government neutrality** between religion and religion, and **between religion and nonreligion.**”

“As early as 1872, this Court said: ‘The law knows no heresy and is **committed to the support of no dogma, the establishment of no sect.**’”

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“Judicial interposition in the operation of the public school system of the Nation raises problems requiring care and restraint. Our courts, however, have not failed to apply the First Amendment’s mandate in our educational system where essential to safeguard the fundamental values of freedom of speech and inquiry and of belief.....’ [t]he vigilant protection of constitutional freedoms is nowhere more vital than in the community of American schools,’ *Shelton v. Tucker*, 364 U.S. 479, 487 (1960). As this Court said in *Keishian v. Board of Regents*, **the First Amendment ‘does not tolerate laws that cast a pall of orthodoxy over the classroom.’** 385 U.S. 589, 603 (1967).”

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“.....**the State may not adopt programs or practices in its public schools or colleges which ‘aid or oppose’ any religion.** Id. at 225. **This prohibition is absolute. It forbids** alike the preference of a religious doctrine or **the prohibition of theory which is deemed antagonistic to a particular dogma.**” (emphasis added)

Recent Supreme Court decisions have reiterated the need for the state to be neutral when it engages in a practice that “touches” religion. In the June 2001 case of *Good News Club v. Milford School District* the Court held that the state violated its obligation of neutrality when it censored after hours use of its facilities by religious clubs. In the 2002 case of *Zelman v. Harris* the Court found that the required neutrality was satisfied when a state program did not *take sides* between “religious and nonreligious” schools.

Contrary to *Epperson*, *Zelman* and *Good News*, the proposed Policy appears to take sides on an issue that impacts religion and nonreligion. The Policy has as its objective the

teaching of students a naturalistic world view - a view that supports agnosticism, atheism and secular humanism and that is antagonistic to theistic religions. For an in-depth discussion of the legal issues see <http://www.intelligentdesignnetwork.org/LegalOpinion.htm>

**Implementing Recommendations.** The obvious solution to this problem is to replace the teaching that life is not designed with teachings that seek to have students explore the scientific evidence on both sides of that issue in an objective and unbiased way. This will yield a practice that is not only consistent with logic and the scientific method, but one that is also constitutionally neutral with regard to a subject that unavoidably impacts religion and nonreligion. The following is a replacement objective that would accomplish that goal:

**“SC 10.4.x.1 Understand the scientific evidence and arguments for and against the hypothesis that life and its diversity results only from unguided, natural processes.”**

- 3. Revise the Policy so that children are not introduced to origins science until they attain an age and maturity sufficient to fully comprehend the scientific bases for explanations and the philosophical implications of those explanations.**

After teaching first graders that life is not designed, the Policy carries forward this naturalistic theme by introducing at an early age the complex Darwinian evolutionary concepts of “adaptation,” common ancestry and natural selection as basics parts of primary education. Thus, in the third grade students are to learn about biological adaptation:

“SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are *adapted* to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).”

*Adapt* means “2: to adjust (oneself) to particular conditions or ways: bring (oneself) into harmony with a particular environment: ACCLIMATIZE .... (syn: adjust)” [Random House Webster’s Unabridged Dictionary (1999)]

While it is true that living systems appear to be “fit” for their environments, it is not clear that the specific characteristics that enable them to be fit have resulted via adaptation via natural processes or via design by an intelligent cause. Based on the available evidence one could logically infer in a scientifically reasonable way that in some respects life is fitted to its environments, not by adaptation, but by design.

The theme of change via natural rather than intelligent processes is carried on into the fourth grade:

“SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and *others result from interaction with the environment.*”

This explanation holds that change results only from inheritance or environmental circumstances - natural processes. Students are not invited to consider the alternative or the evidence that supports the alternative notion that the apparent design we see in nature is not just an illusion. It is undisputed that variation within a species may result from natural selection. That is “microevolution.” However, no coherent naturalistic theory has been postulated for the existence of life itself and considerable scientific controversy exists as to whether natural selection is sufficient to account for all of the diversity of life. It is inappropriate to begin to lead children to believe something that is controversial and that they are not equipped to understand.

