

## Science Research Paper Rubric High School

This book by Sheryn Spencer Waterman follows the bestselling Handbook on Differentiated Instruction for Middle and High Schools. With numerous examples and strategies, it is an all-inclusive manual on assessing student readiness, interests, learning and thinking styles. It includes examples of Pre-, Formative and Summative assessments Informal and formal assessments Oral and written assessments Project and performance assessments Highly structured and enrichment assessments for struggling to gifted students Assessment tools and rubrics

Building on the foundation set in Volume I—a landmark synthesis of research in the field—Volume II is a comprehensive, state-of-the-art new volume highlighting new and emerging research perspectives. The contributors, all experts in their research areas, represent the international and gender diversity in the science education research community. The volume is organized around six themes: theory and methods of science education research; science learning; culture, gender, and society and science learning; science teaching; curriculum and assessment in science; science teacher education. Each chapter presents an integrative review of the research on the topic it addresses—pulling together the existing research, working to understand the historical trends and patterns in that body of scholarship, describing how the issue is conceptualized within the literature, how methods and theories have shaped the outcomes of the research, and where the strengths, weaknesses, and gaps are in the literature. Providing guidance to science education faculty and graduate students and leading to new insights and directions for future research, the Handbook of Research on Science Education, Volume II is an essential resource for the entire science education community.

The purpose of this study was to identify and describe the associations between systemic equity pedagogy (SEP) practices in highly diverse high schools and their students' science achievement and college readiness. This study focuses on science programs in ten highly diverse Texas high schools serving students who exhibit high science achievement and college readiness. According to the Policy Research Group in Science Education, only two percent of all culturally diverse high schools within the state of Texas demonstrate high science achievement and college readiness on state-tracked school-level indicators.

Transforming a school context where achievement disparities exist among student groups in science classrooms necessitates that public school officials understand key factors, or "drivers," and associated indicators contributing to SEP in programs. A model for programs is suggested using a framework for SEP based on data collected from ten highly successful, high diversity high schools. The following research questions address the research gap regarding indicators of SEP associated with high science achievement and college readiness in highly culturally diverse high schools. How do data from ten highly successful, high diversity high schools inform the development of a comprehensive SEP rubric? How do high achieving high schools of culturally diverse student populations score on a comprehensive SEP rubric? How do teachers' perceptions toward implementing SEP practices vary in different schools? Three research papers detail the research of this dissertation. The purpose for the first paper is to increase understanding of indicators facilitating systemic and equitable teaching and learning practices, otherwise referred to as systemic

equity pedagogy (SEP). Results of the study show indicators of a comprehensive SEP rubric. Together, 127 indicators, thirty categories, and eight SEP drivers form a model framing equitable teaching and learning practices associated with high science achievement and college readiness. In conclusion, indicators within the SEP rubric can be described as action-oriented descriptors that science teachers engage formally or informally in order to facilitate quality science education for all students. The purpose for paper two is to score equitable teaching and learning practices in highly successful high school science programs based on the SEP rubric. Findings reveals that implementation of various equitable teaching and learning practices vary across science programs and these practices can be described as both pedagogical and non-pedagogical. In conclusion, varying degrees of implementation exist for indicators in the SEP rubric. In paper three, the purpose is to understand science teachers' attitude and approach toward implementing systemic teaching and learning practices. Results from this study provide scores that indicate science teachers' perceptions of their approach to SEP. This study concludes by suggesting high achieving science programs may operate within a continuum for implementing equitable teaching and learning practices. The electronic version of this dissertation is accessible from <http://hdl.handle.net/1969.1/151086>

Help students write about science content and build their scientific thinking skills! This 2nd edition resource was created to support College and Career Readiness Standards, and provides an in-depth research base about content-area literacy instruction, including key strategies to help students write about and comprehend scientific content. Each strategy includes classroom examples by grade ranges (1-2, 3-5, 6-8 and 9-12) and necessary support materials, such as graphic organizers, templates, or digital resources to help teachers implement quickly and easily. Specific suggestions for differentiating instruction are also provided to help English language learners, gifted students, and students reading below grade level.

