



Scientific Minds<sup>®</sup>

## Development of Science Starters



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The Science Starters programs are built on sound brain research, best instructional practice, and empirical data. The company's initial product, the TAKS Science Starters for high school, was born in May of 2005. Founder Kathy Reeves, then science department chair and AP Biology/Biology teacher at a Texas high school, watched as students who struggled academically but who had good attendance in class and afterschool tutorials failed to meet the state's testing requirements and subsequently did not graduate. 2005 was the first year Texas students were required to pass a science test to graduate, and over 50,000 students across the state failed to meet the required standard that year.

Determined to help her students, Reeves spent the summer of 2005 researching best practice teaching and brain-based learning trying to put together an instructional tool that her whole department could implement. She began with the state science standards and followed Marzano's research to break them into manageable chunks of learning. Incorporating the 5E learning model and studies about memory retrieval by Jensen and Sprenger, Reeves created short PowerPoint lessons with memorable graphics and language that was clear and concise. Each lesson began with a slide intended to engage the students based on prior knowledge, prediction, etc. The lessons were constructed to spiral content, which provided constant review of prior information, with a focus on academic vocabulary and strategies for vocabulary acquisition. Each lesson also included a released test question used as formative assessment and an opportunity to teach test-taking strategies.

Teachers in the science department committed to teaching one lesson, a "Science Starter", for the first ten minutes of each period every day. The effect was profound. At the end of that year the department had significant gains and the highest science scores in the region. Struggling subpopulations showed the greatest improvement: eleventh grade economically disadvantaged students went from 51% passing in 2005 to 79% in 2006. When area educators began asking how Reeves' department had achieved these results, she began working on a product that she could sell to schools. Two summers later she had completed the first marketable Science Starters program.

Forty-one high schools purchased the program for the 2007-2008 school year, and 95% reported significant gains. Of these schools, eighteen implemented the Science Starters daily as had Reeves' department. These eighteen pilot schools had student populations that ranged from 100 to over 3,000 and demographic populations that varied from 65% African American to 98% Hispanic. Reeves tracked these high schools over two years and collected testing data. Though scores across Texas gained an average 8 percentage points from 2007 to 2009, the pilot schools saw an overall 16-point gain. Student subpopulations saw even greater gains as shown in the table below.

<b>Increase in Percentage Points (% Met Standard) for TAKS 11th Grade Science 2007-2009</b>						
Students	All	At Risk	ELL/ELP	African American	Hispanic	Econ. Disadv.
Statewide	+8	+13	+12	+12	+12	+12
Pilot Schools	<b>+16</b>	<b>+26</b>	<b>+19</b>	<b>+31</b>	<b>+16</b>	<b>+23</b>

By this time, Reeves had left teaching and begun to assemble the team that would form her educational publishing company, Scientific Minds. Reeves moved forward to create the original Middle School Science Starters, which break down grades 6-8 science standards. Like cumulative 11<sup>th</sup> grade testing, testing in middle school assesses three years of science learning at the end of the 8<sup>th</sup> grade year. Middle schools began purchasing the Science Starters program and reported similar success with its use.

Since then, the company has upgraded its Science Starters to the 2.0 platform, which delivers interactive flashcards and built-in SCORM assessment for use with student accounts, and has expanded its product line as well as its market. Scientific Minds' products are aligned to all state standards and the NGSS, and the company now sells programs for elementary science, middle school science, biology, chemistry, and agriscience to schools across the nation. Development of all programs is driven by state and national science standards. Modules have been developed with collaborative input and feedback from hundreds of science teachers, elementary through college, as well as administrators, post-secondary level advisors, and consulting PhDs.

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