The complexity of the ideas is even confusing to the naturalists that espouse naturalistic theories of the origin of diversity. In the NAS pamphlet on *Teaching About Evolution and the Nature of Science* a “common misconception” is explained:

“One common misconception among students is that individual organisms change their characteristics in response to the environment. In other words, students often think that the environment acts on individual organisms to generate physical characteristics that can then be passed on genetically to offspring. But selection can work only on the genetic variation that already is present in any new generation, and **genetic variation occurs randomly, not in response to the needs of a population or organism.** In this sense, as Francois Jacob has written, evolution is a “tinkerer, not an engineer.”<sup>2</sup> **Evolution does not design new organisms; rather, new organisms emerge from the inherent genetic variation that occurs in organisms.”**

The conclusion that changes in biological software occur only by a random mechanism is highly controversial, and is simply a reflection of a prior **commitment** to material and natural causes only.

In the fifth grade, students are introduced to natural selection:

“SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, *natural selection*, extinction.”

The capacity of natural selection to explain all the diversity of life is highly controversial and has not been experimentally confirmed. It is a speculative theory based on circumstantial evidence about singular events that have occurred in the distant past that has not been tested against the evidence that supports the design hypothesis. We believe it should not be discussed until students have been provided with (a) a general science background that will enable them to understand the scientific issues that bear on the theory and (b) the evidence both for and against the theory. This fifth grade objective seems to put the cart before the horse.

The focus on change via natural processes rather than design is further emphasized in the seventh grade:

“SC.7.4.7 evaluate how the different *adaptations* and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and *acquired adaptations*).

SC.7.4.8 analyze how changes in the environment have led to reproductive *adaptations through natural selection*.

The focus is to show that changes occur in living systems via a random natural process and not by design. Again, we think the cart is before the horse.

In the eighth grade students are introduced to a central and very controversial evolutionary thesis - that similarities in embryological development of very diverse organisms is evidence of each being derived from a common ancestor:

“SC.8.4.8 examine how patterns of human development are similar to other vertebrates.”

Textbooks typically seek to prove this concept by showing “artistic” illustrations of embryos of various vertebrates that all appear to look alike. This *similarity* is attributed to the existence of a common ancestor. In a recent book, a cell and molecular biologist points out that the illustrations have been drawn to intentional distort the true picture of embryological development [Jonathan Wells, *Icons of Evolution - Science or Myth? Why Much of What We Teach About Evolution is Wrong*, Chapter 5 (Regnery, 2000)]. In fact embryos of different vertebrates are very *dissimilar*.

The discussion continues in the tenth grade along with a discussion of fossil evidence of evolution:

Evolution and Interdependence of Organisms

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

There is no essential disagreement that the fossil record indicates significant change over time, together with a progressive increase in complexity. However, the evidentiary value of the fossil record to explain the cause of the diversity is exceedingly controversial. In many respects

the fossil record is more consistent with design theory. Darwin predicted that the fossil record would reflect gradual increases in complexity over time. Instead, the record actually reflects sudden bursts of increased complexity and long periods of stasis. This pattern significantly decreases the time available for the production of complex systems via chance mechanisms. It also is a pattern that is more consistent with the pattern of development of technology - a design process. In any event, the question is an historical question that can not be validated by experiment. It seems highly inappropriate to teach children that the fossil record, as a matter of fact, reflects a scientific explanation for the variation in species and common ancestry. They need to understand the evidence and arguments on both sides of the issue to become properly informed decision makers.

At the AB level, students are to learn the following:

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

All of these evidences for evolution are extremely controversial from a scientific standpoint. The example of variation in peppered moths as evidence of evolution has recently been discredited as a scientific hoax. See chapter 7 of *Icons of Evolution* and the recently published book by Judith Hooper *Of Moths and Men* (Norton, 2002).

The selective focus on only natural explanations that will support the **commitment** to naturalism is indicated by this reference to research projects that omits reference to current authors that have criticized evolutionary ideas.