This widely adopted textbook provides the essential content and skill-building tools for teaching the responsible conduct of scientific research. Scientific Integrity covers the breadth of concerns faced by scientists: protection of animal and human experimental subjects, scientific publication, intellectual property, conflict of interest, collaboration, record keeping, mentoring, and the social and ethical responsibilities of scientists. Learning activities and resources designed to elucidate the principles of Scientific Integrity include Dozens of highly relevant, interactive case studies for discussion in class or online Numerous print and online resources covering the newest research guidelines, regulations, mandates and policies Discussion questions, role-playing exercises, and survey tools to promote critical thought Documents including published rules of conduct, sample experimentation protocols, and patent applications The new edition of Scientific Integrity responds to significant recent changes—new mandates, policies, laws, and other developments—in the field of responsible conduct of research. Dr. Macrina plants the seeds of awareness of existing, changing, and emerging standards in scientific conduct and provides the tools to promote critical thinking in the use of that information. Scientific Integrity is the original turnkey text to guide the next generations of scientists as well as practicing researchers in the essential skills and approaches for the responsible conduct of science.

This book presents innovations in teaching and learning science, novel approaches to science curriculum, cultural and contextual

factors in promoting science education and improving the standard and achievement of students in East Asian countries. The authors in this book discuss education reform and science curriculum changes and promotion of science and STEM education, parental roles and involvement in children's education, teacher preparation and professional development and research in science education in the context of international benchmarking tests to measure the knowledge of mathematics and science such as the Trends in Mathematics and Science Study (TIMSS) and achievement in science, mathematics and reading like Programme for International Student Assessment (PISA). Among the high achieving countries, the performance of the students in East Asian countries such as Singapore, Taiwan, Korea, Japan, Hong Kong and China (Shanghai) are notable. This book investigates the reasons why students from East Asian countries consistently claim the top places in each and every cycle of those study. It brings together prominent science educators and researchers from East Asia to share their experience and findings, reflection and vision on emerging trends, pedagogical innovations and research-informed practices in science education in the region. It provides insights into effective educational strategies and development of science education to international readers.

Rubrics for Assessing Student Achievement in Science Grades K-12 Corwin Press

"Rubrics for Assessing Student Achievement in Science, Grades K-12 is a valuable resource that will help measure what students know and are able to do in the science classroom. It will yield more consistent and defensible judgements, more precise feedback, and sharper student learning and performance"--Back cover.

Offers strategies and lesson plans for school librarians assisting high school students with research skills, including topic development, note taking, sorting notes, rough drafts, rewriting, and presentation.

Are you interested in using argument-driven inquiry for high school lab instruction but just aren't sure how to do it? You aren't alone. This book will provide you with both the information and instructional materials you need to start using this method right away. Argument-Driven Inquiry in Biology is a one-stop source of expertise, advice, and investigations. The book is broken into two basic parts: 1. An introduction to the stages of argument-driven inquiry—from question identification, data analysis, and argument development and evaluation to double-blind peer review and report revision. 2. A well-organized series of 27 field-tested labs that cover molecules and organisms, ecosystems, heredity, and biological evolution. The investigations are designed to be more authentic scientific experiences than traditional laboratory activities. They give your students an opportunity to design their own methods, develop models, collect and analyze data, generate arguments, and critique claims and evidence. Because the authors are veteran teachers, they designed Argument-Driven Inquiry in Biology to be easy to use and aligned with today's standards. The labs include reproducible student pages and teacher notes. The investigations will help your students learn the core ideas, crosscutting concepts, and scientific practices found in the Next Generation Science Standards. In addition, they offer ways for students to develop the disciplinary skills outlined in the Common Core State Standards. Many of today's teachers—like you—want to find new ways to engage students in scientific practices and help students learn more from lab activities. Argument-Driven Inquiry in Biology does all of this even as it gives students the chance to practice reading, writing, speaking, and using math in the context of science.

