

PROLOGUE

The science college readiness attributes and definitions outlined in this document are a framework for preparing high school students for entry-level, general education coursework in two- and four-year colleges and universities. In addition to outlining definitions which include science content and foundational knowledge upon which to gauge college readiness, this document also identifies several overarching personal attributes that set the tone for successful college-level learning.

The college readiness attributes proposed in this document reflect *how to learn*, while the college readiness definitions reflect *what to learn*. Although the attributes and definitions are necessarily presented as separate and distinct areas, they are clearly interconnected, interdependent and necessary for success in college science courses.

College Readiness Attributes

In general education college science classes, students come from many different backgrounds and follow many different academic paths. A “college ready” student will search for the relevance of academic materials, take responsibility for his/her learning, and actively seek assistance from available resources (instructors, teaching assistants, tutoring centers, etc.) when needed. This intellectual engagement is often daunting, but by acquiring and practicing these essential attributes, students will have a greater set of tools for successful learning.

A student who possesses essential attributes necessary for college success will:

- demonstrate intellectual engagement,
- take responsibility for his or her own learning,
- persevere through the learning process,
- pay attention to detail,
- demonstrate ethical behavior,
- communicate effectively across a variety of audiences and purposes,
- effectively read and organize information presented in questions/problems in order to formulate solutions, and,
- build creative solutions to intellectual and practical real-world problems.

The acquisition and practice of these attributes are fundamental to successful learning in any college-level class as the learning process becomes more demanding, is more complex, and requires more student engagement. Also, the pace of college coursework is more rapid and the transition from small, secondary

classrooms to large, lecture-oriented college classes may work well for some students, but not all. The sheer size of some college-level classes requires students to be almost completely responsible for their own learning, which represents a distinct departure from high school. In small seminar-style classes, students should be prepared to be deeply engaged, active contributors, and to be ready for the intellectual give and take that is expected in college-level learning.

To underscore the value of the essential student attributes noted above, science, mathematics and English college readiness development teams in Washington State, have independently identified and included attributes as essential to college success.

College Readiness Definitions

In the collegiate culture, “knowledge for knowledge sake,” is highly valued, if not essential. Faculty often engage in research that may change an established body of knowledge and this manifests itself at the college level in the notion that a body of knowledge is dynamic. Therefore, students should expect that what they have already learned or believe may be challenged. Conversely, students should expect to use their learning to challenge, in a civil fashion, the “accepted wisdom” or assumptions of others from previous eras. This requires a student who wants to learn much more than “what will be on a test.” Students with such limited learning goals will find it very difficult to succeed in college-level science.

The college readiness definitions are intended to bridge the gap between K-10 learning goals and the knowledge and skills students need to be prepared for entry-level general education college science. Included below are the content areas and the foundational skills that, together, represent college readiness definitions for science.

Definition A: Science Content (“Big Ideas”)

The field of science is so broad that it does not allow for an exhaustive list of all that can or should be covered or considered important in the various science disciplines. Thus, Definition A emphasizes a student's proficiency with core science concepts—“big ideas” in science—at cognitive levels beyond those described in Washington State’s grade 10 science EALR 1. Emphasis on learning moves from primarily knowing and understanding towards synthesizing and evaluating big ideas into a coherent and useful picture of the natural world, including physical, life and earth/space sciences.

Definition B: Science Foundational Skills

Students develop scientific thinking through engagement with challenging content. This is how they seek and frame questions, form hypotheses, and consider what science does or does not know. Equally important is the ability to interpret and communicate observations and results, and ultimately to appreciate the importance of science to society. Thus, Definition B covers these science foundational skills.

- Scientific Inquiry and the Nature of Science
- Science and Society
- Quantitative Analysis
- Technology
- Communication