Making Sense of SCIENCE

Transforming Science Classrooms

IMPACT BRIEF

When we support teacher learning, classrooms become places for inspired science learning and students are prepared for a successful future.

A rigorous Investing in Innovation study carried out with several hundred 4th and 5th grade teachers from seven districts across two states led by external research teams from Empirical Education and Heller Research Associates has revealed the impact of Making Sense of SCIENCE on students' opportunities to learn. There were changes in what science content students were learning and how teachers guided science instruction. There was an increase in how often and for how long students experience next generation science — learning that allows students to explore phenomena and answer questions using the practices of scientists and engineers. This large-scale study meets a high bar of statistical significance, which leaves researchers confident these profound changes are the result of Making Sense of SCIENCE.

Changes in *What* Students Learn

New science standards ask teachers to change what students learn. But making these big shifts is not easy. After two years with Making Sense of SCIENCE, more than 80% of teachers reported changing the science they taught to align with the new science standards, as compared to less than 25% of teachers at the start of the study. Their students had more opportunities to learn core science ideas and figure things out using scientific and engineering practices.

Changes in *How* Students Learn

Great science isn't about how many facts a teacher has memorized — it's about students using science to understand their world. Making Sense of SCIENCE teachers provide more hands-on activities and fewer lecture-based lessons. They increase opportunities for students to learn collaboratively and engage in scientific discourse. They integrate literacy with science learning.

Classroom Outcomes

Modern Content
Standards-aligned science is taught more often, along with more opportunities to develop literacy and math skills.

Engaging Instruction
Instruction is meaningful and cognitively challenging with more opportunities to make sense of hands-on activities and learn science through reading, writing, and discourse.

Increased Time
Students spend more class time learning science.

Classroom Climate
The classroom environment is more conducive to learning, reflects high expectations, and fosters greater engagement.

Transformed Classroom Practices

My students are really excited to *be* scientists and engineers. They love that they don't have to know the correct answer right off the bat or build a perfect device the first time. They get to investigate their ideas more to understand them or rebuild design solutions that don't hit the mark the first time.

— Amy Bass
4th & 5th grade teacher
Manteca, CA

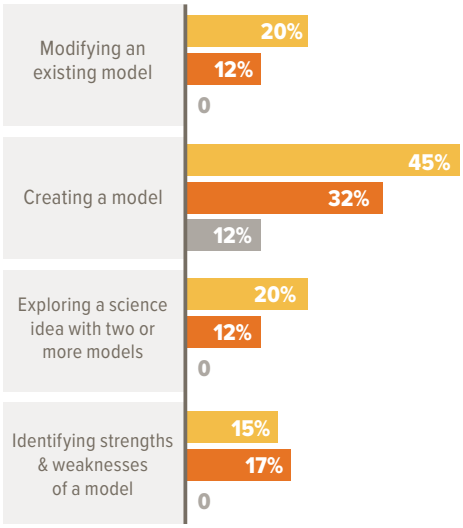
When teachers described their last three science lessons as part of the In the Investing in Innovation study. Making Sense of SCIENCE **teachers** and **teacher leaders** (who received additional leadership development) placed heavier emphasis than the **control teachers** on students learning next generation science practices including scientific argumentation, use of models and modeling, and on building core literacy practices and a deep understanding (i.e., exploring real-world phenomena, constructing explanations, reflecting on learning).

In this study and a separate video study spanning multiple states, Making Sense of SCIENCE teachers changed their instruction with more focus on:

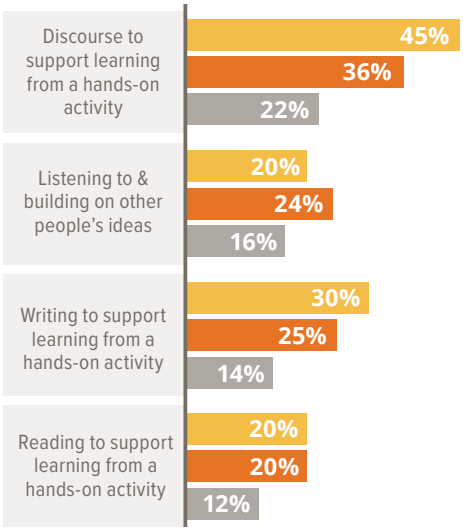
- Conceptual understanding
- Sense-making activities
- Collaborative discourse
- Attention to student thinking
- Integration of science and literacy

Scientific Argumentation

Use of Models & Modeling



Literacy Practices



Meaningful Impact on Students and Systems

Re-inspired teachers and leaders build systems of transformative teaching and learning. Impact expands beyond one science classroom closing gaps in science education and beyond.

Districts and states who partnered with Making Sense of SCIENCE in the Investing In Innovation study were both empowered and equipped to support the implementation of new science standards.

The New Mexico Public Education Department built a deep bench of trained science leaders to facilitate professional learning. These facilitators provided professional learning across vast geographic regions and measurably increased teachers' science knowledge.

