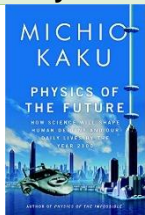


S SCIENCE T TECHNOLOGY E ENGINEERING M MATH

The Physics of the Future: How Science will Shape Human Destiny and Our Daily Lives by the Year 2100

Kaku, Michio

303.48 KAK



Imagine, if you can, the world in the year 2100.

In *Physics of the Future*, Michio Kaku—the New York Times bestselling author of *Physics of the Impossible*—gives us a stunning, provocative, and exhilarating vision of the coming century based on interviews with over three hundred of the world’s top scientists who are already inventing the future in their labs. The result is the most authoritative and scientifically accurate description of the revolutionary developments taking place in medicine, computers, artificial intelligence, nanotechnology, energy production, and astronautics.

In all likelihood, by 2100 we will control computers via tiny brain sensors and, like magicians, move objects around with the power of our minds. Artificial intelligence will be dispersed throughout the environment, and Internet-enabled contact lenses will allow us to access the world’s information base or conjure up any image we desire in the blink of an eye.

Meanwhile, cars will drive themselves using GPS, and if room-temperature superconductors are discovered, vehicles will effortlessly fly on a cushion of air, coasting on powerful magnetic fields and ushering in the age of magnetism.

Using molecular medicine, scientists will be able to grow almost every organ of the body and cure genetic diseases. Millions of tiny DNA sensors and nanoparticles patrolling our blood cells will silently scan our bodies for the first sign of illness, while rapid advances in genetic research will enable us to slow down or maybe even reverse the aging process, allowing human life spans to increase dramatically.

In space, radically new ships—needle-sized vessels using laser propulsion—could replace the expensive chemical rockets of today and perhaps visit nearby stars. Advances in nanotechnology may lead to the fabled space elevator, which would propel humans hundreds of miles above the earth’s atmosphere at the push of a button.

But these astonishing revelations are only the tip of the iceberg. Kaku also discusses emotional robots, antimatter rockets, X-ray vision, and the ability to create new life-forms, and he considers the development of the world economy. He addresses the key questions: Who are the winner and losers of the future? Who will have jobs, and which nations will prosper?

All the while, Kaku illuminates the rigorous scientific principles, examining the rate at which certain technologies are likely to mature, how far they can advance, and what their ultimate limitations and hazards are. Synthesizing a vast amount of information to construct an exciting look at the years leading up to 2100, *Physics of the Future* is a thrilling, wondrous ride through the next 100 years of breathtaking scientific revolution.

Science in Seconds: 200 Key Concepts Explained in an Instant

Muir, Hazel

500 MUI



Science in Seconds explains 200 of the most important concepts in various branches of science. The book uses easily understood language and clear illustrations for each concept, making it ideal for those with little or no experience in the sciences. Readers can gain a preliminary understanding and may be motivated to seek more information. Generous cross-referencing and a glossary of terms add clarity and context.

The book explains key concepts in the following subjects:

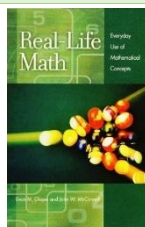
Physics, Chemistry, Biology, Ecology, Biotechnology, Anatomy and physiology, Medicine, Earth science, Energy generation, Astronomy, Space flight, Information technology

Science in Seconds is an excellent resource for students recently introduced to these concepts and as a quick-look reference for interested readers.

Real-Life Math: Everyday Use of Mathematical Concepts

Glazer, Evan & MacConnell, John W

510 GLA

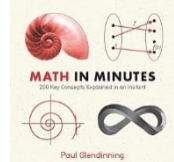


What does this have to do with real life? is a question that plagues mathematics teachers across America, as students are confronted with abstract topics in their high school mathematics courses. The National Council of Teachers of Mathematics emphasizes the importance of making real world connections in teaching mathematics so that learning new content is meaningful to students. And in meeting NCTM national standards, this invaluable book provides many insights into the many connections between mathematics applications and the real world. Nearly 50 math concepts are presented with multiple examples of how each is applied in everyday environments, such as the workplace, nature, science, sports, and even parking. From logarithms to matrices to complex numbers, concepts are discussed for a variety of mathematics courses, including: • algebra • geometry • trigonometry • analysis • probability • statistics • calculus

In one entry, for example, the authors show how angles are used in determining the spaces of a parking lot. When describing exponential growth, the authors demonstrate how interest on a loan or credit card increases over time. The concept of equations is described in a variety of ways, including how business managers estimate how many hours it takes a certain number of employees to complete a task, as well as how a

compute a quarterback's passing rating. Websites listed at the end of each entry provide additional examples of everyday math for both students and teachers.

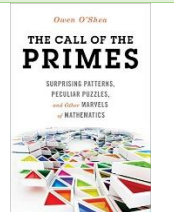
Math in Minutes: 200 Key Concepts Explained in an Instant	Glendinning, Paul	510 GLE
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Paul Glendinning is Professor of Applied Mathematics at the University of Manchester. He was founding Head of School for Mathematics at the combined University of Manchester and has published over fifty academic articles and an undergraduate textbook on chaos theory.

