

LEGO® Education Science Case Study

Increasing Teacher Confidence in Science Instruction

Imagine: A grade-level team of teachers is eager to deliver engaging hands-on lessons for all students. They want their students to “do” science. However, significant challenges limit their opportunity to transform this vision into reality.

Many K–8 teachers lack the time and resources required for hands-on science lessons, leading them to default to worksheets and other familiar but less engaging approaches for addressing science standards. The prospect of managing materials, setup, and cleanup within limited instructional time feels overwhelming, especially when they are already stretched thin across many responsibilities, and sometimes multiple subjects.

Teachers have precious few minutes to prepare science lessons, yet many hands-on solutions require extensive material gathering. Picture a teacher racing to the store at night on a quest to buy baking soda for tomorrow’s experiment, adding stress to an already demanding schedule.

For many educators, particularly in K–5 settings, the challenge intensifies because they aren’t science specialists. Despite their eagerness to bring memorable lessons to their students, they face the daunting task of researching inquiry-based activities along with creating lesson plans, presentations, and assessments that align with district curriculum and local standards. Too often, these hurdles become insurmountable barriers to delivering engaging, standards-aligned science experiences.



Testing a New Approach: Ready-to-teach Resources with Built in Flexibility

Recognizing these challenges, we wondered: what would happen if K–8 teachers had flexible, ready-to-teach, hands-on science lessons that eliminate preparation demands while seamlessly fitting into existing instructional time and aligning to local science standards?

This is one of the key questions that led to the development of LEGO® Education Science. By design, it is a robust science program that includes teaching resources for time-strapped teachers and administrators who need flexible, hands-on tools to instantly engage students in learning. The curriculum offers student-led, inquiry-based science experiences delivered through hands-on lessons that follow the 5E framework while aligning with local state standards as well as Next Generation Science Standards (NGSS).

At the heart of our approach lies the [learning through play](#) methodology.¹ LEGO Education champions this research-backed pedagogy. When students learn through play, they experience joyful, interactive experiences that develop not only academic knowledge and skills, but also creativity, collaboration, and problem-solving skills that help them grow and thrive. This approach ensures learning is:

- **Joyful:** The joy of discovery increases dopamine that makes the learning process feel enjoyable.
- **Meaningful:** By linking new experiences to prior knowledge, students expand their grasp of the world and build new connections in the brain.
- **Actively engaging:** When children take charge of their learning, they develop executive control skills like focusing, planning, remembering instructions, and prioritizing tasks.
- **Iterative:** Adapting and improving creations helps students develop flexible, innovative thinking.
- **Socially interactive:** Building collaborative relationships helps improve students' mental health and teaches them how to collaborate and build empathy.

The LEGO Education Science program integrates playful learning into 120 standards-aligned lessons, supported by an online teacher portal with ready-to-use teaching resources and hands-on materials including LEGO® bricks and wireless hardware. The program offers structured collaborative learning experiences in which students work in groups of four with defined roles, driving collaboration, communication, and engagement.

In addition to learning through play, these three frameworks inform the design of LEGO Education Science:

- **Constructivism and constructionism:** Knowledge is constructed through hands-on activities and meaningful creation of physical models with peer interaction and teacher guidance.
- **Guided inquiry with the 5E model:** Scientific phenomena investigations follow the Engage, Explore, Explain, Elaborate, and Evaluate framework to build understanding gradually.
- **Universal Design for Learning:** Lessons are created to include multiple modes of representation, engagement, and expression that support accessibility and flexibility for all students

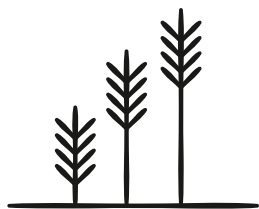
During the development of LEGO Education Science, it was incredibly important to ensure teachers found the program intuitive and supportive. We tested LEGO Education Science in K–8 science classrooms across the United States. The aim was to explore teacher perspectives on program quality, impact on teaching confidence, and ease of preparation and integration into existing science curricula, and the results were telling.

Key Takeaways: LEGO Education Science Is Flexible and Intuitive

- **Ready-to-use resources:** 100% of teachers rated the digital resources (lesson pages, classroom presentations, and facilitation notes) as “very” or “extremely” easy to use.
- **Intuitive tools:** Teachers gave the LEGO® Education Teacher Portal an “excellent” usability rating.
- **Low-lift lesson prep:** 98% of all teachers’ lesson evaluations rated the lessons as “very” or “extremely” easy to prepare.
- **Increased teacher confidence:** After just five lessons, teachers’ confidence in their science teaching abilities and beliefs about their impact on student learning increased by 9.6%.

