

Physics Resource List for Grades K through 4

The resources in this section can be used with the Physics Curriculum Packet for grades K through 4.

Books

Nonfiction and Biography

- All About Stephen Hawking, 2018 by Chris Edwards (Author), Amber Calderon (Illustrator).
This is about the life of Stephen Hawking, who made cosmology, or the study of the universe, accessible to everyone.
- Gravity, 2014 by Jason Chin (Author, Illustrator).
The author has taken a complex subject and made it accessible to young readers in this unusual, innovative, and beautiful book.
- How Machines Work: Zoo Break! 2015 by David Macaulay (Author)
Complete with a unique jacket with an interactive compound machine incorporating several of the simple mechanisms featured in the book, this book uses models and illustrations (and sloths!) to demonstrate the technology of six simple machines: levers, pulleys, screws, inclined planes, wedges, and wheels.
- Isaac Newton and Physics for Kids: His Life and Ideas with 21 Activities, 2009 by Kerrie Logan Hollihan (Author).
This book gives us a good look at this brilliant and complex man, including 21 hands-on projects that explore the scientific concepts Newton developed.
- The Kids' Book of Simple Machines: Cool Projects & Activities that Make Science Fun! 2015 by Kelly Doudna (Author).
Learning about the six simple machines can be fun. Through exciting science projects and activities kids can easily do at home or school, tomorrow's scientists and engineers will have a blast learning about simple machines and how they make daily life easier.
- Magnets Push, Magnets Pull, 2017 by David A. Adler (Author), Anna Raff (Illustrator).
This title covers the basics of magnetism. Terms such as attraction, pole, electromagnetism and force are plainly explained.
- Marie Curie (Little People, Big Dreams), 2017 by Isabel Sanchez Vegara (Author), Frau Isa (Illustrator).
The book features Marie Curie, whose love of learning helped her to revolutionize the fight against cancer with her discovery of radium and polonium. This biography comes with extra facts about Marie's life at the back.

- Odd Boy Out: Young Albert Einstein, 2008 by Don Brown (Author).
Albert Einstein's ideas were destined to change the way we know and understand the world and our place in the universe.
- STEM Starters for Kids Physics Activity Book: Packed with activities and physics facts, 2018 by Jacoby (Author), Barker (Illustrator).
The acronym "STEM" stands for (S)cience, (T)echnology, (E)ngineering, and (M)ath. This book aims to interest children in these areas of study.
- What Does A Wheel Do? (How? What? Why), 2002 by Jim Pipe (Author).
Explains the way a few simple things work using puzzles and demonstrations.
- Women in Physics | A Science Book for Kids! 2017 by Mary Wissinger (Author) and Danielle Pioli (Illustrator).
Concepts covered in this book include: Matter, Mass, Force, Gravity, Atoms, Elements, X-rays, Radioactivity, Observation, Research, Hypotheses, Experiments, ...and more! Scientists profiled include Emilie du Chatelet, Laura Bassi, Marie Curie, Irene Joliot-Curie, and Chien-Shiung Wu.

Fiction

- George's Secret Key to the Universe, 2009 by Stephen Hawking (Author), Lucy Hawking (Author), Garry Parsons (Illustrator).
Famous physicist Stephen Hawking and his daughter, Lucy, provide a great adventure that explains fascinating information about our universe, including Dr. Hawking's latest ideas about black holes. (Series)
- Mahalia Mouse Goes to College, 2007 by John Lithgow (Author), Igor Oleynikov (Illustrator).
Sent by her parents to find food, Mahalia Mouse finds herself trapped in a backpack and transported to a physics classroom at Harvard University, where she discovers an aptitude for science.
- Newton and Me, 2013 by Lynne Mayer (Author), Sherry Rogers (Illustrator).
While at play with his dog, Newton, a young boy discovers the laws of force and motion in everyday activities such as throwing a ball, pulling a wagon, and riding a bike.
- On a Beam of Light: A Story of Albert Einstein, 2016 by Jennifer Berne (Author), Vladimir Radunsky (Illustrator).
Parents and children alike will appreciate this moving story of the powerful difference imagination can make in any life.
- Professor Astro Cat's Atomic Adventure, 2016 by Dr. Dominic Walliman (Author), Ben Newman (Illustrator).
This adventurous feline will take you on a journey through the incredible world of physics. Learn about energy, power and the building blocks of you, me and the universe.
- Roller Coaster, 2006 by Marla Frazee (Author).
Get ready to experience the thrill of riding a coaster for the very first time in this vibrant new adventure.

