

## **Analysis of K-12 Science TEEKS**

### **Dr. Catherine Hagen Howard**

### **Texarkana College**

Reading through the TEKS for the first time, I was very impressed. Most of my educational experience is in college teaching. Having served on several committees of The Higher Education Coordinating Board including those related to the creation and revision of the state mandated Student Learning Outcomes provided for each course in the Texas Academic Course Guide Manual, I was surprised at the depth, breadth, and specificity of the TEKS, as well as, the number of TEKS associated with each level/course. A typical college course will have five or six fairly broad student learning outcomes associated with it.

#### **Guiding Questions Responses**

1. *Is the current structure or framework of the kindergarten–grade 12 science TEKS appropriate? If not, what recommendations do you have for organizing or structuring the TEKS?*

I think the structure is appropriate. I like how the themes of scientific investigation/reasoning, matter/energy, force/motion/energy, earth/space, organisms and environment are carried through all of the grade levels up to high school. I appreciate how the early grades rely on sensual experiences gradually building up to using increasingly sophisticated measuring devices and quantifying data.

2. *Does each grade level and/or course follow a complete and logical development of science concepts presented within the grade level/course? If not, what improvements are needed?*

I think each follows a logical sequence of concepts and is appropriate for the grade level indicated. Echoing my response to #1, I like how the measuring devices and data manipulation gradually increase in complexity and precision.

3. *Are the core concepts specific to the disciplines of science (e.g., life science, physical science, and earth and space science) adequately addressed across the K–12 TEKS? If not, please identify the discipline and the concepts that are missing.*

Yes, the core concepts seem to me to be adequately addressed with nothing missing. Most of the core concepts for biology, chemistry, and physics are very similar to those we teach in introductory courses of each type on the college level.

4. *Do the standards adequately address the broader concepts that cross various science disciplines (e.g., systems and system models, energy and matter, stability and change)?*

I think the standards do an excellent job of this aspect of the TEKS in all grade levels. I appreciated the emphasis on patterns and cycles throughout the TEKS.

5. *Are there topics that should be eliminated because they no longer reflect current research or practices within the field? If so, please identify.*

I did not recognize any topics that I thought should be eliminated. I liked how recycling is discussed in grade 1.

6. *Are the TEKS vertically aligned so that concepts are introduced, elaborated on, and refined across multiple grade levels and students will possess the necessary knowledge and skills to be successful in later grades?*

Yes! Again, this was one characteristic of this work that stood out to me as excellent.

7. *Do the high school courses sufficiently prepare students for postsecondary success?*  
If these TEKS are followed, I think students will be prepared to success in college especially in my areas of biology, chemistry, and physics.

8. *The current K–5 science TEKS encourage districts to devote the percentage of instructional time to classroom and outdoor investigations as follows: kindergarten and grade 1–80%, grades 2 & 3–60%, grades 4 & 5–50%. The secondary science TEKS require districts to devote at least 40% of instructional time to laboratory and field investigations.*

*Are these designations and percentages for instructional time appropriate? Do the current student expectations adequately support the instruction?*

Since curiosity drives science, I think it's well and good to start with 80% of "lab" time in the early grades weaning down to finally 40% in high school. I think 40% is reasonable for high school level. I learned of this rule this past semester working with local schools offering dual credit through us. For college teaching, the breakdown is more 50% for lecture and 50% for lab. But I think 40% is adequate.

9. *Are the student expectations clear and specific? If not, please give examples of how the language might be improved.*

Yes. I did not notice anything that was unclear to me.

10. *Are there student expectations that are not essential or unnecessarily duplicative and can be eliminated? If so, please identify by grade level/course and student expectation number.*

Not that I noticed.

11. *What other suggestions do you have for ways in which the science TEKS can be improved?*

I don't have any further suggestions. As I said initially, not ever having seen these before this committee assignment, I'm very impressed with them.