This comprehensive resource for STEM teachers and students, outlines the various stages of large-scale research projects, enabling

teachers to coach their students through the research process. This handbook provides enough detail to embolden all teachersOCoeven those who have never designed an experiment on their ownOCoto support student-researchers through the entire process of conducting experiments."

This book features case studies and active learning exercises related to using evidence-based approaches in several types of academic libraries. Evidence-Based Librarianship is a vital reference to practicing librarians, library science students, and library science educators as it focuses on applying practice-based evidence gleaned from users, direct observation, and research. Peer-reviewed case studies from leading academic librarians Active learning exercises for on-the-job training and library science education related to evidence-based practice Detailed bibliography

The focus of this Handbook is on North American (Canada, US) science education and the scholarship that most closely supports this program. The reviews of the research situate what has been accomplished within a given field in North American rather than international context.

With a focus on providing concrete teaching strategies for scholars, the Handbook on Teaching and Learning in Political Science and International Relations blends both theory and practice in an accessible and clear manner. In an effort to help faculty

In many schools and higher education institutions it has become common practice to share assessment criteria with students. Sometimes it is required for accountability purposes, at other times criteria are used as a means to communicate expectations to students. However, the idea that explicit assessment criteria should be shared with students has been contested. On the one hand, research has shown that explicit criteria may positively affect student performance, reduce their anxiety, as well as support students' use of self-regulated learning strategies. On the other hand, there are fears that explicit criteria may have a restraining influence on students' learning, as well as limiting their autonomy and creativity. There are also indications of students becoming more performance oriented, as opposed to learning oriented, when being provided with explicit assessment criteria. Taken together, it is not fully understood under which circumstances it is productive for student learning to share explicit assessment criteria, and under which circumstances it is not. In particular, empirical research on the proposed negative effects of sharing criteria with learners is limited and most fears voiced in the literature are based on individual experiences and anecdotal evidence. In this book, we therefore bring different perspectives on transparency in assessment together, in order to further our understanding of how students are influenced by the use of explicit assessment criteria. A deeper understanding of the influence of explicit assessment criteria on students' understanding of criteria, motivation, and learning is equally imperative for future research and educational practice, both of which need to go beyond individual opinions and convictions.

Every teacher knows the challenge of trying to engage reluctant readers and struggling writers—students whose typical response to a writing prompt is a few sentence fragments scribbled on a sheet of paper followed by an elaborate shrug of the shoulders. The best way to engage less confident readers and writers is to give them something powerful to think about. The Discourse and Writing Cycle explores writing as a means to focus student thinking, fuel deeper learning, and build complex understanding in English, social studies, math, and science. This field-tested approach from well-respected experts Eleanor Dougherty, Laura Billings, and Terry Roberts is designed for use in grades 4–12. The book explores the three interrelated sequences of the cycle—the Discourse Sequence, the Transition to Writing Sequence, and the Writing Sequence—and includes classroom examples and sample lesson plans from across the content areas. The cycle will inspire you as a teacher and help you to inspire your students to write with confidence and competence. "How often we dim or extinguish the creative sparks

that can come from good writing! William Butler Yeats proclaimed that 'Education is not the filling of a pail, but the lighting of a fire.' This book lights the fire for the teaching of writing." —John Hattie, author of the Visible Learning books

