Invent To Learn Making Tinkering And Engineering In The Classroom Sylvia Libow Martinez

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Making Science - Christa Flores 2016-11-11
Making Science: Reimagining STEM Education in Middle School and Beyond is a guide to help educators use new technology and a designer mindset to create personalized learning experiences that engage students in the wonder of science. This is an inclusive STEM curriculum that empowers students to become informed citizens and global problem-solvers.

Makerspaces in School - Lacy Brejcha 2021-09-09
Organized into an easy-to-follow, month-by-month plan for implementation, this book provides field-tested and research-based knowledge that will serve educators as they create and maintain a meaningful Makerspace. Although science, technology, engineering, arts, and math have made huge gains in the past decade, STEAM jobs are not being filled at the rate they are being created or needed. Makerspaces in School promotes innovative thinking in students that fills this need. Through Makerspaces, project-based learning provides opportunities for credible, legitimate, and authentic growth and development. This book will allow any educator to walk away with a plan to create a Makerspace in his or her classroom or a school- or districtwide model that works for many. Makerspaces are very fluid places—each is unique in its own way! 2020 Teachers' Choice Award for Professional Development Winner

The Inner Principal - David Loader 2002-11
This is an account of how a principal combines the rational and emotional components of leadership to lead the transformation of a school. Most attempts at reform come from the outside, with people wishing to impose a curriculum and benchmarks; this book assumes that schools can transform themselves, but only when those involved in schools (especially principals) develop self-respect and achieve self-actualization. The author believes, and has demonstrated in his colleges, that a sensitive, thoughtful, proactive leadership might yet deliver the quality outcomes that the community desires from schooling.

Make Space - Scott Doorley 2012-01-03
"If you are determined to encourage creativity and provide a collaborative environment that will bring out the best in people, you will want this book by your side at all times." —Bill Moggridge, Director of the Smithsonian's Cooper-Hewitt National Design Museum "Make Space is an articulate account about the importance of space; how we think about it, build it and thrive in it." —James P. Hackett, President and CEO, Steelcase An inspiring guidebook filled with ways to alter space to fuel creative work and foster collaboration. Based on the work at the Stanford University d.school and its Environments Collaborative Initiative, Make Space is a tool that shows how space can be intentionally manipulated to ignite creativity. Appropriate for designers charged with creating new spaces or anyone interested in revamping an existing space, this guide offers novel and non-obvious strategies for changing surroundings specifically to enhance the ways in which teams and individuals communicate, work, play--and innovate. Inside are: Tools--tips on how to build everything from furniture, to wall treatments, and rigging Situations--scenarios, and layouts for sparking creative activities Insights--bite-sized lessons designed to shortcut your learning curve Space Studies--candid stories with lessons on creating spaces for making, learning, imagining, and connecting Design Template--a framework for understanding, planning, and building collaborative environments Make Space is a new and dynamic resource for activating creativity, communication and innovation across

institutions, corporations, teams, and schools alike. Filled with tips and instructions that can be approached from a wide variety of angles, Make Space is a ready resource for empowering anyone to take control of an environment.

Makeology - Kylie Peppler 2016-05-20
Makeology introduces the emerging landscape of the Maker Movement and its connection to interest-driven learning. While the movement is fueled in part by new tools, technologies, and online communities available to today's makers, its simultaneous emphasis on engaging the world through design and sharing with others harkens back to early educational predecessors including Froebel, Dewey, Montessori, and Papert. Makerspaces as Learning Environments (Volume 1) focuses on making in a variety of educational ecosystems, spanning nursery schools, K-12 environments, higher education, museums, and after-school spaces. Each chapter closes with a set of practical takeaways for educators, researchers, and parents.

50 Dangerous Things (You Should Let Your Children Do) - Gever Tulley 2011-05-03
The perfect kids activity book for every parent looking for ways to help their children learn about the incredible world around us. In a time when children are too often coddled, 50 Dangerous Things (You Should Let Your Children Do) reminds readers that climbing trees is good for the soul, and that a pocket knife is not a weapon. Full of exciting ways children can explore the world around them, this book explains how to "Play with Fire" and "Taste Electricity" while learning about safety. With easy-to-follow instructions, it includes: • Activities, like walking a tightrope • Skills, like throwing a spear • Projects, like melting glass • Experiences, like sleeping in the wild As it guides you through these childlike challenges and more, 50 Dangerous Things (You Should Let Your Children Do) will inspire the whole household to embrace a little danger.