AB.4.23 research pioneers and current authors of evolutionary ideas.

For lists of over 200 scientists, most of whom hold doctoral degrees, that have questioned evolutionary theory and reasons why “Evolution Only” is so controversial see: *Recent Polls and Congress Show a Demand For Objectivity in Origins Science* at <http://www.intelligentdesignnetwork.org/Polls.PDF>, and *Ten Reasons why Evolution Only is Scientifically Controversial* at: <http://www.intelligentdesignnetwork.org/tenreas.PDF>.

**Implementing Recommendation.** In conclusion we believe the Policy should be revised so that children are not introduced to origins science until they attain an age and maturity sufficient to fully comprehend the scientific bases for explanations and the philosophic implications of those explanations. When they are introduced to the subject, perhaps at the 10th grade level, they should be given all the material facts relevant to the issue of *where do we come from?* This will then equip them to make informed decisions about matters that may have a major impact on their lives.

This suggestion could be implemented by deleting the following objectives in grades three through eight (together with any repetitions of those objectives during those grades): SC 3.43, SC 4.45, SC 5.46, SC 7.47, SC 7.48, and SC 8.48.

4. Add explicit provisions that will encourage teachers to (a) discuss origins science objectively and without philosophical, naturalistic or religious bias or assumption and (b) help students think critically about evolutionary theory and understand the full range of scientific views that exist regarding origins of life and why origins science may generate controversy.

The standards contain a number of excellent objectives regarding the need to evaluate all scientific theories critically and with an open mind:

- SC.6.2.8 use *inferential reasoning* to make *logical conclusions* from collected data.
- SC.8.2.3 apply *skepticism*, careful methods, logical reasoning and creativity in investigating the observable universe.
- SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, *objectivity*, openness, *skepticism*, appreciation, diligence, *integrity*, *ethical practice*, fairness, creativity).
- SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., *identify questions and concepts that guide investigations*; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models *using logic and evidence*; *recognize alternative explanations*; communicate and defend a scientific argument).

However, students are not encouraged to use these scientific methods of critical analysis when they address evolutionary theory and origins science. Indeed, teachers that have even attempted to criticize evolutionary theory have been subjected to economic sanctions, loss of employment, reassignment and insult. Recently the ACLU filed suit against a sticker being placed on text books that simply advises students that evolutionary theory should be critically considered:

**"This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered."**

This censorship of criticisms of evolution and discussion of design theory merely demonstrates the *commitment* to *naturalism* that undergirds the teaching philosophy of national science organizations and the Policy. As a cure to the non-disclosed underlying naturalistic assumption and bias against criticisms of evolutionary theory, the Policy needs to expressly make these principles of objectivity applicable to evolutionary theory and origins science.

The need for objectivity and the elimination of bias has recently been expressed by Congress when it approved the No Child Left Behind Act and its accompanying Conference Committee Report, which states the following:

“The Conferees recognize that a quality science education should prepare students to distinguish the data and testable theories of science from religious or philosophical claims that are made in the name of science. **Where topics are taught that may generate controversy (such as biological evolution), the curriculum should help students to understand the full range of scientific views that exist, why such topics may generate controversy, and how scientific discoveries can profoundly affect society.**”

[No Child Left Behind Act of 2001, Conference Report to Accompany H.R. 1, page 703, (December 13, 2001, House Report No. 107-334)]

**Implementing Recommendation.** An objective that would satisfy this end might be phrased like the following:

SC 10.x.x.6      Understand scientific criticisms of evolutionary theory and the full range of scientific views that exist regarding origins of life and why origins science may generate controversy.

**5. Add objectives that will require students to learn about the naturalistic assumption that is used in current origins science and the effect the assumption has on textbook explanations, particularly in light of the historical character of origins science.**

The Policy reflects two critical omissions. First, it fails to require students to understand the underlying *naturalistic bias or commitment* that is actually reflected in the Policy, that is used by many evolutionary biologists to influence their investigations and explanations, and that inheres in virtually all biology textbooks. Secondly, the Policy fails to require students to understand that explanations about the origin of life and its diversity are by their very nature subjective “historical narratives” rather than facts or laws that have been scientifically confirmed by experiment.

