

Stem Student Research Handbook Pb297x

Author Page Keeley continues to provide KOC012 teachers with her highly usable and popular formula for uncovering and addressing the preconceptions that students bring to the classroom. In this first book devoted exclusively to life science in her Uncovering Student Ideas in Science series, Keeley addresses the topics of life and its diversity; structure and function; life processes and needs of living things; ecosystems and change; reproduction, life cycles, and heredity; and human biology."

When it's time for a game change, you need a guide to the new rules. *Helping Students Make Sense of the World Using Next Generation Science and Engineering Practices* provides a play-by-play understanding of the practices strand of A Framework for K–12 Science Education (Framework) and the Next Generation Science Standards (NGSS). Written in clear, nontechnical language, this book provides a wealth of real-world examples to show you what's different about practice-centered teaching and learning at all grade levels. The book addresses three important questions: 1. How will engaging students in science and engineering practices help improve science education? 2. What do the eight practices look like in the classroom? 3. How can educators engage students in practices to bring the NGSS to life? *Helping Students Make Sense of the World Using Next Generation Science and Engineering Practices* was developed for K–12 science teachers, curriculum developers, teacher educators, and administrators. Many of its authors contributed to the Framework's initial vision and tested their ideas in actual science classrooms. If you want a fresh game plan to help students work together to generate and revise knowledge—not just receive and repeat information—this book is for you. Electronic publishing and electronic means of text and data presentation have changed enormously since the first edition of this book was published in 1997. The third edition of *Scientific Papers and Presentations* applies traditional principles to today's modern techniques and the changing needs of up-and-coming academia. Topics include designing visual aids, writing first drafts, reviewing and revising, communicating clearly and concisely, adhering to stylistic principles, presenting data in tables and figures, dealing with ethical and legal issues, and relating science to the lay audience. This successful legacy title is an essential guide to professional communication, provides a wealth of information and detail and is a useful guide. Covers all aspects of communication for early scientists from research to thesis to presentations. Discusses how to use multi-media effectively in presentations and communication. Includes an extensive appendices section with detailed examples for further guidance.

"The idea that Earth is shaped by dynamic and ongoing geologic processes is a powerful one for a scientifically literate society to understand. This module focuses on helping students understand more about this idea: Knowing that flooding,

earthquakes, and volcanoes can alter the landscape in a short amount of time will help students recognize the inherent risks of living in specific locations around the globe. Understanding the impact that the geology of an area plays on the establishment of a community will help students better appreciate the challenges communities face and the diversity in culture that arises as a result of the geology. And recognizing that some short-term events (e.g., earthquakes and volcanoes) have underlying causes that are modifying Earth on a much longer time scale is critical for students to better understand our place on this planet"--

"This book teaches student teams how to use the engineering design process to plan, construct, and test their own system for collecting and reusing rainwater to irrigate a fictional community garden."--

"Through 19 carefully sequenced lessons and activities, this unit gets middle schoolers ready for next-level learning. Students explore what happens at the molecular level so they can understand how living things grow and repair their body structures. Using Legos, ball-and-stick models, videos, and print manipulatives helps them retain what they learn so they can apply that knowledge later."-- Page [4] of cover.

The popular features from Volume 1 are all here. The field-tested probes are short, easy to administer, and ready to reproduce. Teacher materials explain science content and suggest grade-appropriate ways to present information. But Volume 2 covers more life science and Earth and space science probes. Volume 2 also suggests ways to embed the probes throughout your instruction, not just when starting a unit or topic.

Covering the entire fundraising process, this comprehensive text offers a wealth of practical strategies for pursuing "big time" grants and gifts for America's public schools.

Written by and for nurses, this key foundational text helps to build the fundamental economics and financial management skills nurses and nurse leaders need for daily use. This third edition delivers several new features, adding to its value as the only timely and relevant text written for the full spectrum of RN-to-BSN, BSN, and MSN students. It has been significantly revised to simplify content, to address the vast changes in and increasing complexity of U.S. health care financing, and to be useful in both traditional in-class format and hybrid and online programs. Two new and refocused chapters address assessing financial health and nurse entrepreneurship and practice management, and new material illuminates recent research findings and statistics. Chapters feature worksheets such as business plan checklists and text boxes expanding on key chapter content. The book is distinguished by its provision of case examples based on nurse-run clinic and inpatient nursing unit financial issues. It provides multiple opportunities for experiential learning, such as writing business plans and health program grant proposals. It delivers cost-benefit and cost-effectiveness analyses, discusses budget preparation, offers strategies for controlling budget costs, and updates relevant health policies and statistics. The text's engaging format promotes the synthesis of economics and finance across the nursing curriculum through the use of end-of-chapter exercises, discussion questions, and games based on concepts within the text. Additionally, tips throughout the book alert students about the need to apply concepts from other aspects of their education to economic and financial situations. Also included are online supplemental materials for teachers and students, including Excel spreadsheets, grant