An accessible and authoritative approach to effective science teaching, this text is the work of 16 contributors who each employ a single metaphor that will resonate with readers --that science education can and should be considered an exciting game. With "Windows Into the Classroom" personal accounts and "The Game in Action" vignettes students are provided with practical applications throughout the book. Many contributors to this book were involved in the development and draft review of the National Science Education Standards, and therefore fully appreciate the importance of overtly linking research-based commentary and recommendations to the Standards. As a result, the entire work is steeped in a current research foundation tied closely to the National Science Education Standards. Features of this new text: "Windows into the classroom" personal accounts and "The Game in Action" vignettes provide practical applications throughout the book. Written in accessible first person accounts, each contributor takes a conversational approach that will appeal to a broad audience of readers. Introductions establishes the game metaphor that sustains the chapter and weaves throughout the book. Conclusions leaves the reader with upbeat and practical suggestions for effective science teaching. Author Biographies highlight the distinguished record of achievement of each contributor. Additional Resources at the end of each chapter provide suggestions of useful readings, websites, and other instructional instruments. Reflection questions intended to provoke the reader to apply the ideas and concepts unearthed in the chapter to his or her own unique vantage or condition as an educator. "The research base of this proposal is a 10 on a scale of 1-10 ...I'm impressed with the style and theme of the essays ...my students would learn a great deal regarding the practical application of science education." Professor David R. Wetzel, "Bloomsburg University" "I very much like the use of the analogy of a "Game" used by the authors. 'The text is VERY readable.'" Professor Molly Weinburgh "Georgia State University" "The writing style and use of the game metaphor will undoubtedly grab undergraduate, alternate entry, and graduate student interest." Professor Warren J. DiBiase, EdD "University of North Carolina, Charlotte" Author Bio A decorated veteran of high school science teaching, Jeff now researches effective science teaching and learning, testing innovations on his students at Northern Iowa. He also develops curriculum, consults at local and national levels, and serves science education organizations. He has published research and philosophy in Educational Leadership, Phi Delta Kappa, The Science Teacher, The American Biology Teacher, Education Week, the Journal of College Science Teaching, the Journal of Science Teacher Education, the International Journal of Science Education, and Teacher magazine. Page 1 of 2

The rising cost of tuition, increasing competition, and mounting student loan debt has caused educational leaders to rethink degree programs and resources for learners. As such, open educational resources, prior learning assessment, open degree plans, and competency-based learning have gained popularity in the field of higher education. Enhancing Education Through Open Degree Programs and Prior Learning Assessment is a critical scholarly resource that examines teaching and learning materials that learners may freely use and reuse without charge. Featuring coverage on a broad range of topics such as open educational

resources, prior learning assessment, and competency-based learning, this book is geared towards educators, professionals, school administrators, researchers, academicians, librarians, and students seeking current research on equity and access to higher education for all learners across the globe.

This book takes a developmental perspective at the use of scoring rubrics to assess student work. Citing developmental characteristics of each age, the author presents examples and adaptations of assessment rubrics on a variety of subjects for teachers from kindergarten through adult/college. After a presentation of foundation information on rubrics, separate chapters are devoted to each grade level from primary through adult. Written so that each chapter can be addressed independently, the book provides additional chapters devoted to assessing technological topics and using rubrics with students with special needs. The final chapters provide practical information to help teachers to create their own rubrics and to convert rubric scores to letter grades. An updated annotated listing of recommended rubric websites is included.