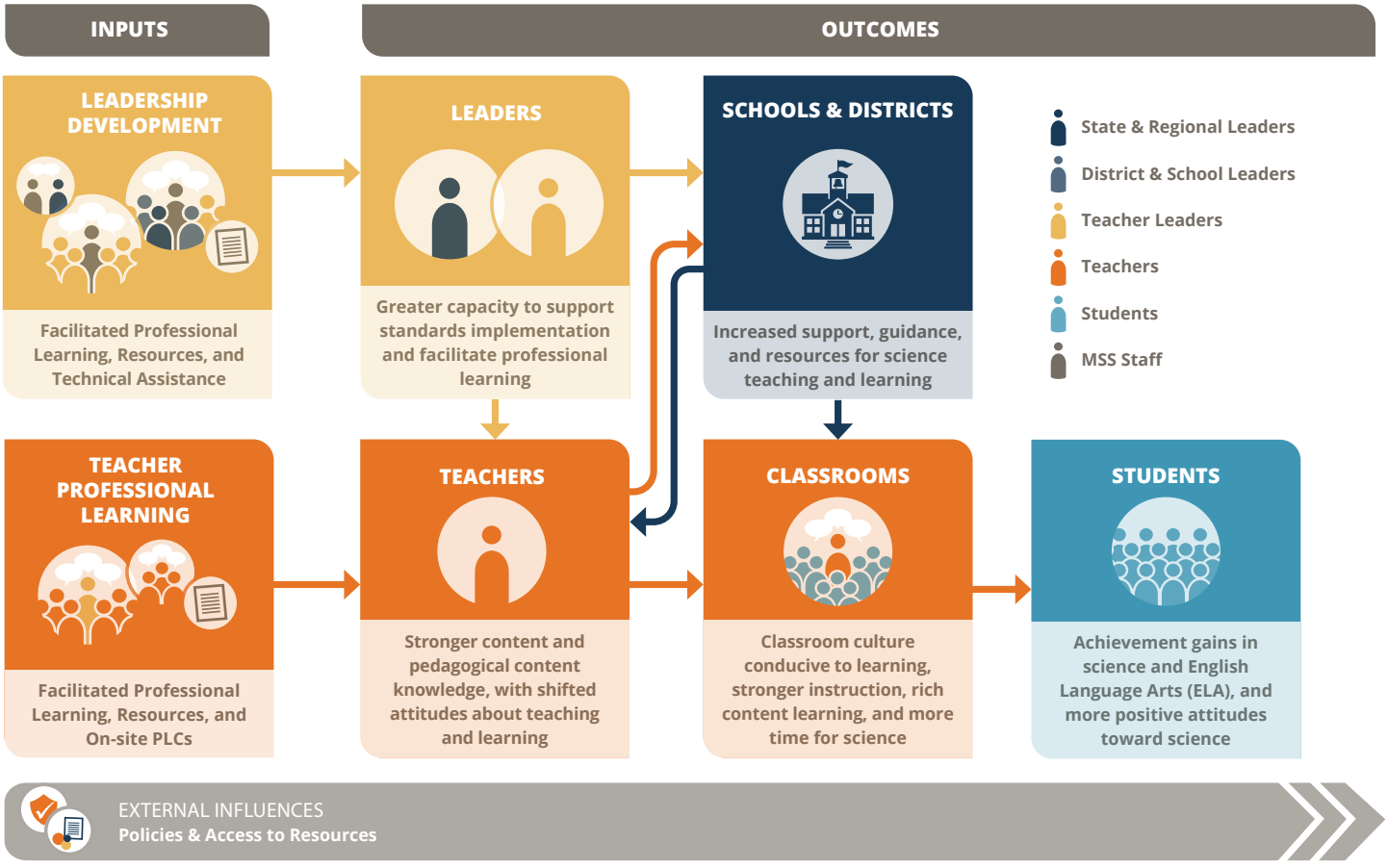
In California, district science leaders leveraged resources to expand Making Sense of SCIENCE professional learning from upper elementary grades to reach teachers K–12.

When a rural community partnered with Making Sense of SCIENCE, they used their enhanced leadership skills to write a grant, form a non-profit, and bring engaging professional learning to their remote communities.

In another study, Arizona teachers from 11 districts participated in Making Sense of SCIENCE for two years. Their 8th grade students made greater gains on the state test compared to students in control classrooms — gains equivalent to nearly 6 additional months of learning!

Yet another study with elementary teachers from six states found students of participating teachers outperformed students of control teachers by more than 40% — with non-native English speakers gaining more than native speakers and low-performing students making the biggest gains.

Making Sense of SCIENCE Logic Model



About Making Sense of SCIENCE

We believe that everyone deserves to experience the thrill of collaborative scientific exploration, first-hand. Every day, we help shift mindsets about how exciting teaching and learning science can be. We do this because research proves that learning to think like a scientist develops the abilities that students, teachers, and leaders need to solve our biggest challenges and create positive change.

Too frequently professional learning misses the mark and doesn't deliver on its promise for teachers or students. With budgets for professional learning so lean, it's imperative that investments produce results that resonate across schools, districts, and states. Making Sense of SCIENCE study data prove that professional learning that re-inspires teachers not only transforms their teaching, but also leads systemic change as their inspiration ripples outward.

Making Sense of SCIENCE

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Products & Services
Making Sense of SCIENCE develops and delivers customized professional learning for pre-service teachers, in-service teachers, coaches, administrators, and leaders that has profound effects on teachers, students, and entire districts and states.

Visit our **Products and Services** page to learn more. For personalized support, contact us at **mssevents@wested.org** or **510-302-4210.**

Thought Leadership & Research
Our professional learning programs have system-wide impact — and we have the data to prove it. Read one of our many **research reports,** including the reports for the studies highlighted in this brief.

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