- Splat! Wile E. Coyote Experiments with States of Matter (Wile E. Coyote, Physical Science Genius), 2014 by Suzanne Slade (Author), Christian Cornia (Illustrator). Wile E. Coyote wants nothing more than to get hold of Road Runner. Watch as he uses liquids, solids, and gases in clever ways to catch that bird.

Magazines, Journals, Miscellaneous

- Crayon Physics Deluxe (purchased game). Highly rated and award-winning Innovative game that combines physics puzzles and drawing.
<http://www.crayonphysics.com/>
- Discover Magazine Online: Science and Physics (Requires online registration) <http://discovermagazine.com/topics/space-physics>
- Finger Physics (Download the app for Apple and Androids). Blocks move and react to stimuli as they would in the real world, and as kids play with them, they can see the laws of physics in action. *Finger Physics* is essentially a game and science experiment rolled into one.
- Science News for Students: Online magazine.
<https://www.sciencenewsforstudents.org/>
- Simple Machines by Tinybop: Excellent elementary NGSS engineering practices embedded in fun games. (Download the app for Apple and Androids).

Online Links

These sites have a rich array of resources, including background information, simulated experiences, and much more.

- Activities from the San Francisco Museum Exploratorium
<https://www.exploratorium.edu/explore/activities>
- Nasa Kids Club: a place to play games and learn about space.
<https://www.nasa.gov/kidsclub/index.html>
- Rader's Physics for Kids: Physics for everyone! <http://www.physics4kids.com/>
- Science Games: from PBS Kids <http://pbskids.org/games/science/>

For the Educator

- Lessons in Physics
http://teachengineering.org/search_results.php?simple=physics
Part of the Teach Engineering Web site, this section provides educators with fun and exciting lesson plans and activities to teach physics to elementary through high school students. Activities engage students of all ages in the science of physics.
- Physics Research Overview
<http://www.nsf.gov/news/overviews/physics/index.jsp>
Physics begins with the everyday physical world around us and goes on to give us many answers--along with a rich and detailed account of things like force, motion, gravity, heat, light, electricity and magnetism--that actually give rise to the everyday world. This

overview page on the National Science Foundation's Web site provides insight through funded research that everyone can benefit from.

- STEAM Kids: 50+ Science/Technology/Engineering/Art/Math Hands-On Projects for Kids, 2016 by Anne Carey (Author), Ana Dziengel (Contributor), Amber Scardino (Contributor), & 8 more.

A year's worth of captivating STEAM (Science, Technology, Engineering, Art & Math) activities. Created by an MIT engineer, award winning educators, designers, and homeschooling experts, STEAM Kids will inspire your children to: question like a scientist, design like a technologist, build like an engineer, create like an artist, and deduce like a mathematician. Bonus materials will make things easy for parents and educators, and include: a handy weekly planning guide, project shopping lists, STEAM journal and more. So, gather up your curious kids and get your STEAM on!

- We Are Teachers Lesson Plans

<https://www.weareteachers.com/simple-physics-experiments-for-kids-pushing-and-pulling/>

Simple Experiments to Introduce Kids to Physics. It is never too early to start having fun with Physics!

Physics

Resource List for Grades 5 through 8

The resources in this section can be used with the Physics Curriculum Packet for grades 5 through 8.