The Intentional Makerspace - Dale Grover 2020-09-07
A practical approach to operating a makerspace safely and efficiently.

Maker-Centered Learning - Edward P. Clapp 2016-11-14
The Agency by Design guide to implementing maker-centered teaching and learning Maker-Centered Learning provides both a theoretical framework and practical resources for the educators, curriculum developers, librarians, administrators, and parents navigating this burgeoning field. Written by the expert team from the Agency by Design initiative at Harvard's Project Zero, this book Identifies a set of educational practices and ideas that define maker-centered learning, and introduces the focal concepts of maker empowerment and sensitivity to design. Shares cutting edge research that provides evidence of the benefits of maker-centered learning for students and education as a whole. Presents a clear Project Zero-based framework for maker-centered teaching and learning Includes valuable educator resources that can be applied in a variety of design and maker-centered learning environments Describes unique thinking routines that foster the primary maker capacities of looking closely, exploring complexity, and finding opportunity. A surge of voices from government, industry, and education have argued that, in order to equip the next generation for life and work in the decades ahead, it is vital to support maker-centered learning in various educational environments. Maker-Centered Learning provides insight into what that means, and offers tools and knowledge that can be applied anywhere that learning takes place.

The Big Book of Makerspace Projects: Inspiring Makers to Experiment, Create, and Learn - Colleen Graves 2016-11-11
Start-to-finish, fun projects for makers of all types, ages, and skill levels! This easy-to-follow guide features dozens of DIY, low-cost projects that will arm you with the skills necessary to dream up and build your own creations. The Big Book of Makerspace Projects: Inspiring Makers to Experiment, Create, and Learn offers practical tips for beginners and open-ended challenges for advanced makers. Each project features non-technical, step-by-step instructions with photos and illustrations to ensure success and expand your imagination. You will learn recyclables hacks, smartphone tweaks, paper circuits, e-textiles, musical instruments, coding and programming, 3-D printing, and much, much more! Discover how to create: • Brushbot warriors, scribble machines, and balloon hovercrafts • Smartphone illusions, holograms, and projections • Paper circuits, origami, greeting cards, and pop-ups • Dodgeball, mazes, and other interesting Scratch games • Organs, guitars, and percussion instruments • Sewed LED bracelets, art cuffs, and Arduino stuffie • Makey Makey and littleBits gadgets • Programs for plug-and-play and Bluetooth-enabled robots • 3D design and printing projects and enhancements

Timeless Learning - Ira Socol 2018-08-07
Reinvent public schools with proven, innovative practices Our homes, communities, and the world itself need the natural assets our children bring with them as learners, and which they often lose over time on the assembly line that pervades most of the public education system today. We see no actions as more important in school than developing, supporting, and reinforcing children's sense of agency, the value of their voices, and their potential to influence their own communities. In Timeless Learning, an award-winning team of leaders, Chief Technology Officer Ira Socol, Superintendent Pam Moran, and Lab Schools Principal Chad Ratliff demonstrate how you can implement innovative practices that have shown remarkable success. The authors use progressive design principles to inform pathways to disrupt traditions of education today and show you how to make innovations real that will have a timeless and meaningful impact on students, keeping alive the natural curiosity and passion for learning with which children enter school. Discover the power of project-based and student-designed learning Find out what "maker learning" entails Launch connected and interactive digital learning Benefit from the authors' "opening up learning" space and time Using examples from their own successful district as well as others around the country, the authors create a deep map of the processes necessary to move from schools in which content-driven, adult-determined teaching has been the traditional norm to new learning spaces and communities in which context-driven, child-determined learning is the progressive norm.

Invent to Learn - Sylvia Libow Martinez 2013
"Join the learning revolution sweeping the globe! 3D printers, robotics, programming, wearable computing, and Arduino capture the imaginations of today's student. When exciting new technologies combine with hands-on traditions, your classroom becomes a makerspace where learning soars. The time is now to place invention and creativity ahead of worksheets and testing. Using technology to make, repair, or customize the things we need democratizes engineering, design, and computer science. Fortunately for educators, this maker movement overlaps with the natural inclinations of children and the power of learning by doing. Making, tinkering, and engineering are how people learn and work in the 21st Century. This book explores how you can join the exciting maker movement and turn any K-12 classroom into a center of innovation." -- Back cover.

