



What's Your Evidence?: Engaging K-5 Children in Constructing Explanations in Science (Pearson Professional Development)

By Carla L. Zembal-Saul, Katherine L. McNeill, Kimber Hershberger

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By providing a variety of strategies, scenarios, student samples, classroom video clips from across all science content areas, rubrics, and guidelines this book provides teachers with the tools to successfully support young scientists to use evidence to construct scientific explanations.

With the view that children are capable young scientists, authors encourage science teaching in ways that nurture students' curiosity about how the natural world works including research-based approaches to support all K-5 children constructing scientific explanations via talk and writing. Grounded in NSF-funded research, this book/DVD provides K-5 teachers with a framework for explanation (Claim, Evidence, Reasoning) that they can use to organize everything from planning to instructional strategies and from scaffolds to assessment. Because the framework addresses not only having students learn scientific explanations but also construct them from evidence and evaluate them, it is considered to build upon the new NRC framework for K-12 science education, the national standards, and reform documents in science education, as well as national standards in literacy around argumentation and persuasion, including the Common Core Standards for English Language Arts (Common Core State Standards Initiative, 2010). The chapters guide teachers step by step through presenting the framework for students, identifying opportunities to incorporate scientific explanation into lessons, providing curricular scaffolds (that fade over time) to support *all* students including ELLs and students with special needs, developing scientific explanation assessment tasks, and using the information from assessment tasks to inform instruction.

ABOUT THE VIDEO

All of the video clips associated with this text were filmed in elementary grade classrooms in central, rural Pennsylvania. None of the lessons were staged or scripted. The video was not professionally recorded or produced given that our

aim was to be as non-intrusive as possible in the classrooms in which we were guests. Permissions were secured for all students and teachers appearing in the video clips. We hope those that view the videos are as grateful as we are that these teachers were willing to share their attempts to integrate scientific explanation into their science teaching practices, providing us with insights that would not be possible without these images. They are the true heroes of this work. - **Carla L. Zembal-Saul, Katherine McNeill, and Kimber Hershberger**

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Editorial Review

Review

“I highly endorse this book and the practices it promotes for science explanations and discourse. As a learning tool for teachers, it will truly enhance the way they guide children to think, participate and talk like scientists.”

—from the Foreword by Donnan Stoicovy, Principal/Lead Learner, Park Forest Elementary School, State College, PA

From the Back Cover

***What's Your Evidence?: Engaging K-5 Children in Constructing Explanations in Science*
Carla L. Zembal-Saul, Katherine L. McNeill, and Kimber Hershberger**

Successfully integrate scientific explanation into the classroom with a wealth of strategies including scenarios, examples of student writing, classroom video clips from across all science content areas, rubrics, and guidelines for designing assessment items.

This exciting new resource presents K-5 teachers with an effective framework that breaks down the complex practice of scientific explanation into four components—claim, evidence, reasoning, and rebuttal. Their model provides teachers with a concrete roadmap for enhancing students conceptual understanding and improves their ability to think and communicate more scientifically by carefully analyzing evidence and backing up their claims. Teachers will learn how to adapt their science content instruction in order to better meet the needs of all students.

“I highly endorse this book and the practices it promotes for science explanations and discourse. As a learning tool for teachers, it will truly enhance the way they guide children to think, participate and talk like scientists.” —from the Foreword by Donnan Stoicovy, Principal/Lead Learner, Park Forest Elementary School, State College, PA

Carla Zembal-Saul is a Professor of science education in the College of Education at Penn State where she holds the Kahn Professorship in STEM Education and currently serves as head of the Department of Curriculum and Instruction. A former middle school science teacher, she has been involved in school-university partnership work for more than fifteen years. Examining classroom discourse is a fundamental aspect of Professor Zembal-Saul's work and she employs video analysis as both a research tool and a pedagogical approach for working with teachers. She has published her research findings in numerous book chapters and articles in peer-reviewed journals, and she is active in professional organizations, including the National Association for Research in Science Teaching and the National Science Teachers Association. Carla Zembal-Saul earned her doctorate at the University of Michigan.

Katherine L. McNeill is an Assistant Professor of science education at Boston College. A former middle school science teacher, she received her doctorate in science education from the University of Michigan. Her research focuses on how to support students with diverse backgrounds in engaging in scientific explanation and argumentation in both talk and writing. Her research has been generously funded by the National Science Foundation (NSF) and from this work, she has authored a book on supporting middle school students, along with numerous book chapters and articles in a variety of journals. In 2011, Professor McNeill received the Early Career Research Award from NARST.

Kimber Hershberger is currently a third grade teacher in the State College Area School District (SCASD) in Pennsylvania. She also serves as co-instructor for the science methods course and a mentor teacher for the Penn State — SCASD Professional Development School Partnership. Her involvement in a local professional learning community that focuses on incorporating content storyline and the CER framework in science teaching has been a highlight of her work. She holds degrees from Juniata College (B.S., elementary education) and Penn State University (M.Ed., science education). In addition to presenting numerous times at the annual conference of the National Science Teachers Association, she has co-authored several articles for NSTA journals, including *Science and Children* and *Science Scope*.

About the Author

Carla Zembal-Saul is a Professor of science education in the College of Education at Penn State where she holds the Kahn Professorship in STEM Education and currently serves as head of the Department of Curriculum and Instruction. A former middle school science teacher, she has been involved in school-university partnership work for more than fifteen years, and most of her teaching, scholarship, and service take place in that context. Her research focuses on K-6 teacher learning as they engage in professional development aimed at supporting students in talking and writing evidence-based arguments in science. Examining classroom discourse is a fundamental aspect of Professor Zembal-Saul's work and she employs video analysis as both a research tool and a pedagogical approach for working with teachers. She has published her research findings in numerous book chapters and articles in peer-reviewed journals, and she is active in professional organizations, including the National Association for Research in Science Teaching and the National Science Teachers Association. Carla Zembal-Saul earned her doctorate at the University of Michigan.

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Kimber Hershberger is currently a third grade teacher in the State College Area School District (SCASD) in Pennsylvania. She also serves as co-instructor for the science methods course and a mentor teacher for the Penn State – SCASD Professional Development School Partnership. Her involvement in a local professional learning community that focuses on incorporating content storyline and the CER framework in science teaching has been a highlight of her work. She holds degrees from Juniata College (B.S., elementary

education) and Penn State University (M.Ed., science education). Kimber Hershberger has co-authored several articles for NSTA journals, including *Science and Children* and *Science Scope*. In addition, she has presented numerous times at the annual conference of the National Science Teachers Association, including sessions at the Research Dissemination Conference, about her work on how to scaffold students' use of claims and evidence through science talks and journals. She loves visiting interesting places like the Galapagos Islands, India, Italy, and Japan and sharing her travel adventures with her students.

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