proposals, a test bank, and PowerPoint slides. New to the Third Edition: Updates health reform, health care spending, and other relevant policies and statistics Includes two new and refocused chapters that address assessing the financial health of a business and nurse entrepreneurship and practice management Highlights recent research findings and key concepts in text boxes Provides blank and completed worksheets, such as business plan checklists, so nurses can apply financial concepts in their clinical settings Fosters understanding of key concepts with enhanced explanations and samples of business plans and other reports Key Features: Aligned with AACN and AONE guidelines, the CNL certification exam, and QSEN competencies Serves as a primary financial management text for multiple nursing academic programs Facilitates experiential learning through end-of-chapter exercises, games, tips for synthesizing knowledge, worksheets, and case examples Designed for use in traditional classrooms and in hybrid and online learning programs Includes a chapter on measuring nursing care with indicators for capacity, staffing, patient acuity, performance, and patient flow NEW! a FREE Q&A App is available (see inside front cover)

Because the activities have been field-tested by more than a thousand Head Start teachers over 10 years, you'll find this collection unusually easy to use in a variety of settings, including elementary schools, pre-K programs, and day care. Each activity ends with a reproducible Family Science Connection—in both English and Spanish.

Using probes as diagnostic tools that identify and analyze students' preconceptions, teachers can easily move students from where they are in their current thinking to where they need to be to achieve scientific understanding.

From the very first day you use them, the design challenges in this compendium will spur your students, too, to jump right in and engage throughout the entire class. The activities reinforce important science content while illustrating a range of STEM skills. The 30 articles have been compiled from NSTAOCO's journals for elementary through high school. Next time you need an engaging STEM activity, you'll be glad you have this collection to help you blend meaningful and memorable experiences into your lessons."

For teachers eager to integrate STEM into their school day, *Picture-Perfect STEM Lessons* is an exciting development. This book's 15 kid-friendly lessons convey how science, technology, engineering, and mathematics intersect in the real world. They embed reading-comprehension strategies that integrate the STEM subjects and English language arts through high-quality picture books. You'll help your 3-5 students engage in STEM activities while learning to read and reading to learn. This volume of *Picture-Perfect STEM Lessons* for the upper-elementary grades uses a remarkable variety of books to teach STEM concepts and reading comprehension strategies. For example, you can pique students' interest with *The Inventor's Secret*; *An Ambush of Tigers*; and *Trash to Treasure: A Kid's Upcycling Guide to Trash*. Then, through the accompanying lessons, you can teach ways to plan and carry out investigations; analyze and interpret data; and construct explanations and design solutions. Along the way, your students will invent toy cars, learn how scientists use technology to track individual animals within larger groups, figure out how to reduce plastic pollution, and tackle other real-world projects. Engaging fiction and nonfiction books plus 15 hands-on lessons add up to perfect ways to learn about the interdependence of the STEM areas. Along with these new lessons come the easy-to-use features that have made *Picture-Perfect* a bestselling series for more than a dozen years: Fiction and nonfiction book pairs Background reading, materials lists, student pages, and assessments for each lesson Connections to science standards and the Common Core State Standards for both English language arts and mathematics. *Picture-Perfect STEM* is a powerful tool for guiding instruction. You'll love how effective this book is, and your students will love learning about STEM.

What do your students know or think they know about what causes night and day, whether the Moon orbits the Earth, and why the Sun keeps glowing? Find out with this book on astronomy, the latest in NSTA's popular Uncovering Student Ideas in Science series. The 45 astronomy probes provide situations that will pique your students' interest while helping you evaluate their understanding (or misunderstanding) of how the universe operates. The book is organized into four broad sections: the Earth and gravity; the Earth, Sun, and Moon system; the solar system and gravity in space; and stars, galaxies, and the universe. As the authors note, it's not always easy to help students untangle mistaken ideas. Using this powerful set of tools to identify students' preconceptions is an excellent first step to helping your students achieve scientific understanding.