The Invent to Learn Guide to Making in the K-3 Classroom - Alice Baggett 2016-06-22
The Invent to Learn Guide to Making in the K-3 Classroom: Why, How, and Wow! is a practical guide for primary school educators who want to inspire their students to embrace a tinkering mindset so they can invent fantastic contraptions. Veteran teacher Alice Baggett shares her expertise in how to create hands-on learning experiences for young inventors so students experience the thrilling process of making-complete with epic fails and spectacular discoveries. In this full color book loaded with photos, Alice provides ideas, resources, and practical advice about learning space design, plus gathering materials and doing more with less. STEM curriculum objectives and connections combine with inventive open-ended challenges for grades K-3 with programming, electronics, and 3D design. The rapid changes in technology coupled with Alice's desire to help her young students create and not just consume led her to incorporate as many

building challenges within the curriculum as possible. Before long, she had a closet full of motors, LEDs, pom-poms, and googly eyes. Her students consistently wow with their wacky inventions and technological fluency. This book is aimed at educators of primary school students who want to teach STEM and other subjects in a hands-on, minds-on way that engages and delights. The maker movement is sweeping through schools and the nation, and this book is an essential guidebook for joining in the fun!

Challenge-Based Learning in the School Library Makerspace - Colleen Graves 2017-07-19
An invaluable how-to text that details the workshop model, addresses the design challenges, and explains the best avenues for curriculum-based learning in the school library makerspace. • Explores crowdsourced research methods that lead to authentic participatory learning • Ensures that student-led workshops and design challenges result in tremendous success • Supplies practical tips that can be applied by beginner maker-librarians and provides curricula suggestions for advanced maker-librarians • Explains how to incorporate design thinking, empathy building, and problem solving with design challenges that spur student creativity

Redesigning Learning Spaces - Robert Dillon 2016-05-04
It is time for the desks to lose and the children to win Bring hope, joy, and positive energy back into the daily work of the classroom. Explore how learning space design can positively impact classroom learning, the culture of a school, healthy communities, and systems and structures that make education meaningful. In this book you'll: Find resources for redesigning spaces on a sustainable budget Support technology integration through b¬¬lended and virtual learning Hear success stories from the field The Corwin Connected Educators series is your key to unlocking the greatest resource available to all educators: other educators. Being a Connected Educator is more than a set of actions; it's a belief in the potential of technology to fuel lifelong learning. To explore the other books in this series, visit the Corwin Connected Educators website. Check out the Connected Educator Series matrix to find out which book is right for you. "Redesigning Learning Spaces will take you beyond the standard classroom with ideas for creating spaces that sizzle with excitement and glow with beauty and grace." —Daniel H. Pink, author of Drive and A Whole New Mind "As a son of teachers, as a parent, and as a technologist, I recommend this book for educators who want to create a better learning experience for our children." —Gary Shapiro, author of Ninja Innovation and The Comeback

Engineering in Elementary STEM Education - Christine M. Cunningham 2017
This comprehensive introduction will help elementary educators integrate engineering into their classroom, school, or district in age-appropriate, inclusive, and engaging ways. Building on the work of a Museum of Science team that has spent 15 years developing elementary engineering curricula, this book outlines how engineering can be integrated into a broader STEM curriculum, details its pedagogical benefits to students, and includes classroom examples to help educators tailor instruction to engage diverse students. Featuring vignettes, case studies, videos, research results, and assessments, this resource will help readers visualize high-quality elementary engineering and understand the theoretical principles in context. Book Features: Frameworks to help teachers create curricula and structure activities.A focus on engaging the diversity of learners in today's classrooms.Experiences from the nation's leading elementary education curriculum that has reached 13.3 million children and 165,000 educators. "Wondering how to infuse engineering into your teaching and curriculum? Here's the book for you!" —From the Foreword by Richard A. Duschl, Penn State University "Schools or districts looking to introduce engineering in ways that enhance science and mathematics learning can use the inclusive teaching strategies in this book." —Linda Curtis-Bey, executive director of STEM, NYC Department of Education "Dr. Cunningham lays out an innovative and achievable vision for elementary school engineering that engages all students." —Heidi Carlone, The University of North Carolina at Greensboro

The Invent to Learn Guide to Fun - Josh Burker 2015-05-07
Features an assortment of insanely clever classroom-tested "maker" projects for learners of all ages.

