EXECUTIVE SUMMARY

The Synergy of Science and English Language Arts

Means and Mutual Benefits of Integration

NGSS EARLY IMPLEMENTERS
WestEd

NGSS Early Implementers Initiative: Bringing science to life as a core subject in K–8 classrooms

A diverse group of eight California school districts and two charter management organizations is actively implementing Next Generation Science Standards in grades K–8. These NGSS Early Implementers are supported by the K–12 Alliance at WestEd, and work in partnership with the California Department of Education, the California State Board of Education, and Achieve. The S. D. Bechtel, Jr. Foundation commissions WestEd's STEM Evaluation Unit independently of the K–12 Alliance to evaluate the initiative in the eight public school districts. This document summarizes the content and findings of the second evaluation report in the initiative series, published in October 2017. Access the complete series and learn more at K12alliance.org.

Integrating science and English language arts

The NGSS Early Implementers Initiative is equipping teachers to richly integrate science and English language arts (ELA). In fact, the Common Core State Standards (CCSS) as well as the Next Generation Science Standards (NGSS) clearly call for such integration.

The nature of the NGSS and their recommended instructional approaches readily enable powerful ELA learning for all students. In a dramatic departure from science instruction that emphasizes scientific information and facts, NGSS science has students working as scientists to make sense of phenomena in the natural world. The NGSS approach requires a lot of lively discussion, critical reading, and thoughtful writing and drawing. Initiative teachers have clearly demonstrated that integrated science instruction is accessible to English learners and that these learners get strong ELA benefits from science instruction.

While the Initiative equips teachers to integrate science and ELA, it does not call for *all* science instruction to be a concerted blending of science and ELA. Indeed, teachers reported that half of their science instructional time was stand-alone science.

As a member of the State Board of Education commented during an advisory board meeting for the Initiative's evaluation: "Everyone is saying you should integrate science and ELA, but *what does that actually look like in the classroom?*" This report — intended for state and district leaders, including principals — addresses that question and several others highlighted below. To get answers, the evaluation team observed all key professional development sessions and 20 classroom lessons, surveyed over 500 teachers, interviewed Initiative leaders, and more.

How much instructional time are teachers spending on integrating science and ELA?

Almost half of the elementary teachers (45 percent) and over half of the middle school teachers (52 percent) now teach 60 minutes or more per week of science that is *integrated with ELA*. When the Initiative began three years ago, a third of the elementary-level teachers were teaching no science integrated with ELA.

What does this integration look like in the classroom?

The heart of the report, and its Appendix A, describe in some detail eight lessons that exemplify instruction integrating science and a range of CCSS-ELA. Five of the CCSS-ELA standards are now being addressed in science by a majority of the Initiative's teachers (62 to 93 percent of teachers), and all CCSS-ELA standards are being addressed by at least some percentage of the Initiative's teachers.

How are students benefitting from the integration?

While it is beyond the scope of the current evaluation to analyze students' ELA test scores, evaluators have seen and heard many examples of strong student engagement and learning through science–ELA integration. For instance, a middle school principal was particularly impressed by the students' discussion in a class working on the phenomenon of mudslides:

> *It was a totally different science class than I'd ever seen. The kids were talking about particle size, particle structure, friction. It was like little soil scientists in there talking about why a mudslide happens, and I went, "Wow this is really something!" Just the way they talked to each other and the way they listened to each other and the way they questioned each other. It was like a college class.*

And a teacher noticed a variety of benefits of integrated instruction for the English learners in her class:

> *I noticed a huge increase in the comfort of English learners with speaking, reading, and writing when these tasks included science. They were eager to participate, express their findings, and ask more questions. The students also used higher level thinking skills and a broader vocabulary, and were more willing to take chances and try new things. This exuberance for learning spread across other subjects, and they used the vocabulary in other situations.*

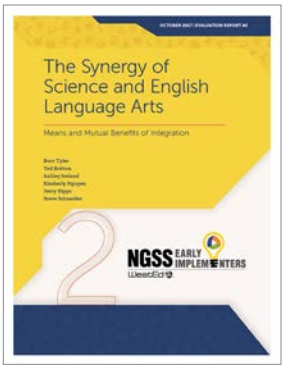
How is the Early Implementers Initiative empowering teachers to integrate science and ELA?

Almost three-quarters of surveyed teachers (72 percent) now report that the Initiative has enhanced their ability to connect CCSS and NGSS instruction by "a lot" or "moderately." The Initiative has used several approaches to empower teachers to integrate science and ELA. For instance, teachers get to experience NGSS instruction as learners: They spend about half of each annual, week-long professional development session investigating science phenomena, including working with consultant scientists. The Initiative also helps teachers use several tools and strategies that promote both ELA and science learning, including: using the 5E instructional model to scaffold lessons; helping students make sense of science through writing in science notebooks; and using Claims, Evidence, and Reasoning (CER) and questioning strategies to promote critical thinking and productive writing, speaking, and listening. In addition, the Initiative is supporting teachers by directly engaging their principals.

Recommendations to administrators for supporting science–ELA integration

About two-thirds (65 percent) of Early Implementer teachers now report that their principals are "very" or "somewhat" supportive of their teaching science integrated with ELA during time allotted for ELA. On the other hand, this summer (2017), almost half (47 percent) of Initiative teachers still identified "prioritization of other school subjects" as one of their three biggest barriers to implementing the NGSS.

In order to implement the CCSS and the NGSS as intended, administrators should advocate integration of ELA and science instruction and actively support teachers in accomplishing it. At a minimum, administrators need to endorse counting integrated science–ELA instruction as some part of required ELA instructional time. In districts with prescriptive ELA programs, it is in both their ELA and NGSS interests to find ways to allow flexibility for science–ELA integration. Early Implementer administrators who observed some integrated science–ELA instruction felt much more empowered to be active promoters and supporters of integration.



Read the full report, access other evaluation reports and resources, and learn from NGSS Early Implementers at K12alliance.org.