STEM Student Research Handbook National Science Teachers Association Scientific Papers and Presentations Academic Press
In this newly revised and expanded 2nd edition of *Picture-Perfect Science Lessons*, classroom veterans Karen Ansberry and Emily Morgan, who also coach teachers through nationwide workshops, offer time-crunched elementary educators comprehensive background notes to each chapter, new reading strategies, and show how to combine science and reading in a natural way with classroom-tested lessons in physical science, life science, and Earth and space science.

Like all enthusiastic teachers, you want your students to see the connections between important science concepts so they can grasp how the world works now, and maybe even make it work better in the future. But how exactly do you help them learn and apply these core ideas? Just as its subtitle says, this important book aims to reshape your approach to teaching and your students' way of learning. Building on the foundation provided by *A Framework for K-12 Science Education*, which informed the development of the Next Generation Science Standards, the book's four sections cover these broad areas: Physical science core ideas that explain phenomena as diverse as why water freezes and how information can be sent around the world wirelessly; Life science core ideas that explore phenomena such as why children look similar but not identical to their parents and how human behaviour affects global ecosystems; Earth and space sciences core ideas focus on complex interactions in the Earth system and examine phenomena as varied as the big bang and global climate change; Engineering technology, and applications of science core ideas highlight engineering design and how it can contribute innovative solutions to society's problems. *Disciplinary Core Ideas* can make your science lessons more coherent and memorable, regardless of what subject matter you cover and what grade you teach. Think of it as a conceptual tool kit you can use to help your students learn important and useful science now, and continue learning throughout their lives.

The arrival of the Next Generation Science Standards (NGSS) makes it the ideal time to kick-start your professional development program, and this ambitious book is the perfect source of inspiration to help you do so. The book's emphasis is on developing highly effective teachers who are expected to improve student achievement in STEM education; its focus is on research-based models underlying systemic reform efforts across the nation. The book opens with expert views on the history of professional development in science education, the challenges of the new standards, and related research on learning. Then, the book's core

highlights critical aspects of several successful programs and provides forward-looking insights into the needed professional development surrounding the NGSS. Models and Approaches is a vital resource for state, district, and school leaders as well as classroom teachers. It will help you to both analyze what you do now and implement new strategies to make STEM professional development more effective at all levels.

The number one compliment we hear from teachers is that the lessons are complete and ready to take back to their classrooms and use. Emily Morgan and Karen Ansberry, coauthors of the Picture-Perfect Science Lessons series since the debut of the Picture-Perfect Science books and workshops more than 10 years ago, authors Emily Morgan and Karen Ansberry have learned one thing for certain: elementary school teachers are constantly clamoring for even more ways to engage children in reading and science through picture books! To meet that demand, the 15 all-new lessons in Even More Picture-Perfect Science Lessons bring you: even more convenience: You can cover reading and science content simultaneously and save time with ready-to-use student pages and assessments. Even more confidence in your own expertise: you get relevant science concepts and reading comprehension strategies to keep your teaching on track. Even more ways to entice even reading-phobic children: each lesson makes students yearn to learn science from such captivating fiction and nonfiction picture books as Houdini the Amazing Caterpillar; Captain Kidd's Crew Experiments With Sinking and Floating; and The Boy Who Harnessed the Wind. Plus: this latest volume even connects the lessons to A Framework for K 12 Science Education and the English Language Arts and Literacy Common Core State Standards. Just as teachers have been hoping, Even More Picture-Perfect Science Lessons delivers the whole package: teacher-friendly lessons, strong standards-based science content, and a kid-magnet formula that will get students engrossed in science while they improve their reading skills.