Every teacher seeks to be an effective teacher. Every teacher wants to have a positive, remarkable, and lasting influence on students' lives. But what makes for an effective teacher? What role does teacher preparation play in teacher effectiveness? What do effective teachers do during planning, instruction, and assessment? How do they create a learning environment that engages and supports students? And how do effective teachers interact with their students to promote the best opportunities and results for all? In *Qualities of Effective Teachers*, 3rd edition, James H. Stronge explores these questions and more as he synthesizes the literature on teacher effectiveness. The result? A research-based framework for effective teaching that addresses: Professional knowledge Instructional planning Instructional delivery Assessment Learning environment Professionalism Stronge also examines characteristics of effective teachers of at-risk students and high-ability students. To bridge the gap between research and practice, he includes checklists of skills and positive qualities associated with effective teacher performance as well as red flags that indicate that teachers may not be reaching their full potential in the classroom. This resource is for any educator interested in improving teaching. It offers research-based advice for teachers who wish to improve their own performance, as well guidance for teacher leaders and supervisors, school administrators and department heads, staff development specialists, teacher and administrator educators, human resource specialists, and education policymakers and their staffs. Anyone who has a vested interest in students and their success can gain valuable insight and practical tools to ensure positive outcomes for all students. New to the 3rd edition: Introduction of the Framework for Effective Teaching and its six domains—professional knowledge; instructional planning; instructional delivery; assessment; learning environment; professionalism Chapter vignettes updated to illustrate the domains of the Framework for Effective Teaching Updated reference charts at the end of chapters, keyed to the subdomains of the Framework for Effective Teaching and expanded to include references for 21 century teachers Twenty-nine sidebars interspersed throughout chapters that provide state-of-the-art supplementary text on effective teaching practices and research findings Updated Teacher Skills Assessment Checklist, keyed to the domains of the Framework for Effective Teaching Updated Part 2 presents positive qualities and red flags associated with effective teachers, keyed to the domains of the

Framework for Effective Teaching More than 1,000 entries in the References

Provides information for teachers on how to integrate technology into their lessons.

Learning progressions – descriptions of increasingly sophisticated ways of thinking about or understanding a topic (National Research Council, 2007) – represent a promising framework for developing organized curricula and meaningful assessments in science. In addition, well-grounded learning progressions may allow for coherence between cognitive models of how understanding develops in a given domain, classroom instruction, professional development, and classroom and large-scale assessments. Because of the promise that learning progressions hold for bringing organization and structure to often disconnected views of how to teach and assess science, they are rapidly gaining popularity in the science education community. However, there are significant challenges faced by all engaged in this work. In June 2009, science education researchers and practitioners, as well as scientists, psychometricians, and assessment specialists convened to discuss these challenges as part of the Learning Progressions in Science (LeaPS) conference. The LeaPS conference provided a structured forum for considering design decisions entailed in four aspects of work on learning progressions: defining learning progressions; developing assessments to elicit student responses relative to learning progressions; modeling and interpreting student performance with respect to a learning progression; and using learning progressions to influence standards, curricula, and teacher education. This book presents specific examples of learning progression work and syntheses of ideas from these examples and discussions at the LeaPS conference.

An essential resource for teachers and librarians who work with students in the later high school years through college and graduate school levels, this book explains and simplifies the scholarly task of researching and writing a scientific literature review.

- Teaches the Information Search Process (ISP) of Carol Kuhlthau through carefully designed workshops that guide students through the inquiry process
- Encourages inquiry into science-based subjects by directing students towards a topic of personal interest linked to those studied in their science class
- Aligns instruction on researching and writing a scientific literature review with the Common Core State Standards
- Covers use of databases, general press articles, peer-reviewed studies, white papers, and creating tables, charts, and graphs

This new edition retains the appeal, clarity and practicality that made the first so successful, and continues to provide a fundamental introduction to the principles and purposes of rubrics, with guidance on how to construct them, use them to align course content to learning outcomes, and apply them in a wide variety of courses, and to all forms of assignment. Reflecting developments since publication of the first edition, the authors have extended coverage to include: \* Expanded discussion on use of rubrics for grading \* Grading on-line with rubrics \* Wider coverage of rubric types (e.g., holistic, rating scales) \* Rubric construction in student affairs \* Pros and cons of working with "ready-made" rubrics \* Using rubrics to improve your teaching, and for SoTL \* Use of rubrics in program assessment (case study) \* Application of rubrics in the arts, for study abroad, service learning and students' independent learning \* Up-dated literature review

This second edition enhances the "five big ideas" for raising reading achievement with seven cognitive strategies and more than twenty "teaching for learning" tips for daily instruction.

Create assessments that meet state standards and target students' learning needs! In this revised edition of her bestseller, Kay Burke provides a wide range of easy-to-implement alternative assessments that address today's accountability requirements.