Invent To Learn - Sylvia Libow Martinez 2016-09-17
Now in hardcover, this practical guide has become known worldwide as the "bible of the classroom maker movement." It provides K-12 educators with the how, why, and cool stuff that supports every classroom becoming a makerspace where kids and teachers learn together through direct experience with an

assortment of high and low-tech materials.

Learning in the Making - Jackie Gerstein 2019-08-27
Making is a dynamic and hands-on learning experience that directly connects with long-established theories of how learning occurs. Although it hasn't been a focus of traditional education or had a prominent place in the classroom, teachers find it an accessible, exciting option for their students. The maker movement brings together diverse communities dedicated to creating things through hands-on projects. Makers represent a growing community of builders and creators—engineers, scientists, artists, DIYers, and hobbyists of all ages, interests, and skill levels—who engage in experimentation and cooperation. Transferring this innovative, collaborative, and creative mindset to the classroom is the goal of maker education. A makerspace isn't about the latest tools and equipment. Rather, it's about the learning experiences and opportunities provided to students. Maker education spaces can be as large as a school workshop with high-tech tools (e.g., 3D printers and laser cutters) or as small and low-tech as the corner of a classroom with bins of craft supplies. Ultimately, it's about the mindset—not the "stuff." In Learning in the Making, Jackie Gerstein helps you plan, execute, facilitate, and reflect on maker experiences so both you and your students understand how the knowledge, skills, and attitudes of maker education transfer to real-world settings. She also shows how to seamlessly integrate these activities into your curriculum with intention and a clearly defined purpose.

Mindstorms - Seymour A. Papert 2020-10-06
In this revolutionary book, a renowned computer scientist explains the importance of teaching children the basics of computing and how it can prepare them to succeed in the ever-evolving tech world. Computers have completely changed the way we teach children. We have Mindstorms to thank for that. In this book, pioneering computer scientist Seymour Papert uses the invention of LOGO, the first child-friendly programming language, to make the case for the value of teaching children with computers. Papert argues that children are more than capable of mastering computers, and that teaching computational processes like de-bugging in the classroom can change the way we learn everything else. He also shows that schools saturated with technology can actually improve socialization and interaction among students and between students and teachers. Technology changes every day, but the basic ways that computers can help us learn remain. For thousands of teachers and parents who have sought creative ways to help children learn with computers, Mindstorms is their bible.

Worlds of Making - Laura Fleming 2015-01-30
Makerspaces: Your questions answered here! Get the nuts and bolts on imagining, planning, creating, and managing a cutting-edge Makerspace for your school community. Nationally recognized expert Laura Fleming provides all the answers in this breakthrough guide. From inception through implementation, you'll find invaluable guidance for creating a vibrant Makerspace on any budget. Practical strategies and anecdotal examples help you: Create an action plan for your own personalized Makerspace Align activities to standards Showcase student creations Use this must-have guide to painlessly build a robust, unique learning environment that puts learning back in the hands of your students!

The Skeptical Visionary - Seymour Bernard Sarason 2003
Seymour Sarason, in the words of Carl Glickman, is "one of America's seminal thinkers about public education." For over four decades his has been a voice of much-needed skepticism about our plans for school reform, teacher training, and educational psychology. Now, for the first time, Sarason's essential writings on these and other issues are collected together, offering student and researcher alike with the range, depth, and originality of Sarason's contributions to American thinking on schooling. As we go from debate to debate on issues such as school choice, charter schools, inclusive education, national standards, and other problems that seem to drag on without solution, Sarason's critical stance on the folly of many of our attempts to fix schools has always had at the center a concern for the main players in our educational institutions: the students, the teachers and the parents. Any plans that cannot account for their well-being are doomed to failure. And in the face of such failure, the clarity of Sarason's vision for real educational success is a much-needed antidote to much of the rhetoric that currently passes for substantial debate. A wide-ranging and comprehensive selection of Sarason's most significant writings,The Skeptical Visionaryshould find a prized space on any student's or teacher's bookshelf. Author note:Robert Friedis

Associate Professor in the School of Education at Northeastern University, and is the author ofThe Passionate Teacher: A Practical GuideandThe Passionate Learner: How Teachers and Parents Can Help Children Reclaim the Joy of Discovery.Seymour Sarasonis Professor Emeritus in the Department of Psychology at Yale University. He is the author of over forty books and is considered to be one of the most significant researchers in education and educational psychology in the country.