Both simple and accessible, Math in Minutes is a visually led introduction to 200 key mathematical concepts. Each concept is described by means of an easy-to-understand illustration and a compact, 200-word explanation. Concepts span all of the key areas of mathematics, including Fundamentals of Mathematics, Sets and Numbers, Geometry, Equations, Limits, Functions and Calculus, Vectors and Algebra, Complex Numbers, Combinatorics, Number Theory, and more.

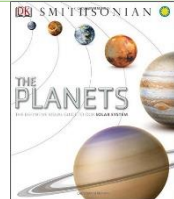
The Call of the Primes: Surprising Patterns, Peculiar Puzzles, and Other Marvels of Mathematics	O'Shea, Owen	510 OSH
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This sampler of entertaining mathematical diversions reveals the elegance and extraordinary usefulness of mathematics for readers who think they have no aptitude for the subject. If you like any kind of game at all, you'll enjoy the amazing mathematical puzzles and patterns presented here in straightforward terms that any layperson can understand. From magic squares and the mysterious qualities of prime numbers to Pythagorean triples, probability theory, the Fibonacci sequence, and more, the author shows that math can be fun while having some profound implications.

Such ubiquitous mathematical entities as pi and the Fibonacci numbers are found throughout the natural world and are also the foundation of our technological civilization. By exploring the intriguing games presented here, you'll come away with a greater appreciation for the beauty and importance of these and many more math concepts.

The Planets: The Definitive Visual Guide to Our Solar System	Dinwiddie, Robert...	523 COU
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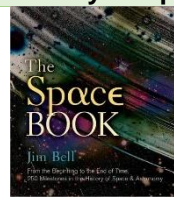


Featuring all-new 3D models built using data gathered by NASA and the European Space Agency, *The Planets* is an awe-inspiring journey through the Solar System, from Earth to Mars and beyond.

Viewed layer by layer, planets and other objects in the Solar System are taken out of the night sky and presented on a white background, revealing every detail of their surface and internal anatomy in astonishing detail.

Looking at planets, the Sun, hundreds of moons and thousands of asteroids and comets, *The Planets* includes timelines that chronicle all major Space missions, right up to the latest Mars rovers, and infographics that present fascinating facts about all planets and the Solar System in a fresh new way.

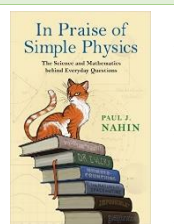
The Space Book: From the Beginning to the End of Time, 250 Milestones in the History of Space & Astronomy	Bell, Jim	523.1 BEL
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We live in a truly golden age of astronomy and space exploration that may allow us to unravel some of the biggest mysteries of all: *How did the Universe begin? Are there other Earth-like planets out there? Are we alone? The Space Book* is a gateway into these kinds of questions—and more—for anyone interested in the worlds beyond our planet.

Expanding the series that began with the highly successful volumes *The Science Book* and *The Math Book*, astronomer and planetary scientist Jim Bell presents 250 of the most groundbreaking astronomical events, from the formation of galaxies to the recent discovery of water ice on Mars. Beautiful photographs or illustrations accompany each entry. Open the book to any page to discover some new wonder or mystery about the Universe around us.

In Praise of Simple Physics: The Science and Mathematics behind Everyday Questions	Nahin, Paul J.	530 NAH
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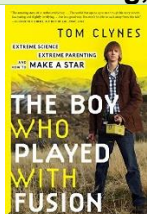


Physics can explain many of the things that we commonly encounter. It can tell us why the night is dark, what causes the tides, and even how best to catch a baseball. With *In Praise of Simple Physics*, popular math and science writer Paul Nahin presents a plethora of situations that explore the science and math behind the wonders of everyday life. Roaming through a diverse range of puzzles, he illustrates how physics shows us ways to wring more energy from renewable sources, to measure the gravity in our car garages, to figure out which of three light switches in the basement controls the light bulb in the attic, and much, much more.

How fast can you travel from London to Paris? How do scientists calculate the energy of an atomic bomb explosion? How do you kick a football so it stays in the air and goes a long way downfield? Nahin begins with simpler problems and progresses to more challenging questions, and his entertaining, accessible, and scientifically and mathematically informed explanations are all punctuated by his trademark humor. Readers are presumed to have some background in beginning differential and integral calculus. Whether you simply have a personal interest in physics' influence in the world or you're an engineering and science student who wants to gain more physics know-how, this book has an intriguing scenario for you.

In Praise of Simple Physics proves that if we look carefully at the world around us, physics has answers for the most astonishing day-to-day occurrences.

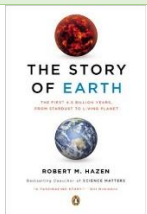
The Boy Who Played with Fusion: Extreme Science, Extreme Parenting, and How to Make a Star	Clynes, Tom	539.7 CLY
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By the age of nine, Taylor Wilson had mastered the science of rocket propulsion. At eleven, his grandmother’s cancer diagnosis inspired him to investigate new ways to produce medical isotopes. And by fourteen, Wilson had built a 500-million-degree reactor and become the youngest person in history to achieve nuclear fusion. How could someone so young achieve so much, and what can Wilson’s story teach parents and teachers about how to support high-achieving kids?

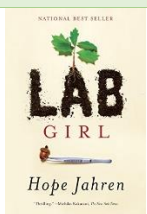
In *The Boy Who Played with Fusion*, science journalist Tom Clynes narrates Taylor’s extraordinary journey—from his Arkansas home, to a unique public high school just for academic superstars, to the present, when Wilson is designing devices to prevent terrorists from shipping radioactive material and inspiring a new generation to take on the challenges of science.