The need to disclose the nature and effect of bias is explained by the National Academy of Sciences in its Publication *Science for All Americans On Line*:

“When faced with a claim that something is true, scientists respond by asking what evidence supports it. *But scientific evidence can be biased* in how the data are interpreted, in the recording or reporting of the data, *or even in the choice of what data to consider in the first place.*”

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“Bias attributable to the investigator, the sample, the method, or the instrument may not be completely avoidable in every instance, but *scientists want to know the possible sources of bias and how bias is likely to influence evidence.* Scientists *want, and are expected,*

to be as *alert to* possible *bias* in their own work *as in that of other scientists*, although such objectivity is not always achieved.”  
(emphasis added)

The problem here is not with undisclosed bias among a few independent investigators. It is with an undisclosed bias at the institutional level. The proposed West Virginia standards incorporate that bias by seeking to imbue students with the belief that they are merely natural objects that just occur rather than sentient humans that have been designed for a purpose.

However, contrary to the NAS guidelines, the standards contain no objectives for the disclosure of this bias to students. The failure to disclose that bias can reasonably be expected to lead students to take the naturalistic explanations at face value without knowledge that the explanations are affected by a very selective and naturalistic “*choice of what data to consider in the first place.*” Clearly, objectives are needed to show students how this naturalistic bias affects explanations about evolutionary theory.

**Implementing Recommendation.** An objective that could be incorporated into the standards to achieve this result would be as follows:

“SC 10.x.x.4 Understand that many explanations regarding the origin of life and the origin of the diversity of life are based in part on a naturalistic assumption that phenomena result only from natural causes and not by design. Understand the effect of this bias or assumption on the choice of data considered, the interpretation of data that is considered and the credibility of explanations that are provided.

The second omission is the failure of the standards to establish objectives for learning about the inherent subjective and speculative nature of origins science due to its historical character. Evolutionary biology, is an historical science whose explanations can not be validated by experiment. This is discussed by Dr. Ernst Mayr, a highly regarded evolutionary biologist:

“...Darwin introduced historicity into science. Evolutionary biology, in contrast with physics and chemistry, is a historical science -- the evolutionist attempts to explain events and processes that have already taken place. **Laws and experiments are inappropriate techniques for the explication of such events and processes.** Instead **one constructs a historical narrative**, consisting of a tentative reconstruction of the particular scenario that led to the events one is trying to explain.” (emphasis added)

According to scientists who specialize in historical sciences, the only way to test an historical hypothesis is to show that the available evidence supports one hypothesis *better* than it supports any competing hypotheses. The problem is that the prior *naturalistic commitment* to the view that systems are not designed protects evolutionary biology from testing by the competing design hypothesis. Due to the “*choice of what data to consider in the first place,*”

evolutionary theory has not been tested by that alternative explanation. This allows evolutionary theory to be incorrectly viewed as “fact” when it actually reflects nothing more than an hypothesis that has not been experimentally tested and that is supported only by a number of historical narratives constructed by human minds using selective evidence and imagination to fit within the framework of a preconceived idea that natural phenomena (including humans) have resulted only from a combination of natural law and chance and not by design.

**Implementing Recommendation.** To avoid this misinformation, the Policy should require students to understand how the historical character of origins science affects the inherent credibility of its explanations and why those explanations are very speculative.

An objective that might be used to reflect this goal is as follows:

SC 10.x.x.3      Differentiate between historical sciences such as evolutionary biology and experimental sciences like physics and chemistry, understand methods used by scientists to test the credibility of historical hypotheses, understand the limitations of those methods to confirm historical explanations provided and understand how *bias* and the “*choice of what data to consider in the first place,*” may affect historical explanations.

## Conclusion

Standard six deals with the intersection between science in personal and social perspectives.

### “Standard 6: Science in Personal and Social Perspectives .

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems.”