Books

Nonfiction and Biography

- [Albert Einstein \(Giants of Science\), 2015 by Kathleen Krull \(Author\), Boris Kulikov \(Illustrator\).](#)
Einstein's wild case of bedhead and playful sense of humor made him the first scientist-celebrity. He didn't like the lab, but he did like to blow things up! This is a witty and fun look at a giant of science and the turbulent times in which he lived
- [Albert Einstein and Relativity for Kids: His Life and Ideas with 21 Activities and Thought Experiments, 2012 by Jerome Pohlen \(Author\).](#)
In addition to learning all about Einstein's important contributions to science, from proving the existence and size of atoms and launching the field of quantum mechanics to creating models of the universe that led to the discovery of black holes and the big bang theory, young physicists will participate in activities and thought experiments to bring his theories and ideas to life.
- [Janice VanCleave's Physics for Every Kid: 101 Easy Experiments in Motion, Heat, Light, Machines, and Sound, 1991 by Janice VanCleave \(Author\).](#)
Fun projects in this book include learning about gravity from funnels that seem to defy nature by rolling up hill, using a balloon as a power source to make a fluorescent light bulb glow and learn how electrons are used to produce light, and levitating a Ping-Pong ball to understand aerodynamics.
- [Science Quest: Atomic Universe: The Quest to Discover Radioactivity, 2006 by Kate Boehm Jerome \(Author\).](#)
Today radioactivity is widely used to treat cancer, to study fossils, and to power submarines, but until the late 1800s man's understanding of this scientific field was practically non-existent.
- [Sports \(Experimenting with Everyday Science\), 2010 by Stephen M. Tomecek \(Author\).](#)
An intriguing look at sports through physics and other sciences.
- [Women in Physics | A Science Book for Kids! 2017 by Mary Wissinger \(Author\) and Danielle Pioli \(Illustrator\).](#)
Concepts covered in this book include: Matter, Mass, Force, Gravity, Atoms, Elements, X-rays, Radioactivity, Observation, Research, Hypotheses, Experiments, ...and more!
Scientists profiled include Emilie du Chatelet, Laura Bassi, Marie Curie, Irene Joliot-Curie, and Chien-Shiung Wu.
- [World History Biographies: Isaac Newton: The Scientist Who Changed Everything, 2013 by Philip Steele \(Author\).](#)
This biography profiles the famed physicist as an acclaimed mathematician, astronomer, alchemist, philosopher, and inventor as well.

Fiction

- The Gates (The Samuel Johnson Series), 2011 by John Connolly (Author)
The Gates is about the pull between good and evil, physics and fantasy and the courage of a boy who is barely old enough to trick or treat on his own. First in a series of three.
- Max Axiom: Graphic Novel Series on Physics
 - Adventures in Sound with Max Axiom, Super Scientist, 2007 by Emily Sohn (Author), Anne Timmons (Author), Cynthia Martin (Illustrator).
 - The Attractive Story of Magnetism with Max Axiom, Super Scientist, 2008 by Andrea Gianopoulos (Author), Barbara Schulz (Author), Cynthia Martin (Illustrator).
 - The Shocking World of Electricity with Max Axiom, Super Scientist, 2007 by Liam O'Donnell (Author), Charles Barnett III (Author), Richard Dominguez (Illustrator).
 - A Crash Course in Forces and Motion with Max Axiom, Super Scientist, 2016 by Emily Sohn (Author), Charles Barnett III (Author), Steve Erwin (Illustrator).
 - The Solid Truth about States of Matter with Max Axiom, Super Scientist, 2009 by Agnieszka Biskup (Author), Michael Kelleher (Author), Cynthia Martin (Illustrator), & 1 more.
 - The Powerful World of Energy with Max Axiom, Super Scientist (Graphic Science), 2009 by Agnieszka Biskup (Author), Krista Ward (Author), Cynthia Martin (Illustrator), & 1 more.

Magazines, Journals, Miscellaneous

- Algodoo: Sandbox tool enables engaged, conceptual physics inquiry. (For Mac and Windows).
- Discover Magazine Online: Science and Physics (Requires online registration) <http://discovermagazine.com/topics/space-physics>
- Science News for Students: Online magazine. <https://www.sciencenewsforstudents.org/>
- Science Journal by Google: Science journal by google is a tool for gathering data using a cell phone, tablet, or Chromebook. Students start an "experiment" and fill it with virtual cards containing different types of information. They can have an observation, which is an open-ended text-based card, and can take pictures with the device and add those (Download the app for Apple and Androids).
- Contraption Maker: Solve problems, puzzles, brain teasers while creating wacky machines. (For Mac and Windows).