The Art of Tinkering - Karen Wilkinson 2014-02-04
Some of the most creative artists from today's maker scene discuss their process, workspaces and more in this inspiring guide to tinkering. The Art of Tinkering is an unprecedented celebration of what it means to tinker: to take things apart, explore tools and materials, and build wondrous, wild art that's part science, part technology, and entirely creative. Join 150+ makers as they share the stories behind their beautiful and bold work—then do some tinkering yourself! This collection of exhibits, artwork, and projects explores a whole new way to learn, in which people expand their knowledge through making and doing, working with readily available materials, getting their hands dirty, collaborating with others, and problem-solving in the most fun sense of the word. Each artist featured in The Art of Tinkering shares their process and the backstory behind their work. Whether it's dicussing their favorite tools (who knew toenail clippers could be so handy?) or offering a glimpse of their workspaces (you'd be amazed how many electronics tools you can pack into a pantry!), the stories, lessons, and tips in The Art of Tinkering offer a fascinating portrait of today's maker scene. Artists include: Scott Weaver, Arthur Ganson, Moxie, Tim Hunkin, AnnMarie Thomas, Ranjit Bhatnajar and Jie Qi.

Computer Science in K-12 - Shuchi Grover 2020-04
Coding teaches our students the essence of logical thinking and problem solving while also preparing them for a world in which computing is becoming increasingly pervasive. While there's excitement and enthusiasm about programming becoming an intrinsic part of K-12 curricula the world over, there's also growing anxiety about preparing teachers to teach effectively at all grade levels.This book strives to be an essential, enduring, practical guide for every K-12 teacher anywhere who is either teaching or planning to teach computer science and programming at any grade level. To this end, readers will discover:? An A-to-Z organization that affords comprehensive insight into teaching introductory programming.? 26 chapters that cover foundational concepts, practices and well-researched pedagogies related to teaching introductory programming as an integral part of K-12 computer science. Cumulatively these chapters address the two salient building blocks of effective teaching of introductory programming-what content to teach (concepts and practices) and how to teach (pedagogy).? Concrete ideas and rich grade-appropriate examples inspired by practice and research for classroom use.? Perspectives and experiences shared by educators and scholars who are actively practicing and/or examiningthe teaching of computer science and programming in K-12 classrooms.

Learning to Code - An Invitation to Computer Science Through the Art and Patterns of Nature (Snap! Edition) - David D Thornburg 2021-11-14
This is a book about discovery-the discoveries each of us can make when finding beauty in geometric patterns, beauty in mathematics, and beauty in computer programming. This is also a guide for teaching children to program computers in uniquely powerful ways. It is easy to see how one might find beauty in geometric patterns; this beauty forms the foundation of nature and art. We are continually entranced by geometric form-the symmetry of a butterfly's wings, the spiral of a snail's shell, the facets of a crystal-and each of these natural occurrences is perceived as having beauty associated with it. The hands of people have produced geometric art since marks were first made on cave walls or stones were first fashioned into tools. From the Pyramids and the Parthenon to the finest gold-link chain, the beauty of geometric form is clearly present for all who care to find it. Underlying the geometric pattern that we experience with our eyes lies a more subtle pattern of mathematical beauty, which is experienced intellectually-a collection of unifying principles that govern the arrangement and shapes of objects, both natural and crafted. Computer programming offers a bridge between the worlds of nature, design, and intellect. The computer today can be a tool for discovery and creative expression. It can be as malleable as a piece of clay and as powerful as the very ideas it helps to express. You do not have to be good at math or accept the passive ways computers are often used in classrooms. Thornburg's approach is eye-opening. The programming language used in this

book is Snap! Snap! is a free block-based programming language designed at UC Berkeley that can be used on any device with a web browser. It looks a lot like Scratch, but adds a great deal of functionality and was designed to teach computer science concepts like those found in the NSF-funded Beauty and Joy of Computing Course. These added capabilities make it suitable for a serious introduction to computer science for high school or college students. Like Scratch, Snap! is in the Logo family of programming languages. The Logo programming language was designed for learning and its various dialects have been used by millions of learners for more than half a century. With Logo, students experience powerful ideas, solve problems, and create while engaging in conversation with the computer. Although coding is often thought of in vocational terms, Logo programming lies squarely in the grand traditions of the liberal arts and progressive education.

International Handbook of Technology Education - 2006-01-01
This first volume in the International Technology Education Series offers a unique, worldwide collection of national surveys into the developments of Technology Education in the past two decades.