Under this general objective, students, among other things are to learn to do the following:

SC.5.6.1    use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.9.6.3    describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

However, all of these decision making objectives assume that a naturalistic view of the world is correct and true. That is not the case. Naturalism is just one view of the world. Other legitimate views exist. Unless students are exposed to the alternatives they will not be adequately equipped to make the informed decisions that these objectives call for.

Accordingly, we urge you to revise Policy 2025.3 consistent with these suggestions.

Thank you for considering these views.

Very truly yours

A handwritten signature in black ink, appearing to read "William S. Harris".

William S. Harris, Ph.D.  
Managing Director

A handwritten signature in blue ink, appearing to read "John H. Calvert".

John H. Calvert, J.D.  
Managing Director

cc: (w/o encl)  
Mr. Howard Persinger, Jr.  
Ms. Sandra Chapman  
Mr. Paul Morris  
Mr. Ronald Spencer  
Mrs. Barbara Fish  
Mrs. Delores Cook  
Ms. Brenda West  
Ms. Sheila Hamilton  
Dr. J. Michael Mullen  
Mr. David Stewart



## SUMMARY OF SUGGESTIONS AND IMPLEMENTING RECOMMENDATIONS

### 1. **Revise the policy to remove any implication that humans are “living objects.”**

*Implementing Recommendations.* To implement this suggestion the Policy could be revised to expand the concept of “*object*” with “*phenomena*,” “*entities*” and “*human beings*.” Thus, SC 1.4.1 could be revised to read as follows:

“SC.1.4.1 *classify objects, phenomena or entities as living or non-living.*”

### 2. **Revise the Standards to eliminate the naturalistic doctrine that natural objects and systems (natural phenomena, including life and its diversity), are not designed. Replace the doctrine with objectives that would encourage students to investigate and critically analyze the theories and evidence that supports both the design and naturalistic hypotheses.**

*Implementing Recommendations.* Replace objectives that teach that nature is not designed for teachings that seek to have students explore the scientific evidence on both sides of that issue in an objective and unbiased way. The following is a replacement objective that would accomplish that goal:

“SC 10.4.x.1 Understand the scientific evidence and arguments for and against the hypothesis that life and its diversity results only from unguided, natural processes.”

### 3. **Revise the Policy so that children are not introduced to origins science until they reach an age and maturity sufficient to fully comprehend the scientific bases for explanations and the philosophical implications of those explanations.**

*Implementing Recommendations.* Delete the following objectives in grades three through eight (together with any repetitions of those objectives during those grades): SC 3.43, SC 4.45, SC 5.46, SC 7.47, SC 7.48, and SC 8.48.

### 4. **Add explicit provisions that will encourage teachers to (a) discuss origins science objectively and without philosophic, naturalistic or religious bias or assumption and (b) help students think critically about evolutionary theory and understand the full range of scientific views that exist regarding origins of life and why origins science may generate controversy.**

*Implementing Recommendation.* An objective that would satisfy this end might be phrased like the following:

SC 10.4.x.2 Understand scientific criticisms of evolutionary theory and the full range of scientific views that exist regarding origins of life and why origins science may generate controversy.

5. **Add objectives that will require students to learn about the naturalistic assumption that is used in current origins science and the effect the assumption has on textbook explanations, particularly in light of the historical character of origins science.**

*Implementing Recommendations.* Objectives that could be incorporated into the standards to achieve this result are as follows:

- “SC 10.4.x.3 Understand that many explanations regarding the origin of life and the origin of the diversity of life are based in part on a naturalistic assumption that phenomena result only from natural causes and not by design. Understand the effect of this bias or assumption on the choice of data considered, the interpretation of data that is considered and the credibility of explanations that are provided.
- SC 10.4.x.4 Differentiate between historical sciences such as evolutionary biology and experimental sciences like physics and chemistry, understand methods used by scientists to test the credibility of historical hypotheses, understand the limitations of those methods to confirm historical explanations provided and understand how *bias* and the “*choice of what data to consider in the first place,*” may affect historical explanations.