Online Links

- Activities from the San Francisco Museum Exploratorium
<https://www.exploratorium.edu/explore/activities>
- Nasa Kids Club: a place to play games and learn about space.
<https://www.nasa.gov/kidsclub/index.html>

- Rader's Physics for Kids: Physics for everyone! <http://www.physics4kids.com/>

Background information for the Educator

- Lessons in Physics
http://teachengineering.org/search_results.php?simple=physics
Part of the Teach Engineering Web site, this section provides educators with fun and exciting lesson plans and activities to teach physics to elementary through high school students. Activities engage students of all ages in the science of physics.
- Physics Research Overview
<http://www.nsf.gov/news/overviews/physics/index.jsp>
Physics begins with the everyday physical world around us and goes on to give us many answers--along with a rich and detailed account of things like force, motion, gravity, heat, light, electricity and magnetism--that actually give rise to the everyday world. This overview page on the National Science Foundation's Web site provides insight through funded research that everyone can benefit from.
- We Are Teachers Lesson Plans
<https://www.weareteachers.com/simple-physics-experiments-for-kids-pushing-and-pulling/>
Simple Experiments to Introduce Kids to Physics. It is never too early to start having fun with Physics!

Physics

Resource List for Grades 9 through 12

The resources in this section can be used with the Physics Curriculum Packet for grades 9 through 12.

Books

Non-fiction and Biography

- [A Career in Transportation and Warehousing \(Jobs for Rebuilding America\)](#), 2018 by Joe Greek (Author).
From seeing the country from behind the wheel of a truck to managing hundreds of workers at an e-commerce fulfillment center, career opportunities within transportation and warehousing are booming in the United States. This book introduces students to a variety of job and career paths in logistics with ample room for growth, including how to jumpstart their journeys as early as high school.
- [Civil Engineering: A Very Short Introduction](#), 2012 by David Muir Wood (Author).
Civil engineering has made an inestimable contribution to modern life, providing the crucial expertise behind our vast transportation systems and the wide array of built structures where we work, study, and play. In this title, the author turns a spotlight on a field that we often take for granted.
- [Cutting Edge Transportation Technology \(Cutting Edge Technology\)](#), 2016 by Barbara Sheen (Author).
Looks at the latest innovations in transportation technology, including electric vehicles, self-driving cars, high-speed trains, hydrogen- and wind-powered marine vehicles, drones, and the possibility of space tourism and colonization.
- [Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future](#), 2015 by Ashlee Vance (Author). 9-12
This book traces the entrepreneur's journey from a rough upbringing in South Africa to the pinnacle of the global business world. A modern alloy of Thomas Edison, Henry Ford, Howard Hughes, and Steve Jobs, Musk is the man behind PayPal, Tesla Motors, SpaceX, and SolarCity, each of which has sent shock waves throughout American business and industry.
- [Getting There: Frontier Travel Without Power](#), 1980 by Suzanne Hilton (Author).
Describes what it was like to travel by horseback, stagecoach, canal boat, flatboat, covered wagon, and sailing ship before the days of motorized travel.
- [The Great American Steamboat Race: The Natchez and the Robert E. Lee and the Climax of an Era](#), 2009 by Benton Rain Patterson (Author).
Running from New Orleans to St. Louis in the summer of 1870, the race between the Robert E. Lee and the Natchez remains the world's most famous steamboat race. This book tells the story of the dramatic contest, which was won by the stripped-down, cargoless Robert E. Lee after three days, 18 hours, and 14 minutes of steaming through day, night and fog.
- [Rebuilding America's Infrastructure \(In the News\)](#), 2010 by Annalise Silivanch (Author).
Discusses the need to rebuild America's infrastructure in the fields of transportation,

energy, water, and waste, and discusses the environmental and economic challenges to renovating the infrastructure.