Step Into STEAM, Grades K-5 - Sarah B. Bush 2019-03-14
Create meaningful and transformative K-5 STEAM learning experiences for each and every student Make the most of your limited instructional time and become part of the Step into STEAM movement! Seamlessly design and implement K-5 STEAM inquiries that align carefully to key mathematics and science content and practices and prepare elementary students for their bright futures. Taking an opposite approach to existing resources that provide collections of disjointed STEAM activities, this book empowers teachers and schools to build cohesive and sustainable STEAM infrastructures—grounded in grade-level standards and purposeful assessment—to deepen the mathematics and science learning of each and every student.

Your Starter Guide to Makerspaces - Nicholas Provenzano 2016-09-22
Schools around the country are designing maker spaces to spark creativity. Students learn best when they are able to create and tinker and make. But how do you even begin when there are so many terms floating around? This book provides a fun, practical, and approachable framework for any teacher curious about getting started with maker spaces. I've never had so much fun reading a professional book, ever. Somehow each chapter is equal parts hilarious, gleeful, inspiring and practical. I would recommend to this every educator I know and even parents and students. This is a book you can come back to again and again to laugh learn and make each time in a new way. - Jennie Magiera, Educator and Author of Courageous Edventures Your Starter Guide To Makerspaces makes any Hufflepuff feel like they can tackle the maker movement with the brains of a Ravenclaw, confidence of a Gryffindor, and cleverness of a Slytherin. Emily Gover - Edtech Nerd & Librarian

The Invent to Learn Guide to 3D Printing in the Classroom - David D. Thornburg 2014-06-01
"3D printing will be bigger than the Web." Chris Anderson, former editor-in-chief of Wired magazine This book is an essential guide for educators interested in bringing the amazing world of 3D printing to their classrooms. Learn about the technology, exciting powerful new design software, and even advice for purchasing your first 3D printer. The real power of the book comes from a variety of teacher-tested step-by-step classroom projects. Eighteen fun and challenging projects explore science, technology, engineering, and mathematics, along with forays into the visual arts and design. The Invent To Learn Guide to 3D Printing in the Classroom is written in an engaging style by authors with decades of educational technology experience.

Making and Tinkering with STEM - Cate Heroman 2017
Explore STEM concepts through making and tinkering!

Zero to Maker - David Lang 2013-08-26
Are you possessed by the urge to invent, design, and make something that others enjoy, but don't know how to plug into the Maker movement? In this book, you'll follow author David Lang's headfirst dive into the Maker world and how he grew to be a successful entrepreneur. You'll discover how to navigate this new community, and find the best resources for learning the tools and skills you need to be a dynamic maker in your own right. Lang reveals how he became a pro maker after losing his job, and how the experience helped him start OpenROV—a DIY community and product line focused on open source undersea exploration. It all happened once he became an active member of the Maker culture. Ready to take the

plunge into the next Industrial Revolution? This guide provides a clear and inspiring roadmap. Take an eye-opening journey from unskilled observer to engaged maker-entrepreneur Enter the Maker community to connect with experts and pick up new skills Use a template for building a maker-based entrepreneurial lifestyle Learn from the organizer of the first-ever Maker Startup Weekend Be prepared for exciting careers of the future

Art of Doing Science and Engineering - Richard R. Hamming 2003-12-16
Highly effective thinking is an art that engineers and scientists can be taught to develop. By presenting actual experiences and analyzing them as they are described, the author conveys the developmental thought processes employed and shows a style of thinking that leads to successful results is something that can be learned. Along with spectacular successes, the author also conveys how failures contributed to shaping the thought processes. Provides the reader with a style of thinking that will enhance a person's ability to function as a problem-solver of complex technical issues. Consists of a collection of stories about the author's participation in significant discoveries, relating how those discoveries came about and, most importantly, provides analysis about the thought processes and reasoning that took place as the author and his associates progressed through engineering problems.

Design, Make, Play - Margaret Honey 2013-03-12
Design, Make, Play: Growing the Next Generation of STEM Innovators is a resource for practitioners, policymakers, researchers and program developers that illuminates creative, cutting edge ways to inspire and motivate young people about science and technology learning. The book is aligned with the National Research Council's new Framework for Science Education, which includes an explicit focus on engineering and design content, as well as integration across disciplines. Extensive case studies explore real world examples of innovative programs that take place in a variety of settings, including schools, museums, community centers, and virtual spaces. Design, Make, and Play are presented as learning methodologies that have the power to rekindle children's intrinsic motivation and innate curiosity about STEM (science, technology, engineering, and mathematics) fields. A digital companion app showcases rich multimedia that brings the stories and successes of each program—and the students who learn there—to life.