Designed for use across all content areas, these formative assessments are rooted in the language of state standards and emphasize differentiating instruction to meet students' diverse learning needs. Updated research and examples help K–12 teachers: Build Response to Intervention checklists for struggling students Develop unit plans using differentiated learning and assessment strategies Create portfolios that emphasize metacognition Design performance tasks that motivate and engage students Construct rubrics that describe indicators of quality work Create tests that focus on higher-order thinking skills

In today's climate of accountability and standards, increasing attention is focused on teacher "quality," with less emphasis on what teachers actually do to interest and engage students in learning. This path-breaking volume addresses this research problem with a clear definition and a content-specific analysis of the most essential teaching moment—the instructional explanation—for vital new perspectives on educational method and process. Rich in examples from science, mathematics, and the humanities, *Instructional Explanations in the Disciplines* explores a variety of interactive contexts for teaching and learning, which may be collaborative between teachers, students, and others, performed in non-classroom settings, or assisted by technology. The book's subject-matter-specific framework reveals key elements in the process, such as carefully examining the question to be answered, making connections with what is already known, and developing examples conducive to further understanding. *Instructional Explanations in the Disciplines* is a valuable addition to the education library, giving researchers new methods of unpacking educational process as few books before it.

The second edition of *Effective Grading*—the book that has become a classic in the field—provides a proven hands-on guide for evaluating student work and offers an in-depth examination of the link between teaching and grading. Authors Barbara E. Walvoord and Virginia Johnson Anderson explain that grades are not isolated artifacts but part of a process that, when integrated with course objectives, provides rich information about student learning, as well as being a tool for learning itself. The authors show how the grading process can be used for broader assessment objectives, such as curriculum and institutional assessment. This thoroughly revised and updated edition includes a wealth of new material including: Expanded integration of the use of technology and online teaching A sample syllabus with goals, outcomes, and criteria for student work New developments in assessment for grant-funded projects Additional information on grading group work, portfolios, and service-learning experiences New strategies for aligning tests and assignments with learning goals Current thought on assessment in departments and general education, using classroom work for program assessments, and using assessment data systematically to "close the loop" Material on using the best of classroom assessment to foster institutional assessment New case examples from colleges and universities, including community colleges "When the first edition of *Effective Grading* came out, it quickly became the go-to book on evaluating

student learning. This second edition, especially with its extension into evaluating the learning goals of departments and general education programs, will make it even more valuable for everyone working to improve teaching and learning in higher education."

—L. Dee Fink, author, *Creating Significant Learning Experiences* "Informed by encounters with hundreds of faculty in their workshops, these two accomplished teachers, assessors, and faculty developers have created another essential text. Current faculty, as well as graduate students who aspire to teach in college, will carry this edition in a briefcase for quick reference to scores of examples of classroom teaching and assessment techniques and ways to use students' classroom work in demonstrating departmental and institutional effectiveness." —Trudy W. Banta, author, *Designing Effective Assessment* Provides step-by-step instructions on creating a writing program using rubrics, and includes lesson plans, forms, and scheduling guidelines.

What are scientific inquiry practices like today? How should schools approach inquiry in science education? *Teaching Science Inquiry* presents the scholarly papers and practical conversations that emerged from the exchanges at a two-day conference of distinctive North American 'science studies' and 'learning science'scholars.

Developed for grades 6-12, this rich resource provides teachers with practical strategies to enhance science instruction. Strategies and model lessons are provided in each of the following overarching topics: inquiry and exploration, critical thinking and questioning, real-world applications, integrating the content areas and technology, and assessment. Research-based information and management techniques are also provided to support teachers as they implement the strategies within this resource. This resource supports core concepts of STEM instruction.

