

## Integrated Science and the ACT

On the ACT website, the ACT is described as “an achievement test, measuring what students have learned in school.”<sup>1</sup> The test consists of 4 standard components, English (primarily mechanics), Reading (primarily comprehension), Mathematics, Science and an optional Writing component. EduChange’s Integrated Science curriculum is excellent preparation for the ACT since it not only integrates the sciences, but also requires students to develop their reading, writing, and math skills.

Let’s consider the science portion of the ACT first. One might read, “what students have learned in school” above and worry whether *any* curriculum adequately covers all the necessary content. But knowing particular content is not what the makers of the ACT mean by “learned in school.” While any science question necessarily asks about *something*, ACT science questions ask students to interpret scientific writing and representations, and to reason about natural phenomena---phenomena that students may not have studied much or at all. This focus on sense-making and reasoning is the hallmark of both levels of the Integrated Science curriculum. Certainly, learning content is a significant part of the program. But by removing forced memorization and rote/drill tests, we make more room to learn how to learn in the STEM subjects. Learning how to make sense of novel scientific material, making scientifically sound arguments, and evaluating scientific claims made by others are critical skills that students must transfer to subsequent STEM courses. *The ACT tests exactly these skills.*

All aspects of literacy—reading, writing, viewing, listening, speaking, and communicating visually---collectively comprise an integral part of the Integrated Science program. As students move through the curriculum, they deal with progressively more challenging texts across a wide range of genres, and explicitly learn and apply specific reading strategies to aid their comprehension. They also engage in a cycle of planning-drafting-revising cycle that emulates scientific peer review as well as other types of technical writing. This emphasis on literacy not only help students perform well on the Science section of the ACT, but also on the English, Reading, and Writing sections.

Like reading and writing, mathematics is a critical component of the Integrated Science curriculum. Students engage in a variety of applied mathematical tasks, including computational thinking and data analytics skills. They also become facile with scientific notation, dimensional analysis, and relevant mathematical formulas. All of this practice supports their preparation for the ACT.

As one would expect with a high-quality integrated, spiraling curriculum, students are presented with more challenging reading, writing, mathematics, engineering, and scientific content and reasoning as they progress through the Integrated Science curriculum. But based on cognitive science research, students begin to tackle these critical thinking skills from the beginning of Level I, giving them plenty of time to hone the skills that will serve them well on the ACT.

Overall, the Integrated Science program could not prepare students better for the science section of the ACT while simultaneously supporting skills that will benefit them on the remaining sections of the assessment.

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<sup>1</sup> <http://www.act.org/content/act/en/products-and-services/the-act/help.html>