Launch - John Spencer 2016-05-15
Something happens in students when they define themselves as makers and inventors and creators. They discover powerful skills-problem-solving, critical thinking, and imagination-that will help them shape the world's future ... our future. If that's true, why isn't creativity a priority in more schools today? Educators John Spencer and A.J. Juliani know firsthand the challenges teachers face every day: School can be busy. Materials can be scarce. The creative process can seem confusing. Curriculum requirements can feel limiting. Those challenges too often bully creativity, pushing it to the side as an "enrichment activity" that gets put off or squeezed into the tiniest time block. We can do better. We must do better if we're going to prepare students for their future. LAUNCH: Using Design Thinking to Boost Creativity and Bring Out the Maker in Every Student provides a process that can be incorporated into every class at every grade level ... even if you don't consider yourself a "creative teacher." And if you dare to innovate and view creativity as an essential skill, you will empower your students to change the world-starting right now. Look, Listen, and Learn Ask Lots of Questions Understand the Problem or Process Navigate Ideas Create Highlight What's Working and Failing Are you ready to LAUNCH?

Engineering Education for the Next Generation: A Nature-Inspired Approach - Samuel Cord Stier 2020-03-10
Guide your students through the fascinating world of engineering, and how to draw inspiration from Nature's genius to create, make, and innovate a better human-built world. Studded with more than 150 illustrations of natural phenomena and engineering concepts, this fascinating and practical book clearly demonstrates how engineering design is broadly relevant for all students, not just those who may become scientists or engineers. Mr. Stier describes clever, engaging activities for students at every grade level to grasp engineering concepts by exploring the everyday design genius of the natural world around us. Students will love learning about structural engineering while standing on eggs; investigating concepts in sustainable design by manufacturing cement out of car exhaust; and coming to understand how ant behavior has revolutionized the way computer programs, robots, movies, and video games are designed

today. You will come away with an understanding of engineering and Nature unlike any you've had before, while taking your ability to engage students to a whole new level. Engineering Education for the Next Generation is a wonderful introduction to the topic for any teacher who wants to understand more about engineering design in particular, its relation to the larger subjects of STEM/STEAM, and how to engage students from all backgrounds in a way that meaningfully transforms their outlook on the world and their own creativity in a lifelong way. · Fun to read, comprehensive exploration of cutting-edge approaches to K-12 engineering education · Detailed descriptions and explanations to help teachers create activities and lessons · An emphasis on engaging students with broad and diverse interests and backgrounds · Insights from a leading, award-winning K-12 engineering curriculum that has reached thousands of teachers and students in the U.S. and beyond · Additional support website (www.LearningWithNature.org) providing more background, videos, curricula, slide decks, and other supplemental materials

Invent to Learn - Sylvia Libow Martinez 2019-01-05
A new and expanded edition of one of the decade's most influential education books. In this practical guide, Sylvia Martinez and Gary Stager provide K-12 educators with the how, why, and cool stuff that supports making in the classroom, library, makerspace, or anywhere learners learn.

Anna, Kid Engineer - Shenek Alston 2018-03-13
It is once again time for the Science Fair. Anna isn't excited about the event because of the embarrassing projects she came up with during her 3rd and 4th grade years. Anna likes to tinker, but what does that have to do with a science fair project? In the process of trying to figure out a project, Anna discovers that she is a kid engineer!

Makeology - Kylie Peppler 2016-05-20
Makeology introduces the emerging landscape of the Maker Movement and its connection to interest-driven learning. While the movement is fueled in part by new tools, technologies, and online communities available to today's makers, its simultaneous emphasis on engaging the world through design and sharing with others harkens back to early educational predecessors including Froebel, Dewey, Montessori, and Papert. Makers as Learners (Volume 2) highlights leading researchers and practitioners as they discuss and share current perspectives on the Maker movement and research on educational outcomes in makerspaces. Each chapter closes with a set of practical takeaways for educators, researchers, and parents.