The Story of Earth: The First 4.5 Billion Years, from Stardust to Living Planet	Hazen, Robert M.	550 HAZ
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Hailed by *The New York Times* for writing “with wonderful clarity about science . . . that effortlessly teaches as it zips along,” nationally bestselling author Robert M. Hazen offers a radical new approach to Earth history in this intertwined tale of the planet’s living and nonliving spheres. With an astrobiologist’s imagination, a historian’s perspective, and a naturalist’s eye, Hazen calls upon twenty-first-century discoveries that have revolutionized geology and enabled scientists to envision Earth’s many iterations in vivid detail—from the mile-high lava tides of its infancy to the early organisms responsible for more than two-thirds of the mineral varieties beneath our feet. Lucid, controversial, and on the cutting edge of its field, *The Story of Earth* is popular science of the highest order.

Lab Girl	Jahren, Hope	570.92 JAH
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An illuminating debut memoir of a woman in science; a moving portrait of a longtime friendship; and a stunningly fresh look at plants that will forever change how you see the natural world

Acclaimed scientist Hope Jahren has built three laboratories in which she’s studied trees, flowers, seeds, and soil. Her first book is a revelatory treatise on plant life—but it is also so much more.

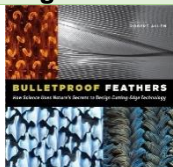
Lab Girl is a book about work, love, and the mountains that can be moved when those two things come together. It is told through Jahren’s remarkable stories: about her childhood in rural Minnesota with an uncompromising mother and a father who encouraged hours of play in his classroom’s labs; about how she found a sanctuary in science, and learned to perform lab work done “with both the heart and the hands”; and about the inevitable disappointments, but also the triumphs and exhilarating

discoveries, of scientific work.

Yet at the core of this book is the story of a relationship Jahren forged with a brilliant, wounded man named Bill, who becomes her lab partner and best friend. Their sometimes rogue adventures in science take them from the Midwest across the United States and back again, over the Atlantic to the ever-light skies of the North Pole and to tropical Hawaii, where she and her lab currently make their home.

Jahren’s probing look at plants, her astonishing tenacity of spirit, and her acute insights on nature enliven every page of this extraordinary book. *Lab Girl* opens your eyes to the beautiful, sophisticated mechanisms within every leaf, blade of grass, and flower petal. Here is an eloquent demonstration of what can happen when you find the stamina, passion, and sense of sacrifice needed to make a life out of what you truly love, as you discover along the way the person you were meant to be.

Bulletproof Feathers: How Science Uses Nature’s Secrets to Design Cutting-Edge Technology	Allen, Robert (editor)	570.1 BUL
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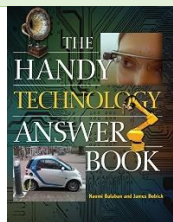
Fabrics that are not only stain resistant but actually clean themselves. Airplane wings that change shape in midair to take advantage of shifts in wind currents. Hypodermic needles that use tiny serrations to render injections virtually pain free.

Though they may sound like the stuff of science fiction, in fact such inventions represent only the most recent iterations of natural mechanisms that are billions of years old—the focus of the rapidly growing field of biomimetics. Based on the realization that natural selection has for countless eons been conducting trial-and-error experiments with the laws of physics, chemistry, material science, and engineering, biomimetics takes nature as its laboratory, looking to the most successful developments and strategies of an array of plants and animals as a source of technological innovation and ideas. Thus the lotus flower, with its waxy, water-resistant surface, gives us stainproofing; the feathers of raptors become transformable airplane wings; and the nerve-deadening serrations on a mosquito’s proboscis are adapted to hypodermics.

With *Bulletproof Feathers*, Robert Allen brings together some of the greatest minds in the field of biomimetics to provide a fascinating—at times even jaw-dropping—overview of cutting-edge research in the field. In chapters packed with illustrations, Steven Vogel explains how architects and building engineers are drawing lessons from prairie dogs, termites, and even sand dollars in order to heat and cool buildings more efficiently; Julian Vincent goes to the very building blocks of nature, revealing how different structures and arrangements of molecules have inspired the development of some fascinating new materials, such as waterproof clothing based on shark skin; Tomonari Akamatsu shows how sonar technology has been greatly improved through detailed research into dolphin communication; Yoseph Bar-Cohen delves into the ways that robotics engineers have learned to solve design problems through reference to human musculature; Jeannette Yen explores how marine

creatures have inspired a new generation of underwater robots; and Robert Allen shows us how cooperative behavior between birds, fish, and insects has inspired technological innovations in fields ranging from Web hosting to underwater exploration.

The Handy Technology Answer Book	Balaban, Naomi & Bobick, James	600 BAL
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Technology pervades our daily lives and modern society, and not just when it comes to computers and smart phones. Before there was the computer, there was the abacus. Before the smart phone, there was the telegraph and ball point pen. Electricity, penicillin, and the compass have all led to revolutionary changes in how we live. The Handy Technology Answer Book explains how technology has revolutionized the way people live, work, and play. It covers a broad range of fields, including medicine, mining, buildings, transportation, the military, and agriculture, and how they have been changed by technology.