The Case Study

A recent study exploring the implementation of LEGO Education Science in diverse classrooms across the United States provides some insights and answers about the program’s flexibility and usability. LEGO Education employed an embedded case study design to test LEGO Education Science in diverse, real-world classroom settings in which teachers and students worked through five LEGO Education Science lessons.



Case Study Snapshot

- **Timeframe:** Spring 2025 (2.5 months)
- **Districts:**
 - Compton Unified School District, CA
 - Irving Independent School District, TX
 - Northeastern School District, PA
- **School profiles:** Title 1 schools with large populations of multilingual learners, students receiving special education services², and those eligible for free or reduced-price lunch
- **Participants:**
 - 9 teachers with varied experience
 - » 3–31 years of science teaching experience
 - » 5 generalists; 4 departmentalized
 - 201 students
 - » 64 in grades 1–2,
 - » 64 in grades 3–4, and
 - » 73 in grades 6–7
- **Data collection methods:**
 - At the beginning and end of the study:
 - » Teachers completed the T-STEM Science Scale assessing science teaching self-confidence.
 - After each lesson:
 - » Teachers completed post lesson evaluations of lesson usability, effectiveness, and modifications made using 5-point rating scales.
 - At the end of the study:
 - » Teachers completed a survey assessing their overall perceptions of LEGO Education Science and how it compared to traditional science lessons using a 5-point rating scales and multiple-choice questions.
 - » Teachers also participated in interviews exploring their teaching experiences with LEGO Education Science.

Research Findings: Intuitive Flexibility and Enhanced Teacher Confidence

While early elementary teachers reported the greatest ease of use, positive perceptions were consistent across all grade levels. Several teachers noted that lessons were “plug-and-play” and increased their ability to teach science with confidence.

Rapid Gains in Teaching Confidence

Teachers quickly gained confidence using LEGO Education Science, with most reporting they felt confident after just one lesson. This pattern remained consistent across grade levels, and teachers attributed this to the program’s clarity and ease of use.

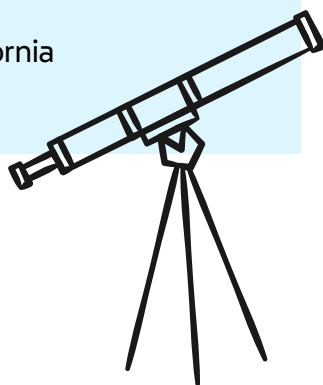
All teachers received one day of LEGO Education Science professional learning followed by one two-hour coaching session—both of which are recommended, but not required, for all teachers getting started with LEGO Education Science. The professional learning sessions supported the growth in confidence that teachers experienced, with eight out of nine teachers reporting that the sessions prepared them “very” or “extremely” well.



Clear facilitation notes and teacher resources helped teachers implement the curriculum with confidence.

“I felt really confident. I didn’t have any apprehension. I felt it was really laid out. The facilitator notes were great.”

—Amber Holloway
Grade 7 teacher in California



Enhanced Teacher Efficacy

After implementing just five lessons, teachers experienced substantial improvements in their science teaching confidence. Overall, teachers’ confidence in their science teaching abilities and beliefs about their instructional impact increased by nearly 10% on a standardized measure of teaching self-confidence.³ This modest but meaningful improvement was driven by growth in their beliefs that they can teach science effectively and their teaching practices can positively influence each student.

Flexible Cross-curricular Integration and Curriculum Alignment

In interviews, teachers reported that LEGO Education Science lessons aligned well with science standards (e.g., NGSS, TEKS, STEELS), cross-disciplinary goals—including English Language Arts integration in grades 1–4—and their broader instructional contexts, enhancing feasibility and coherence of implementation in their classrooms.

Teachers valued the flexibility to integrate LEGO Education Science into other subject areas like English Language Arts and math. Elizabeth Wolff (Grade 2 teacher, PA) and Anthony Griffin (Grade 1 teacher, CA) embedded lessons into English Language Arts class periods, while Maryfe Del Mar (Grade 3 teacher, CA) mapped lessons to Amplify Science and Project Lead the Way.

To address the learning needs of her classroom, Elizabeth Wolff chose to schedule Evaluation phases separate from hands-on building to maintain momentum while capturing student thinking through writing. She noted that one lesson worked particularly well with an English Language Arts unit she was teaching.