- Shackleton's Stowaway, 2006 by Victoria McKernan (Author).
On October 26, 1914, Ernest Shackleton's Endurance set sail from Buenos Aires in pursuit of the last unclaimed prize in exploration: the crossing of the Antarctic continent. The crew stood on deck to watch the city fade away. All but one. Eighteen-year-old Perce Blackborow hid below in a locker. But the thrill of stowing away with the legendary explorer would soon turn to fear. Within months, the Endurance, trapped and crushed by ice, sank.
- Wheels of Change: How Women Rode the Bicycle to Freedom (With a Few Flat Tires Along the Way), 2017 by Sue Macy (Author).
Take a lively look at women's history from aboard a bicycle, which granted females the freedom of mobility and helped empower women's liberation. Through vintage photographs, advertisements, cartoons, and songs, *Wheels of Change* transports young readers to bygone eras to see how women used the bicycle to improve their lives.

Fiction

- Airman, 2009 by Eoin Colfer (Author).
Conor Broekhart was born to fly. It is the 1890s, and Conor and his family live on the sovereign Saltee Islands, off the Irish coast. Conor spends his days studying the science of flight with his tutor and exploring the castle with the king's daughter, Princess Isabella. But the boy's idyllic life changes forever the day he discovers a deadly conspiracy against the king.
- The Car, 2006 by Gary Paulsen (Author).
Neglected by his parents, fourteen-year-old Terry Anders is used to taking care of things on his own. He even manages to assemble a car kit by himself. When the car is finished, Terry sets off from Cleveland to Portland in search of an uncle he barely remembers. Along the way, he is joined by a wise Vietnam vet who turns his journey into an adventure in learning.
- The Mystery of the Blue Train: A Hercule Poirot Mystery (Hercule Poirot Mysteries), 2011 by Agatha Christie (Author).
When the luxurious Blue Train arrives at Nice, a guard attempts to wake serene Ruth Kettering from her slumbers. But she will never wake again, for a heavy blow has killed her, disfiguring her features almost beyond recognition. What is more, her precious rubies are missing.
- Secrets (The Steamship Chronicles), 2014 by Margaret McGaffey Fisk (Author).
Samantha reads the hearts of mechanical devices and transforms them into what they long to be. In a steam-powered Victorian England where only the wealthy can afford such contraptions, the law does not look kindly on Naturals who destroy these purchases. Barely able to resist the demand of the devices, Sam becomes a danger to everyone around her, not in the least because the mechanicals show little restraint once changed.
- The Ship Beyond Time (Girl from Everywhere), 2018 by Heidi Heilig (Author).
Nix has spent her whole life journeying to places both real and imagined aboard her time-traveling father's ship. And now it's finally time for her to take the helm. Her future lies bright before her, until she learns that she is destined to lose the one she loves.

- The Swiss Family Robinson, 2016 by Johann David Wyss (Author), Charles Nodier (Introduction).
First published in 1812, Johann David Wyss's "The Swiss Family Robinson" is a classic story of survival on a deserted tropical island. While en route to Australia, the family finds themselves in great peril when their vessel is caught in a violent storm. As the ship breaks apart when it is battered against a reef, the family is abandoned by their crew, who escape without them in the lifeboats.
- Wheels of Change, 2014 by Darlene Beck Jacobson (Author).
In 1908 Washington D.C., twelve-year-old Emily Soper watches her father's business have trouble when automobiles cut into his fine carriage business.

Magazines, Journals, Miscellaneous

- Car And Driver: Car and Driver offers down-to-earth advice and useful reviews on the automobiles that most people own and drive today.
<https://www.hearst.com/magazines/car-and-driver>
- Discover Magazine: Transportation
<http://discovermagazine.com/tags/transportation>
- Road and Track Online
<https://www.roadandtrack.com>
- SimplePlanes: Minimalist flight simulator lets you build (and crash) your own plane.
Download in your play store

Online Links

- The National Museum of American History: Explore the collections containing photographs and historical facts about transportation.
<http://americanhistory.si.edu/collections/subjects/transportation>
- National Transportation Museum: Virtual tour
<http://tours.aspiremedia360.com/44237>
- The Smithsonian: Trains at Smithsonian Station
<https://www.si.edu/spotlight/trains>

Background information for the Educator

- Nanosonic: Lessons using advanced transportation systems as a central theme.
<http://www.nanosonic.com/education/>
- Transportation Teaching Ideas
<https://educators.brainpop>