Breaking Down a Science Standard

The *Kentucky Academic Standards for Science* maintains the vision of the *Framework for K-12 Science Education.* As such, instructional practices should focus on *conceptual understanding* of science content; not on facts and figures. When getting the intent of the standard, a key focus is on the disciplinary core ideas (DCIs). As instruction is planned and implemented the other two dimensions, the science and engineering practices (SEPs) and the cross cutting concepts (CCCs), are brought into play.

This protocol/process for getting to the intent can be thought of in three parts:

1. Coming to consensus about the conceptual understanding of a particular science concept at a given grade level
2. Outlining a progression of understanding
3. Analyzing each of the SEPs and CCCs at the identified grade band

Once these have been completed, unit and lesson planning would occur.

The protocol which follows is one way in which educators may delve more deeply into the *Kentucky Academic Standards for Science*. Each "step" has an identified purpose, as well as guiding questions, to help guide the professional conversations. No times are provided as this may stymie the deep discussions that are likely to occur. Individuals, however, may wish to set time limits.

A general flow for getting to the intent

1. Identify the disciplinary core idea component you wish to focus your discussion
2. *Individuals* review materials before meeting as a group. An organizer is provided to help in this review
3. As a *group* focus the discussion on desired conceptual understanding of the core idea
4. Begin discussions about next steps for instruction, unit planning, lesson planning. These may include
    a. Identifying a phenomenon relevant to the conceptual ideas
    b. Identifying the progression of understanding to reach the desired conceptual understanding
    c. Identifying specific learning experiences that explicitly utilize the SEPs and CCCs in service of understanding the DCIs
    d. Determining what problem, using engineering technology standards, could be incorporated
    e. Determining explicit connections to other content areas

As you become more adept at delving into *Kentucky Academic Standards for Science*, you may discover other methods and resources to help you in your analysis and ultimate planning for instruction.

Breaking Down a Science Standard Note Taker

Breaking Down a Science Standard Note Taker Example

Purpose	Materials and Guiding Questions
Review PEs and gather thoughts (*to be completed before meeting)*	• Materials – Framework (related DCI section(s)), related standards, Appendices E, F and G • *Individually*, review the agreed upon Disciplinary Core Idea Component (e.g., ESS2.A) • Record key ideas on "Getting to the Conceptual Understanding" organizer

What is the conceptual understanding required of the Standards?	• Materials –Framework, Standards, Appendices E, F, G
	• As a *group*, discuss:
	  • What is the conceptual understanding expected? Why is this important for students to know?
	  • What text evidence helps determine the conceptual understanding?
	  • What are connections to grades before and after? To which PEs/standards?

What is not in the standards? What are the boundaries?	• Materials –Framework, Standards, Appendices E, F, G
	• As a *group*, discuss:
	  • Clarification statement and assessment boundary with the identified PE(s)
	  • Introduction for the topic in DCI section of Framework
	  • DCI Progression (Appendix E)

How does the practice(s) support and allow students to demonstrate learning?	• Materials – Standards, Framework, Appendix F
	• As a *group*, discuss:
	  • What are the practices associated with the PE(s)?
	  • What will students need to experience and know with respect to the practice(s)?
	  • How do the other practices support student understanding of the science concept?

How does the cross cutting concept(s) support student understanding the core idea?	• Materials—Standards, Framework, Appendix G
	• As a *group*, discuss:
	  • What are the CCCs associated with the PE(s)?
	  • What will students need to experience and know with respect to the CCC(s)?
	  • How do the other CCCs support student understanding of the science concept?

Purpose	Materials and Guiding Questions

How might supporting standards facilitate the learning of the science?	• Materials – *Kentucky Academic Standards*, Other programs and standards (AP, ACT, content etc.)
	• As a *group*, discuss:
	  • How might literacy standards help develop understanding of the selected science standards?
	  • How might mathematics standards help develop understanding of the selected science standards?
	  • What are the connections with other content standards and programs?

Reflect	• *Individually*, share what you learned. • As a *group*, what are your next steps for planning instruction?