From the relationship between science and technology to nanotechnology, robots, and predictions for future technology, The Handy Technology Answer Book presents the latest and historical in an engaging and informative format. It brings well-researched answers to more than 1,100 common questions on technology, such as What are the major time periods of technology? Who is considered to be the first engineer? Which individual was granted the most U.S. patents? What is a Uniform Resource Locator, or URL? What products are made from recycled plastic? Can human beings be cloned? What is the future of wearable technology in health care?

The Shark's Paintbrush: Biomimicry and How Nature Is Inspiring Innovation	Harman, Jay	600 HAR
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Why does the bumblebee have better aerodynamics than a 747? What structural design is shared by a tornado and a blood vessel?

Since the Industrial Revolution, manufacturers have built things by a process known as “heat, beat, and treat.” They use enormous amounts of energy to heat raw material, shape it with heavy machinery, and maintain its design, strength, and durability with toxic chemicals. Now, in a world of depleted natural resources, entrepreneurs and scientists are turning to nature to inspire future products that are more energy- and cost-efficient. Biomimicry, the science of employing nature to advance sustainable technology, is arguably one of the hottest new business concepts. At the center of this growing movement has been award-winning inventor and biomimetic entrepreneur Jay Harman.

In The Shark's Paintbrush, Harman introduces us to pioneering engineers in a wide array of businesses who are uncovering and copying nature's hidden marvels. He shows business leaders and aspiring entrepreneurs how we can reconcile creating more powerful, lucrative technologies with maximizing sustainability. He injects a whole new vocabulary and way of thinking into the business sphere that speaks to both small start-ups and corporate giants.

Women in Tech: Take Your Career to the Next Level with Practical Advice and Inspiring Stories	Wheeler Van Vlack, Tarah	602.3 WOM
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Geared toward women who are considering getting into tech, or those already in a tech job who want to take their career to the next level, this book combines practical career advice and inspiring personal stories from successful female tech professionals Brianna Wu (founder, Giant Spacekat), Angie Chang (founder, Women 2.0), Keren Elazari (TED speaker and cybersecurity expert), Katie Cunningham (Python educator and developer), Miah Johnson (senior systems administrator), Kristin Toth Smith (tech executive and inventor), and Kamilah Taylor (mobile and social developer).

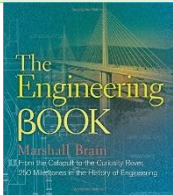
Written by a female startup CEO and featuring a host of other successful contributors, this book will help dismantle the unconscious social bias against women in the tech industry. Readers will learn: · The secrets of salary negotiation · The best format for tech resumes · How to ace a tech interview · The perks of both contracting (W-9) and salaried full-time work · The

secrets of mentorship · How to start your own company · And much more

Perfect for its audience of hackers and coders, the book contains puzzles and code, created as love letters to women in the tech industry. A distinguished anonymous contributor created the Python code for the cover of the book (ghosted in gloss on the hardcover jacket, and also printed on one of the first pages). It references the mother of computer science, Ada Lovelace. Run the code to see what it does!

Mike Selinker and Gaby Weidling of Lone Shark Games, and cryptographer and DefCon puzzle master Ryan “Lostbo” Clarke created an “easter egg” of puzzles throughout the book - readers who decipher the puzzles get a prize from the author!

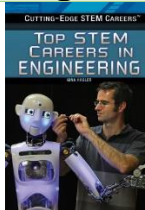
The Engineering Book: From the Catapult to the Curiosity Rover, 250 Milestones in the History of Engineering	Brain, Marshall	620 BRA
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Engineering is where human knowledge meets real-world problems—and solves them. It's the source of some of our greatest inventions, from the catapult to the jet engine. Marshall Brain, creator of the How Stuff Works series and a professor at the Engineering Entrepreneurs Program at NCSU, provides a detailed look at 250 milestones in the discipline. He covers the various areas, including chemical, aerospace, and computer engineering, from ancient history to the present. The topics include architectural wonders like the Acropolis, the Great Wall of China, and the Eiffel Tower; transportation advances such as the high-speed bullet train; medical innovations, including the artificial heart and kidney dialysis; developments in communications, such as the cell phone; as well as air conditioning, Wi-Fi, the Large Hadron Collider, the self-driving car, and

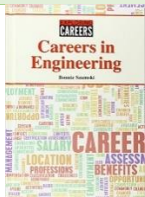
more.

Top STEM Careers in Engineering	Hagler, Gina	620 HAG
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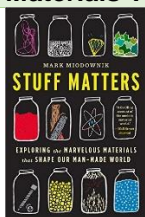
Engineers blend logic and precision with imagination, and science and math principles with vision and foresight, to create solutions for some of society's most pressing problems. From information technology to medicine, public transportation to space travel, engineers work to make innovation a reality. This inspiring book explores a variety of branches of engineering, discussing the opportunities available, typical work environments, and educational credentials needed to enter each field. Readers learn ways to enhance their background by participating in engineering organizations, science clubs, internships, research projects, and community service. Amazing full-color photos of real-life projects illustrate engineering processes in action.

Careers in Engineering	Szumski, Bonnie	620 SZU
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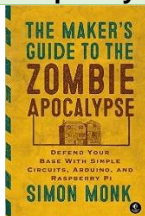
Engineering remains an exciting field and still one of the most highly paid careers you can choose. Comments from people in the industry, current statistics and forecasts, and realistic descriptions provide a useful look at engineering jobs including standard careers such as electrical and mechanical, as well as new and emerging careers such as biomedical.