Teachers thoughtfully integrated lessons into their core science curriculum, guided by professional learning support provided by LEGO Education certified trainers. This cross-curricular adaptability made the program a valuable supplement to existing instruction.

Implementation Considerations

The few challenges teachers reported related to implementation were primarily pedagogical: managing time, addressing knowledge gaps, and supporting concept transfer.

While most teachers rated the ease of lesson preparation very highly—98% of all teachers' lesson evaluations rated the lessons as "very" or "extremely" easy to prepare—there was some variance in the amount of time teachers spent on lesson preparation. In post-study interviews, teachers reported spending anywhere from 15 minutes to an hour preparing to teach a lesson. Some teachers shared that they spent additional preparation time adding supplemental resources such as videos or mapping cross curricular connections.

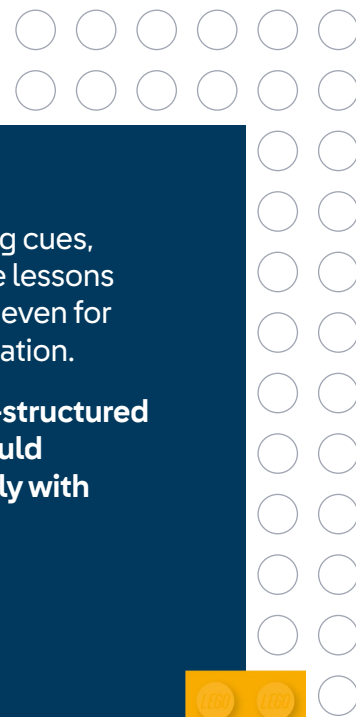
Additionally, technical issues were rare and easily resolved, suggesting the core design of LEGO Education Science is robust and intuitive.



Conclusions and Implications

The LEGO Education Science program successfully bridged the persistent gap between rigorous, standards-aligned content delivery and the flexibility teachers need to deliver engaging hands-on lessons for all students. Teachers found preparation and implementation refreshingly straightforward, and all teachers in the case study noted they were extremely likely to recommend LEGO Education Science to another teacher.

Perhaps most encouraging was witnessing how teacher confidence transformed when barriers were removed. By providing educators with intuitive, flexible science resources paired with thoughtful LEGO Education professional learning sessions, we observed a remarkable enhancement in professional efficacy: a 9.6% increase in teaching confidence that represents meaningful professional growth achieved through just five lessons.



Clear facilitation notes, pacing cues, and visual supports made the lessons easy to prepare and deliver—even for educators new to LEGO Education.

"The materials were so well-structured that even first-time users could implement them successfully with minimal prep."

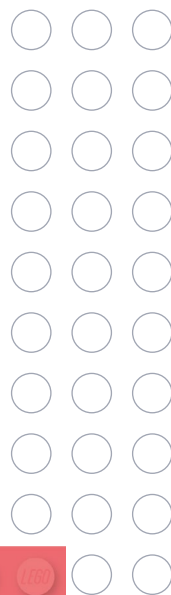
—Peter Rodarte
Grade 6 teacher in Texas



Supporting Curriculum Integration

Teachers discovered they could seamlessly weave LEGO Education Science lessons across subject areas while maintaining strong learning objectives. This helped minimize the time typically required for creating robust, interconnected experiences. This integration potential offers schools valuable implementation flexibility and maximizes curricular connections in ways that feel natural rather than forced.

For K–8 administrators and science teachers seeking programs that balance content rigor with instructional flexibility, these findings offer encouraging evidence that this well-designed, research-informed science curriculum can successfully meet both needs. The exceptional usability ratings and reported increase in teacher confidence tell a compelling story about what becomes possible when we remove practical barriers and empower educators with tools designed for real classrooms. This suggests promising potential for broader implementation of LEGO Education Science to support teacher growth and meaningful student learning.



1. "Learning through play: what the science says." The LEGO Foundation, 2025. <https://learningthroughplay.com/explore-the-research/the-scientific-case-for-learning-through-play> (accessed 3 September 2025).
2. "Office of Special Education Programs (OSEP)." U.S. Department of Education. U.S. Department of Education, October 24, 2024. <https://www.ed.gov/about/ed-offices/osers/osep> (accessed 3 September 2025).
3. The standard of measure used was the Teaching Science as Inquiry – Teacher Efficacy and Beliefs (T-STEM Science) scale.