Programming Arduino Getting Started with Sketches - Simon Monk 2011-12-22
Program Arduino with ease! Using clear, easy-to-follow examples, Programming Arduino: Getting Started with Sketches reveals the software side of Arduino and explains how to write well-crafted sketches using the modified C language of Arduino. No prior programming experience is required! The downloadable sample programs featured in the book can be used as-is or modified to suit your purposes. Understand Arduino hardware fundamentals Install the software, power it up, and upload your first sketch Learn C language basics Write functions in Arduino sketches Structure data using arrays and strings Use Arduino's digital and analog inputs and outputs in your programs Work with the Standard Arduino Library Write sketches that can store data Program LCD displays Use an Ethernet shield to enable Arduino to function as a web server Write your own Arduino libraries In December 2011, Arduino 1.0 was released. This changed a few things that have caused two of the sketches in this book to break. The change that has caused trouble is that the classes 'Server' and 'Client' have been renamed to 'EthernetServer' and 'EthernetClient' respectively. To fix this: Edit sketches 10-01 and 10-02 to replace all occurrences of the word 'Server' with 'EthernetServer' and all occurrences of 'Client' with 'EthernetClient'. Alternatively, you can download the modified sketches for 10-01 and 10-02 from here: http://www.arduinobook.com/arduino-1-0 Make Great Stuff! TAB, an imprint of McGraw-Hill Professional, is a leading publisher of DIY technology books for makers, hackers, and electronics hobbyists.

Technology Integration for Meaningful Classroom Use: A Standards-Based Approach - Katherine Cennamo 2013-01-01
Updated and streamlined for easier use, TECHNOLOGY INTEGRATION FOR MEANINGFUL CLASSROOM USE: A STANDARDS-BASED APPROACH, Second Edition, equips readers with the knowledge, creative and critical thinking skills, and confidence needed to become self-directed learners who can successfully navigate the constantly changing environment of technology integration in the classroom. Using the principles of self-directed learning as its foundation, the book aims to help readers learn to evaluate and reflect on professional practice to make informed decisions regarding the use of technology in support of student learning. The first educational technology book organized around the 2008 National Educational Technology Standards for Teachers (NETS-T) developed by the International Society for Technology in Education (ISTE), this standards-based approach provides the framework for developing, modeling, and teaching the skills and knowledge necessary for integrating technology in authentic teaching and learning. An end-of-book supplement provides examples of technology integration in practice within specific content areas, guided by the national standards that apply to each content domain. Available with InfoTrac Student Collections http://gocengage.com/infotrac. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Twenty Things to Do with a Computer Forward 50 - Gary S. Stager 2021-11-22
In 1971, Cynthia Solomon and Seymour Papert published Twenty Things to Do with a Computer, a revolutionary document that would set the course of education for the next fifty years and beyond. This book, Twenty Things to Do with a Computer Forward 50, is a celebration of the vision set forth by Papert and Solomon a half-century ago. Four dozen experts from around the world invite us to consider the original provocations, reflect on their implementation, and chart a course for the future through personal recollections, learning stories, and imaginative scenarios. Twenty Things to Do with a Computer Forward 50 can inspire parents, educators, and aspiring teachers to make the world a better place for learning. The impact of Twenty Things is all around us. In 1971, Solomon and Papert predicted 1:1 personal computing, the maker movement, the rise of computational thinking, children programming computers, robotic construction kits, computer science for all, and integrating computing across the curriculum. All of this, years, or even decades, before such notions became more commonplace. In fewer than thirty pages, Twenty Things to Do with a Computer introduced readers to an exciting world in which children use computers they own to create, solve problems, control their world, and bring powerful ideas to life across subject areas. More importantly, Twenty Things situates the ideals of progressive education in a modern context. Papert and Solomon demonstrated how computing could be creative, humane, whimsical, childlike, and a way to learn "everything else," even ideas at the frontiers of mathematics and science. Contributors to this book include scholars and tech pioneers who worked with Papert and Solomon in the 1970s, phenomenal classroom teachers, inventors, researchers, school administrators, university professors, and educational technology leaders. Essays in this collection offer multiple pathways for school reform. Authors include Cynthia Solomon, Sugata Mitra, Conrad Wolfram, Audrey Watters, David Thornburg, Yasmin Kafai, Dale Dougherty, Nettrice Gaskins, Dan Lynn Watt, Molly Lynn Watt, Gary Stager, Artemis Papert, Stephen Heppell, along with forty other brilliant thinkers and legendary educators. Twenty Things to Do with a Computer Forward 50 is an effort to preserve a historical document and share it with future of generations seeking a more creative, personal, empowering, and meaningful educational experience for young people. This book is a must-read for: Educators School leaders Preservice teachers Policymakers Technology developers Parents