Stuff Matters: Exploring the Marvelous Materials That Shape Our Man-Made World	Niodownik, Mark	620.1 MIO
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Why is glass see-through? What makes elastic stretchy? Why does any material look and behave the way it does? These are the sorts of questions that renowned materials scientist Mark Miodownik constantly asks himself. Miodownik studies objects as ordinary as an envelope and as unexpected as concrete cloth, uncovering the fascinating secrets that hold together our physical world. In *Stuff Matters*, Miodownik explores the materials he encounters in a typical morning, from the steel in his razor to the foam in his sneakers. Full of enthralling tales of the miracles of engineering that permeate our lives, *Stuff Matters* will make you see stuff in a whole new way.

The Maker's Guide to the Zombie Apocalypse: Defend Your Base with Simple Circuits, Arduino, and Raspberry Pi	Monk, Simon	621.381 MON
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Where will you be when the zombie apocalypse hits? Trapping yourself in the basement? Roasting the family pet? Beheading reanimated neighbors?

No way. You'll be building fortresses, setting traps, and hoarding supplies, because you, savvy survivor, have snatched up your copy of *The Maker's Guide to the Zombie Apocalypse* before it's too late. This indispensable guide to survival after Z-day, written by hardware hacker and zombie anthropologist Simon Monk, will teach you how to generate your own electricity, salvage parts, craft essential electronics, and out-survive the undead.

Take charge of your environment: Monitor zombie movement with trip wires and motion sensor * Keep vigilant watch over your compound with Arduino and Raspberry Pi surveillance systems * Power zombie defense devices with car batteries, bicycle generators, and solar power

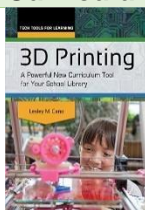
Escape imminent danger: Repurpose old disposable cameras for zombie-distracting flashbangs * Open doors remotely for a successful sprint home * Forestall subplot disasters with fire and smoke detectors

own electricity, salvage parts, craft essential electronics, and out-survive the undead.

Communicate with other survivors: Hail nearby humans using Morse code * Pass silent messages with two-way vibration walkie-talkies * Fervently scan the airwaves with a frequency hopper

For anyone from the budding maker to the keen hobbyist, *The Maker's Guide to the Zombie Apocalypse* is an essential survival tool.

3D Printing: A Powerful New Curriculum Tool for Your School Library	Cano, Lesley M.	621.9 CAN
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This beginner's guide to 3D design and printing provides librarians with lessons, tips, and instructions for integrating these technologies into the K–12 standards-based curriculum.

- Includes an appendix of resources for school librarians to get the most out of three-dimensional design and printing
- Suggests practical lesson ideas for integrating 3D printing into language arts, math, science, and social studies
- Focuses on 3D printing as a tool to engage students in curriculum content and promote hands-on, problem-based learning with a focus on authentic, practical application
- Offers suggestions for policy development and guidelines for managing and implementing this powerful technology

Make: 3D Printing Projects, Toys, Tools, and Contraptions to Print and Build Yourself	Drumm, Brook & Kelly, James Floyd	621.9 DRU
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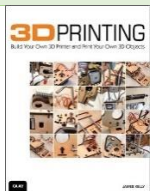


Even if you've never touched a 3D printer, these projects will excite and empower you to learn new skills, extend your current abilities, and awaken your creative impulses. Each project uses a unique combination of electronics, hand assembly techniques, custom 3D-printed parts, and software, while teaching you how to think through and execute your own ideas.

Written by the founder of Printrbot, his staff, and veteran DIY authors, this book of projects exemplifies the broad range of highly personalized, limit-pushing project possibilities of 3D printing when combined with affordable electronic components and materials.

In *Make: 3D Printing Projects*, you'll: *Print and assemble a modular lamp that's suitable for beginners--and quickly gets you incorporating electronics into 3D-printed structures. *Learn about RC vehicles by fabricating--and driving--your own sleek, shiny, and fast Inverted Trike. *Model a 1950s-style Raygun Pen through a step-by-step primer on how to augment an existing object through rapid prototyping. *Fabricate a fully functional, battery-powered screwdriver, while learning how to tear down and reconstruct your own tools. *Get hands-on with animatronics by building your own set of life-like mechanical eyes. *Make a Raspberry Pi robot that rides a monorail of string, can turn corners, runs its own web server, streams video, and is remote-controlled from your phone. *Build and customize a bubble-blowing robot, flower watering contraption, and a DIY camera gimbal.

3D Printing: Build Your Own 3D Printer and Print Your Own 3D Objects	Kelly, James Floyd	621.9 KEL
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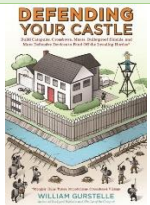
Right now, you can print practically any 3D object you can imagine—from toys to gadgets to replacement parts, and beyond! All you need is a 3D printer...and they're simpler and cheaper than you ever imagined. This full-color, step-by-step guide will get you started—and if you want, it'll even walk you through building your own 3D printer from an inexpensive kit.

Packed with colorful photos and screenshots, it explains all the crucial details other books skip. You'll walk through choosing and assembling your new 3D printer kit...brainstorming and designing new objects with free software...and then printing them on your brand-new 3D printer.