"MsoNormal" Anthem *Guide to Critical Thinking Skills: Language and Logic* guides readers in the process of critical thinking and persuasive speaking and writing. The text discusses informal thinking, the formal processes of induction, deduction, and syllogistic reasoning, in a clear format that makes it easy for the "beginning logician" to process. Students learn how to form a proposition, identify issues, gather evidence, and process an argument. To get started, logic games, puzzles, and real life examples ask students to consider how we evaluate, analyze, and decide. What happens if Janie says, 'Mom, can I go to the party? All of my friends are going!' And Mom responds, 'What if all of your friends jumped off the empire State building?' Is 'all of my friends are going' a good reason? Does mom have a point? *Language and Logic* will help students evaluate these everyday decisions. Then a more formal look at induction and deduction challenges students to practice higher-level thinking skills, such as using analogies for evaluation, and working through syllogisms to process ideas. After a review of the Greek Fallacies, readers can have some literary logic fun by analyzing old standards like 'Love is a Fallacy' and the persuasive love poem 'The Passionate Shepherd'"-- Provided by publisher.

This inaugural handbook documents the distinctive research field that utilizes history and philosophy in investigation of theoretical, curricular and pedagogical issues in the teaching of science and mathematics. It is contributed to by 130 researchers from 30 countries; it provides a logically structured, fully referenced guide to the ways in which science and mathematics education is,

informed by the history and philosophy of these disciplines, as well as by the philosophy of education more generally. The first handbook to cover the field, it lays down a much-needed marker of progress to date and provides a platform for informed and coherent future analysis and research of the subject. The publication comes at a time of heightened worldwide concern over the standard of science and mathematics education, attended by fierce debate over how best to reform curricula and enliven student engagement in the subjects. There is a growing recognition among educators and policy makers that the learning of science must dovetail with learning about science; this handbook is uniquely positioned as a locus for the discussion. The handbook features sections on pedagogical, theoretical, national, and biographical research, setting the literature of each tradition in its historical context. It reminds readers at a crucial juncture that there has been a long and rich tradition of historical and philosophical engagements with science and mathematics teaching, and that lessons can be learnt from these engagements for the resolution of current theoretical, curricular and pedagogical questions that face teachers and administrators. Science educators will be grateful for this unique, encyclopaedic handbook, Gerald Holton, Physics Department, Harvard University This handbook gathers the fruits of over thirty years' research by a growing international and cosmopolitan community Fabio Bevilacqua, Physics Department, University of Pavia

The Value of Science Projects Science projects are an especially effective way of teaching students about the world around them. Whether conducted in the classroom or for a science fair, science projects can help develop critical thinking and problem solving skills. In a classroom setting, science projects offer a way for teachers to put "action" into the lessons. The students have fun while they're learning important knowledge and skills. And the teacher often learns with the students, experiencing excitement with each new discovery. Science projects are generally of two types: non-experimental and experimental. Non-experimental projects usually reflect what the student has read or heard about in an area of science. By creating displays or collections of scientific information or demonstrating certain natural phenomena, the student goes through a process similar to a library research report or a meta-analysis in any other subject. Projects of this type may be appropriate for some students at a very early level, but they usually do not provide the experiences that develop problem-solving skills related to the scientific process. On the other hand, experimental projects pose a question, or hypothesis, which is then answered by doing an experiment or by modeling a phenomenon. The question doesn't have to be something never before answered by scientist—that is not necessary to conduct original research. The process of picking a topic, designing an experiment, and recording and analyzing data is what's important. The authors persuasively argue that the present cascade of reforms to public education is a consequence of a larger intention to shrink government. The startling result is that more of public education's assets and resources are moving to the private sector and to the prison industrial complex. Drawing on various forms of evidence-structural, economic, narrative, and youth-generated participatory research-the authors reveal new structures and circuits of dispossession and privilege that amount to a clear failure of present policy. Policymaking is at war with the interests of the vast majority of citizens, and especially with urban youth of color. In the final chapter the authors explore democratic principles and offer examples essential to mobilizing, in solidarity with educators,