A fundamental, reader-friendly guide to evidence-based practice (EBP) for BSN, MSN, and DNP nursing students, Evidence-Based Practice in Nursing explains the conceptual underpinnings of EBP and demonstrates how nurses can put EBP concepts into practice. Replete with critical knowledge, skills, tools, and scholarly development to enable nurses to fully and confidently deliver the highest-quality EBP care, this book eschews a one-size-fits-all approach unique systematic guidelines for understanding and applying EBP. Building blocks of information grow progressively more complex to apply to any point along nursing's academic trajectory. Thoughtfully organized to fit a variety of EBP-related course objectives, Evidence Based Practice in Nursing easily adapts for standalone EBP courses at any level as well as advanced practice specialty courses that integrate EBP content. This book addresses the needs of all nursing instructors, including those who teach at multiple levels simultaneously. Key content discusses requisite conceptual knowledge of EBP for building clinical decision-making skills; conceptualizing, implementing, and evaluating EBP projects; conducting translational research and quality improvement for implementation and evaluation of EBP; developing leadership and structural empowerment strategies; and analyzing how students at each degree/level work with EBP independently, inter-professionally, and intraprofessionally. Chapters align with AACN essentials. Key Features: Follows a methodical systematic trajectory building from simple to complex concepts Includes abundant examples

demonstrating both negative and positive EBP applications Enables instructors to adopt one textbook for BSN, MSN, and DNP students Includes practical design templates for developing EBP information plans with critical guideposts Provides a quality improvement toolkit, key words and concepts, illustrative tables, and figures

"If you are interested in STEM education, policies, programs or practices, or you work on STEM in some capacity at any level, The case for STEM education will prove to be valuable reading. Author Rodger W. Bybee has written this book to inspire individuals in leadership roles to better understand and take action on STEM initiatives. The book's 10 chapters accomplish several tasks: Put STEM in context by outlining the challenges facing STEM education, drawing lessons from the Sputnik moment of the 1950s and 1960s, and contrasting contemporary STEM with other education reforms; Explore appropriate roles for the federal government, as well as states, districts, and individual schools; Offer several ideas and recommendations you can use to develop action plans for STEM. With an emphasis on both thinking and acting, The case for STEM education is a must-read for leaders at all levels: national and state policy makers, state-level educators responsible for STEM initiatives, college and university faculty who educate future STEM teachers, local administrators who make decisions about district and school programs, and teachers who represent STEM disciplines." - Back cover.

Praise for Effective Instruction for STEM Disciplines "The world of today's learners is a multimode, information-intensive universe of interactive bursts and virtual exchanges, yet our teaching methods retain the outdated characteristics of last generation's study-and-drill approach. New pedagogical methods, detailed and justified in this groundbreaking work, are essential to prepare students to confront the concerns of the future. The book challenges our traditional assumptions and informs the science, technology, engineering, and mathematics (STEM) community of the latest research on how the brain learns and retains information, how enhanced student engagement with subject material and its context is essential to deep learning, and how to use this knowledge to structure STEM education approaches that work."—David V. Kerns, Jr., Franklin and Mary Olin Distinguished Professor of Electrical and Computer Engineering, and founding provost, Olin College "Every STEM faculty member should have this book. It provides a handy introduction to the 'why and how' of engaging students in the learning process."—David Voltmer, professor emeritus, Rose-Hulman Institute of Technology, and American Society for Engineering Education Fellow "The poor quality of math and science education and the shortage of well-qualified graduates are acknowledged almost daily in the U.S. press. Here the authors provide much-needed insights for educators seeking to improve the quality of STEM education as well as to better prepare students to solve the problems they will confront in our increasingly technology-driven world."—Keith Buffinton, interim dean of engineering, Bucknell University

STEM Labs for Middle Grades offers activities that challenge students to apply scientific inquiry, content knowledge, and technological design to solve real-world problems. An excellent addition to your curriculum, this supplement will help cultivate students' interest in science, technology, engineering, and math. --Mark Twain Media Publishing Company specializes in providing engaging supplemental books and decorative resources to complement middle- and upper-grade classrooms. Designed

by leading educators, this product line covers a range of subjects including math, science, language arts, social studies, history, government, fine arts, and character.

Doing Science, second edition, offers a rare compendium of practical advice based on how working scientists pursue their craft. It covers each stage of research, from formulating questions and gathering data to developing experiments and analyzing results and finally to the many ways for presenting results. Drawing on his extensive experience both as a researcher and a research mentor, Ivan Valiela has written a lively and concise survey of everything a beginning scientist needs to know to succeed in the field. He includes chapters on scientific data, statistical methods, and experimental designs, and much of the book is devoted to presenting final results. Now in its second edition, Doing Science has been completely updated and expanded to include a brand-new chapter on doing science in society, as well as increased coverage of the ethics of avoiding conflict of interest. Anyone beginning a scientific career, or who advises students in research will find Doing Science, second edition, an invaluable source of advice.