3D printing is today's hottest new technological revolution, and this book takes you right to the cutting edge!

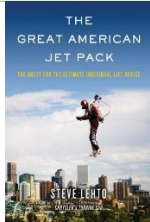
Discover how 3D printers work and what you can do with them: *Compare and choose your first 3D printer—either pre-built or kit *Assemble Printrbot Simple, one of the world's easiest 3D printer kits *Install and configure software that tells your 3D printer what to do *Print your first 3D project from an existing object file *Use free Tinkercad software to create your own original 3D models *Explore AutoDesk's free software for 3D printing *Use Print-It-For-You services for projects your home printer can't handle *Find great 3D printing projects and models on the Web *Imagine creative new uses for your 3D printer

Defending Your Castle: Build Catapults, Crossbows, Moats, Bulletproof Shields, and More Defensive Devices to Fend off the Invading Hordes	Gurstelle, William	623.4 GUR
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A man's home is his castle, or so the saying goes, but could it withstand an attack by Attila and the Huns, Ragnar and the Vikings, Alexander and the Greeks, Genghis Khan and the Mongols, or Tamerlane and the Tartars? Backyard Ballistics author William Gurstelle poses this fascinating question to modern-day garage warriors and shows them how to build an arsenal of ancient artillery and fortifications aimed at withstanding these invading hordes. Each chapter introduces a new bad actor in the history of warfare, details his conquests, and features weapons and fortifications to defend against him and his minions. Clear step-by-step instructions, diagrams, and photographs show how to build a dozen projects, including "Da Vinci's Catapult," "Carpini's Crossbow," a "Crusader-Proof Moat," "Alexander's Tortoise," and the "Cheval-de-frise." With a strong emphasis on safety, the book also gives tips on troubleshooting, explains the physics behind many of the projects, and shows where to buy the materials. By the time they've reached the last page, at-home defenders everywhere will have succeeded in creating a fully fortified home.

The Great American Jet Pack: The Quest for the Ultimate Individual Lift Device	Lehto, Steve	629.1 LEH
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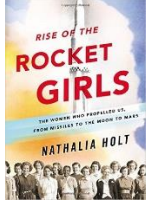
Tracing the remarkable history of a certain kind of flying machine—from the rocket belt to the jet belt to the flying platform and all the way to Yves Rossy's 21st-century free flights using a jet-powered wing—this historical account delves into the technology that made these devices possible and the reasons why they never became commercial successes on a mass scale. These individual lift devices, as they were blandly labeled by the government men who financed much of their development, answered man's desire to simply step outside and take flight. No runways, no wings, no pilot's license were required. But the history of the jet pack did not follow its expected trajectory and the devices that were thought to become as commonplace as cars have instead become one of the most overpromised technologies of all time. This fascinating account profiles the inventors and pilots, the hucksters and cheats, and the businessmen and soldiers who were involved with the machines, and it tells a great American story of a technology whose promise may yet, one day, come to fruition.

Flight: The Evolution of Aviation	Woolford, Stephen & Warner, Carl	629.13 WOO
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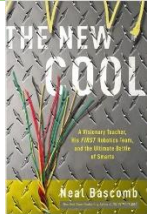
The Wright Brothers first took their flyer soaring in 1903—and less than a century later, rockets flew us to the moon. Experience the evolution of aviation, from the earliest pioneers to the complex technology of military jets and beyond, as inventors and aviators with skill and imagination push the limits of possibility. A rich selection of photos includes images of groundbreaking designs, patents, and logbooks from record-breaking flights.

Rise of the Rocket Girls: The Women Who Propelled Us, From Missile to the Moon to Mars	Holt, Nathalia	629.4 HOL
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The riveting true story of the women who launched America into space. In the 1940s and 50s, when the newly minted Jet Propulsion Laboratory needed quick-thinking mathematicians to calculate velocities and plot trajectories, they didn't turn to male graduates. Rather, they recruited an elite group of young women who, with only pencil, paper, and mathematical prowess, transformed rocket design, helped bring about the first American satellites, and made the exploration of the solar system possible. For the first time, *Rise of the Rocket Girls* tells the stories of these women--known as "human computers"--who broke the boundaries of both gender and science. Based on extensive research and interviews with all the living members of the team, *Rise of the Rocket Girls* offers a unique perspective on the role of women in science: both where we've been, and the far reaches of space to which we're heading.

The New Cool: A Visionary Teacher, His First Robotics Team, and the Ultimate Battle of Smarts	Bascomb, Neal	629.8 BAS
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That Monday afternoon, in high-school gyms across America, kids were battling for the only glory American culture seems to want to dispense to the young these days: *sports* glory. But at Dos Pueblos High School in Goleta, California, in a gear-cluttered classroom, a different type of "cool" was brewing. A physics teacher with a dream – the first public high-school teacher ever to win a MacArthur Genius Award -- had rounded up a band of high-I.Q. students who wanted to put their technical know-how to work. If you asked these brainiacs what the stakes were that first week of their project, they'd have told you it was all about winning a robotics competition – building the ultimate robot and prevailing in a machine-to-machine contest in front of 25,000 screaming fans at Atlanta's Georgia Dome.

But for their mentor, Amir Abo-Shaer, much more hung in the balance.

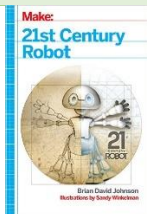
The fact was, Amir had in mind a different vision for education, one based not on rote learning -- on absorbing facts and figures -- but on active *creation*. In his mind's eye, he saw an even more robust academy within Dos Pueblos that would make science, technology, engineering, and math (STEM) *cool* again, and he knew he was poised on the edge of making that dream a reality. All he needed to get the necessary funding was one flashy win – a triumph that would firmly put his Engineering Academy at Dos Pueblos on the map. He imagined that one day there would be a nation *filled* with such academies, and a new popular veneration for STEM – a "new cool" – that would return America to its former innovative glory.

It was a dream shared by Dean Kamen, a modern-day inventing wizard – often-called "the Edison of his time" – who'd concocted the very same *FIRST* Robotics Competition that had lured the kids at Dos Pueblos. Kamen had created *FIRST* (For Inspiration and Recognition of Science and Technology) nearly twenty years prior. And now, with a participant alumni base approaching a million strong, he felt that awareness was about to hit critical mass.

But before the Dos Pueblos D'Penguineers could do their part in bringing a new cool to America, they'd have to vanquish an intimidating lineup of "super-teams"– high-school technology goliaths that hailed from engineering hot spots such as Silicon Valley, Massachusetts' Route 128 technology corridor, and Michigan's auto-design belt. Some of these teams were so good that winning wasn't just hoped for every year, it was expected.

In *The New Cool*, Neal Bascomb manages to make even those who know little about – or are vaguely suspicious of – technology care passionately about a team of kids questing after a different kind of glory. In these kids' heartaches and headaches – and yes, high-five triumphs -- we glimpse the path not just to a new way of educating our youth but of honoring the crucial skills a society needs to prosper. A *new cool*.

Make: 21st Century Robot	Johnson, Brian David	629.8 JOH
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When companies develop a new technology, do they ask how it might affect the people who will actually use it? That, more or less, sums up Brian David Johnson's duties as Intel's futurist-in-residence. In this fascinating book, Johnson provides a collection of science fiction prototyping stories that attempt to answer the question.

These stories focus on the same theme: scientists and thinkers exploring personal robotics as a new form of artificial intelligence. This isn't fanciful speculation. Johnson's stories are based on Intel's futurecasting research, which uses ethnographic field studies, technology research, trend data, and science fiction to develop a pragmatic vision of consumers and computing. *21st Century Robot* presents science fiction designed to bring about science fact.

Get real insight into technology and the future with this book. It will open your eyes.

Our Robots, Ourselves: Robotics and the Myths of Autonomy	Mindell, David A.	629.8 MIN
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From drones to Mars rovers—an exploration of the most innovative use of robots today and a provocative argument for the crucial role of humans in our increasingly technological future.

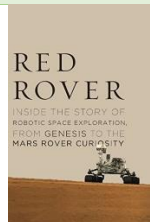
In *Our Robots, Ourselves*, David Mindell offers a fascinating behind-the-scenes look at the cutting edge of robotics today, debunking commonly held myths and exploring the rapidly changing relationships between humans and machines.

Drawing on firsthand experience, extensive interviews, and the latest research from MIT and elsewhere, Mindell takes us to extreme environments—high atmosphere, deep ocean, and outer space—to reveal where the most advanced robotics already exist. In these environments, scientists use robots to discover new information about ancient civilizations, to map some of the world's largest geological features, and even to "commute" to Mars to conduct daily experiments. But these tools of air, sea, and

space also forecast the dangers, ethical quandaries, and unintended consequences of a future in which robotics and automation suffuse our everyday lives.

Mindell argues that the stark lines we've drawn between human and not human, manual and automated, aren't helpful for understanding our relationship with robotics. Brilliantly researched and accessibly written, *Our Robots, Ourselves* clarifies misconceptions about the autonomous robot, offering instead a hopeful message about what he calls "rich human presence" at the center of the technological landscape we are now creating.

Red Rover: Inside the Story of Robotic Space Exploration, from Genesis to the Mars Rover Curiosity	Wiens, Roger	629.8 WIE
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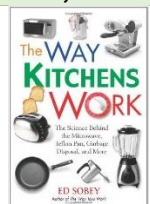
For centuries humankind has fantasized about life on Mars, whether it's intelligent Martian life invading our planet (immortalized in H.G. Wells's *The War of the Worlds*) or humanity colonizing Mars (the late Ray Bradbury's *The Martian Chronicles*). The Red Planet's proximity and likeness to Earth make it a magnet for our collective imagination. Yet the question of whether life exists on Mars—or has ever existed there—remains an open one. Science has not caught up to science fiction—at least not yet.

This summer we will be one step closer to finding the answer. On August 5th, Curiosity—a one-ton, Mini Cooper-sized nuclear-powered rover—is scheduled to land on Mars, with the primary mission of determining whether the red planet has ever been physically capable of supporting life. In *Getting to Mars*, Roger Wiens, the principal investigator for the ChemCam instrument on the rover—the main tool for measuring Mars's past habitability—will tell the unlikely story of the development of this payload and rover now blasting towards a planet 354 million miles from Earth.