How do you create effective STEM classrooms that energize students, help them grow into creative thinkers and collaborators, and prepare them for their futures? This practical book from expert Anne Jolly has all the answers and tools you need to get started or enhance your current program. Based on the author's popular MiddleWeb blog of the same name, STEM by Design reveals the secrets to successful lessons in which students use science, math, and technology to solve real-world engineering design problems. You'll learn how to: Select and adapt quality existing STEM lessons that present authentic problems, allow for creative approaches, and engage students in meaningful teamwork; Create your own student-centered STEM lessons based on the Engineering Design Process; Assess students' understanding of basic STEM concepts, their problem-solving abilities, and their level of engagement with the material; Teach STEM in after-school programs to further build on concepts covered in class; Empower girls to aspire to careers in STEM and break down the barriers of gender bias; Tap into STEM's project-based learning style to attract and engage all students. Throughout this user-friendly book, you'll find design tools such as checklists, activities, and assessments to aid you in developing or adapting STEM lessons. These tools, as well as additional teacher resources, are also available as free downloads from the book's website, <http://www.stem-by-design.com>.

Bring STEM to life for students with zombies, rockets, celebrities, and more STEM to Story: Enthralling and Effective Lesson Plans for Grades 5-8 inspires learning through fun, engaging, and meaningful lesson plans that fuse hands-on discovery in science, technology, engineering, and math (STEM) with creative writing. The workshop activities within the book are the innovative result of a partnership between 826 National's proven creative writing model and Time Warner Cable's Connect a Million Minds, an initiative dedicated to connecting young people to the wonders of STEM through hands-on learning. Authentically aligned with both the Common Core State Standards and the Next Generation Science Standards, this book provides teachers, after-school and out-of-school providers, and parents with field-tested lessons, workshops, and projects designed by professionals in each field. Including reflective observations by arts and science celebrities like Jon Scieszka, Mayim Bialik, and Steve Hockensmith, lessons

feature bonus activities, fun facts, and teaching points for instructors at every level. These quirky, exploratory lessons will effectively awaken student imaginations and passions for both STEM and creative writing, encourage identity with scientific endeavors, and make both science and writing fun. Grades five through eight is the critical period for engaging students in STEM, and this book is designed specifically to appeal to – and engage – this age group. The guided curricula fosters hands-on discovery, deep learning, and rich inquiry skills while feeling more like play than school, and has proven popular and effective with both students and teachers. Awaken student imagination and get them excited about STEM Fuse creative writing with STEM using hands-on activities Make scientific principles relevant to students' lives Inspire students to explore STEM topics further The demand for STEM workers is closely linked to global competitiveness, and a successful future in STEM depends upon an early introduction to the scientific mindset. The challenge for teachers is to break through students' preconceptions of STEM fields as "hard" or "boring," to show them that STEM is everywhere, it's relevant, and it's loads of fun. For proven lesson plans with just a dash of weird, STEM to Story is a dynamic resource, adaptable and applicable in school, after school, and at home.

After conducting research at a rigorous medical school, your students arrive for their first day of hospital duty only to be confronted with four sick patients, each with a different mystery ailment. How can your teams of student-physicians come up with the correct diagnoses? This attention-grabbing narrative and the corresponding role-plays are the basis of *Diagnosis for Classroom Success: Making Anatomy and Physiology Come Alive*. This high school curriculum gets your students deeply involved in inquiry-based science as it acquaints them with major body systems, sickle cell anaemia, HIV, pregnancy, and diabetes. This Teacher Edition (which includes the Student Edition) spells out the book's relevance to the Framework for K-12 Science Education and provides rubrics, answer keys, and prep tips to use before, during, and after the lessons. By blending the power of story with engaging investigations, *Diagnosis for Classroom Success* will cure what ails your lecture-weary biology classes.