ChemCam (short for Chemistry and Camera) is an instrument onboard the Curiosity designed to vaporize and measure the chemical makeup of Martian rocks. Different elements give off uniquely colored light when zapped with a laser; the light is then read by the instrument's spectrometer and identified. The idea is to use ChemCam to detect life-supporting elements such as carbon, nitrogen, and oxygen to evaluate whether conditions on Mars have ever been favorable for microbial life.

This is not only an inside story about sending fantastic lasers to Mars, however. It's the story of a new era in space exploration. Starting with NASA's introduction of the Discovery Program in 1992, smaller, scrappier, more nimble missions won out as behemoth manned projects went extinct. This strategic shift presented huge opportunities—but also presented huge risks for shutdown and failure. And as Wiens recounts, his project came close to being closed down on numerous occasions. *Getting to Mars* is the inspiring account of how Wiens and his team overcame incredible challenges—logistical, financial, and political—to successfully launch a rover in an effort to answer the eternal question: is there life on Mars?

The Way Kitchens Work: The Science Behind the Microwave, Teflon Pan, Garbage Disposal, and More	Sobey, Ed	643.3 SOB
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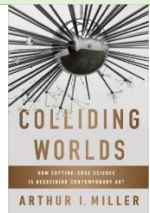


If you've ever wondered how a microwave heats food, or why aluminum foil is shiny on one side and dull on the other, or whether it is better to use cold or hot water in a garbage disposal, you should read *The Way Kitchens Work*. Modern kitchens are hi-tech marvels, with more machinery than any other room in the house. Each of the 50+ entries includes its history, interesting trivia, and a discussion of the technology involved.

Readers will also enjoy reviewing the utensils' and appliances' original patent blueprints, as well as photos of the "guts" of these culinary tools. The author even includes odd side stories, such as how the waffle iron played a role in the founding of Nike, how you can reset a turkey timer, and why socialite Josephine Cochran *really* invented the dishwasher in 1886—it wasn't because she wanted to ease the burden of her servants, but because she wanted a device that would avoid the unsightly chips associated with hand washing.

And finally, for those whose stovetop skills are still in development, Sobey provides information on the invention and use of the smoke detector and hand-held fire extinguisher.

Colliding Worlds: How Cutting-Edge Science Is Redefining Contemporary Art	Miller, Arthur I.	700.1 MIL
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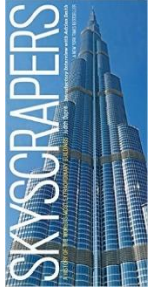
A dazzling look at the artists working on the frontiers of science.

In recent decades, an exciting new art movement has emerged in which artists utilize and illuminate the latest advances in science. Some of their provocative creations—a live rabbit implanted with the fluorescent gene of a jellyfish, a gigantic glass-and-chrome sculpture of the Big Bang (pictured on the cover)—can be seen in traditional art museums and magazines, while others are being made by leading designers at Pixar, Google's Creative Lab, and the MIT Media Lab. In *Colliding Worlds*, Arthur I. Miller takes readers on a wild journey to explore this new frontier.

Miller, the author of *Einstein*, *Picasso* and other celebrated books on science and creativity, traces the movement from its seeds a century ago—when Einstein's theory of relativity helped shape the thinking of the Cubists—to its flowering today.

Through interviews with innovative thinkers and artists across disciplines, Miller shows with verve and clarity how discoveries in biotechnology, cosmology, quantum physics, and beyond are animating the work of designers like Neri Oxman, musicians like David Toop, and the artists-in-residence at CERN's Large Hadron Collider.

Skyscrapers: A History of the World's Most Extraordinary Buildings	Dupre, Judith	720.483 DUP
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Unique in scale and design, *Skyscrapers* explores in-depth more than 60 buildings, including One World Trade Center, Burj Dubai, the Shanghai World Financial Center, the Petronas Towers, the Tribune Tower, the Lipstick Building, and the Phare Tower. This completely revised and full-color edition presents 10 new buildings, among them The Shard in London (2012, Renzo Piano), the International Commerce Centre in Hong Kong (2010, Kohn Pedersen Fox), the Shanghai Tower (2014, Gensler Architects), and the Kingdom Tower in Jeddah (2018, Adrian Smith), which will be the tallest building in the world when completed.

Arranged chronologically by date of building construction, each informative spread has photos of the featured building from various angles, building plans, diagrams, the building's historical background, and technological information.

Skyscrapers also offers additional information on such topics as the ancient roots of skyscrapers and visionary cities of the future, as well as a fascinating interview with Philip Johnson, together with other profiles. New topics include the era of the megatall building, the building of a skyscraper, and the explosive growth of skyscrapers in Dubai and China.

Great Design: The World's Best Design Explored & Explained	Wilkinson, Philip	745.2 WIL
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Featuring DK's signature lush, visual style, *Great Design* provides a fascinating overview of the dynamic history of design from the 1860s onwards. It traces the development of modern design from all corners of the world, including product design, furniture, graphics, industrial design, and textiles.

With more than 100 of the best designs explored and explained, from Bauhaus posters and bubble chairs to the Citroën DS and the iPad, *Great Design* is a stunning visual guide to the icons of modern design.

Including profiles of influential designers, workshops, and movements, as well as highlighting the key characteristic elements, reading *Great Design* is like being taken on a tour of a design museum with a personal guide who points out what to look at, deciphers key points of style, and helps you understand what design is and how it works.

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