This is a must-have book if you're going to tackle the challenging concepts of force and motion in your classroom. --

"STEM Lesson Essentials moves beyond the rhetoric and provides knowledge, tools, models, and examples that make STEM a reality of teaching and learning in classrooms." -Rodger Bybee, Executive Director (Retired), Biological Sciences Curriculum Study

Want to know how to implement authentic STEM teaching and learning into your classroom? *STEM Lesson Essentials* provides all the tools and strategies you'll need to design integrated, interdisciplinary STEM lessons and units that are relevant and exciting to your students. With clear definitions of both STEM and STEM literacy, the authors argue that STEM in itself is not a curriculum, but rather a way of organizing and delivering instruction by weaving the four disciplines together in intentional ways. Rather than adding two new subjects to the curriculum, the engineering and technology practices can instead be blended into existing math and science lessons in ways that engage students and help them master 21st century skills. *STEM Lesson Essentials* shows teachers how to begin the STEM integration journey with: five guiding principles for effective STEM instruction classroom examples of what these principles look like

in action sample activities that put all four STEM fields into practice lesson planning templates for STEM units. Explicit connections are made among the STEM practices, including the Common Core Standards for Mathematical Practice and the Framework for K-12 Science Education, helping you easily recognize ways in which STEM lessons can engage students in multiple standards at the same time. With ideas that are practical and achievable in any classroom, STEM Lesson Essentials will give you the confidence and knowledge to weave engineering and technology concepts into your math and science curriculum. STEM teaching doesn't have to be hard. You just have to get started. Try it out with STEM Lesson Essentials, and watch student understanding, achievement, and motivation soar. Save with bundles! Purchase 15 copies and get 15% off with a Book Study Bundle.

"This book not only describes how argument-driven inquiry (ADI) works and why it is important, but also provides 14 investigations that can be used in the classroom to help students reach the performance expectations found in the Next Generation Science Standards (NGSS Lead States 2013; henceforth referred to as the NGSS) for 3rd grade . The fourteen investigations described in this book will also enable students to develop the disciplinary-based literacy skills outlined in the Common Core State Standards for English language arts (NGAC and CCSSO 2010) because ADI gives students an opportunity to give presentations to their peers, respond to audience questions and critiques, and then write, evaluate, and revise reports as part of each investigation. In addition, these investigations will help students learn many of the mathematical ideas and practices outlined in the Common Core State Standards for mathematics (NGAC and CCSSO 2010) because ADI gives students an opportunity to use mathematics to collect, analyze, and interpret data. Finally, and perhaps most importantly, ADI can help emerging bilingual students meet the English Language Proficiency Standards (CCSSO 2010 2014) because it provides a language-rich context where children can use receptive and productive language to communicate and to negotiate meaning with others. Teachers can therefore use these investigations to align how and what they teach with current recommendations for improving science education"--
" ... Provides essential guidance for everyone from teachers to school administrators to district and state science coordinators. As practical as it is timely, this book includes an introduction to the NGSS ; examples of the standards translated to classroom instruction in elementary, middle, and high school ; and assistance in adapting current units of instruction to align with the standards"--Page 4 of cover.

Using a common format for teaching inquiry-based science, offers fifteen lessons for students in grades K-4 that use picture books to increase understanding of scientific subjects.

"Picture your students designing a hearing aid for the main character in *EI Deafo*-and then disguising it as a fashion accessory. Or imagine them helping the shipwrecked Swiss Family Robinson build a structure to keep them cool under

the hot sun. Novel Engineering shows how your students can use anything from a picture book to a novel to a historical text as the basis for an engineering design challenge. This innovative resource will have your students pulling information from literature to identify a problem. Then, using details from the story, they'll apply the engineering design process to develop functional solutions for their "clients"-the book's characters. Novel Engineering provides you with plenty of practical guidance for integrating engineering and English language arts (ELA), including a thorough introduction to the concept and detailed implementation advice. But the book comes to life through five in-depth case studies featuring the use of novels, a biography, and a nonfiction historical text. In addition to demonstrating Novel Engineering projects in the classroom, the case studies let you practice thinking about what your own students' work could look like and how you would respond. You'll see that this approach doesn't require books outside your existing ELA or social studies curriculum or a specific building-materials kit. You'll also see that Novel Engineering can help you engage students in a powerful new way. As the authors write, "We have been encouraged by the excitement that students and teachers have shown for their work during Novel Engineering units. ... Students have taken ownership of their learning and are able to navigate the steps of the engineering design process, creating functional solutions to problems they have identified in texts."--

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