

## Engineering Resource List for Grades K through 4

The Resources in this document can be used with the Engineering Curriculum Packet for grades K through 4.

### Books

#### Non-fiction and Biography

- Aerospace Engineer Aprille Ericsson, 2015 by Laura Hamilton Waxman (Author). Biography Ericsson was one of the few girls in her middle school who loved math and science. Years later, she became the first woman to receive a PhD in mechanical engineering from Howard University. At NASA, she's helped build spacecraft that can map the moon, monitor climate change, or even bring soil and rocks back from Mars
- The Construction Alphabet Book, 2006 by Jerry Pallotta (Author), Rob Bolster (Illustrator). Find out about these construction machines and more, from a huge saw that cuts through roads to a massive vacuum that sucks up boulders. You'll even learn a quick and easy recipe for concrete. Rock crushers, jackhammers, and wrecking balls will delight the young readers.
- Cranes, Mighty Machines, 2010 by Amanda Askew (Author). Cranes are used for lifting almost any heavy load and moving it to a height. They are used to make buildings, bridges and ships. Some are used to stack containers onto ships, trains and trucks. A floating crane might be used for salvaging a sunken ship, and an aerial crane is a specially fitted helicopter that can rescue someone or drop emergency supplies into a disaster area.
- DK Readers: Big Machines, 2000 by Karen Wallace (Author). Crash! Scrape! Scrunch! A new park is being built. See big machines in action and find out what they do.
- Engineer It! Bridge Projects (Super Simple Engineering Projects), 2017 by Carolyn Bernhardt (Author). Readers will learn about different types of bridges with Engineer It! Bridge Projects. They will discover how bridges are built. Then, build their own suspension bridge, truss bridge, and more. Each project has color photos and easy-to-follow instructions.
- Engineer It! Canal Projects (Super Simple Engineering Projects), 2017 by Carolyn Bernhardt (Author). Readers will learn about different uses for canals with Engineer It! Canal Projects. They will discover how canals are built. Then, use clay, LEGOs, and more to build their own canals. Each project has color photos and easy-to-follow instructions.
- Engineer It! Road Projects (Super Simple Engineering Projects), 2017 by Carolyn Bernhardt (Author). Readers will learn about the history of roads with this book. They will discover how roads are built. Then, build their own cobblestone road, design a highway, and more. Each project has color photos and easy-to-follow instructions.

- Exploring Careers with Kids: ABCs of Civil Engineering, 2016 by Ben Willardson (Author). From Aqueduct to Zebra Mussel, the ABCs of Civil Engineering combines rhyming with stunning photography to start an adventure of exploring opportunities that never has to end. Introduce readers to the alphabet in a unique and exciting way while expanding your own understanding of the world around you.
- Goodnight, Goodnight Construction Site, 2011 by Sherri Duskey Rinker (Author), Tom Lichtenheld (Illustrator). As the sun sets behind the big construction site, all the hardworking trucks get ready to say goodnight. One by one, Crane Truck, Cement Mixer, Dump Truck, Bulldozer, and Excavator finish their work and lie down to rest, so they'll be ready for another day of rough and tough construction play!
- How a Bridge Is Built, 2016 by Sam Aloian (Author). Bridges are a big part of how people get from place to place. But how do they work and how are they built? In this book readers will explore these important engineering marvels that link places divided by water. Along the way they'll learn how to build their own model bridge with a step-by-step guide accompanied by full-color photographs of each step.
- How Emily Saved the Bridge: The Story of Emily Warren Roebling and the Building of the Brooklyn Bridge, 2019 by Frieda Wishinsky (Author), Natalie Nelson (Illustrator). Biography The Brooklyn Bridge, between Manhattan and Brooklyn, was completed in 1883. It is thanks to Emily Warren Roebling that the bridge was finished at all. Emily was educated in math and science. She married Washington Roebling, the chief engineer of the famous bridge. When Washington became ill from decompression sickness, Emily stepped in, doing everything to complete the bridge.
- Marvelous Mattie, 2006 by Emily Arnold McCully (Author). Biography With her sketchbook labeled My Inventions and her father's toolbox, Mattie could make almost anything. However, in court, a man claimed one of her invention was his, stating that she "could not possibly understand the mechanical complexities." Marvelous Mattie proved him wrong, and over the course of her life earned the title of "the Lady Edison."
- Mr. Ferris and His Wheel, 2014 by Kathryn Gibbs Davis (Author), Gilbert Ford (Illustrator). Capturing an engineer's creative vision and mind for detail, this picture book biography sheds light on how the American inventor George Ferris defied gravity and seemingly impossible odds to invent the world's most iconic amusement park attraction, the Ferris wheel.
- Neo Leo: The Ageless Ideas of Leonardo da Vinci, 2009 by Gene Barretta (Author, Illustrator). Biography Cleverly shows how Leonardo's ideas foreshadowed modern inventions. At once an artist, inventor, engineer, and scientist, Leonardo da Vinci wrote and drew detailed descriptions of what would later become hang gliders, automobiles, robots, and much more.
- Peeking Under the City (What's Beneath), 2016 by Esther Porter (Author), Andrés Lozano (Illustrator). A text with short sentences and not-too-challenging vocabulary takes readers on an underground tour to introduce civil-engineering technologies, from underground power cables and subways to church crypts and skyscraper foundations. Oriented sideways, the uncluttered spreads include helpful illustrations, diagrams, insets, cross-sections, and "Did You Know?" sidebars.
- Rosie Revere's Big Project Book for Bold Engineers, 2017 by Andrea Beaty (Author), David Roberts (Illustrator). This activity book features art from the picture book Rosie Revere, Engineer and will inspire

young readers with activities of all kinds. Kids will have the chance to design a better bicycle, build a simple catapult, construct a solar oven, and more.

- St. Louis Gateway Arch, 2015 by Keli Sipperley (Author).  
While reading the St. Louis Gateway Arch, students will learn about the significance of the landmark, which was made as a tribute for Thomas Jefferson and the pioneers of the American West.
- The Secret Subway, 2016 by Shana Corey (Author), Red Nose Studio (Illustrator).  
Way back in 1860, there were no subways, just cobblestone streets. Until Alfred Ely Beach had the idea for a fan-powered train that would travel underground in New York City. On February 26, 1870, after fifty-eight days of drilling and painting and plastering, Beach unveiled his masterpiece, and throngs of visitors took turns swooshing down the track.
- To the Top! A Gateway Arch Story, 2012 by Amanda E. Doyle (Author), Tony Waters (Editor).  
Tag along with 2 kids and their Grandpa as they explore the outside, inside, and very, very top of the Gateway Arch, on the Mississippi riverfront in St. Louis, Missouri. Together, the family discovers fascinating artifacts - a bison, a great grizzly bear, a statue of Thomas Jefferson, while Grandpa spins tales of his own memories, as a young man, of watching the Arch being built. More than just an architectural feat, the Arch embodies the history, culture, and spirit of westward expansion, exploration, and individual dignity.
- A Year at a Construction Site, 2009 by Nicholas Harris (Author).  
Outlines the steps construction workers take to build a school within a year's time.

## Fiction

- Anna, Kid Engineer, 2018 by Dr. Shenek Alston (Author).  
It was once again time for the annual Science Fair and Anna wasn't excited about the upcoming event because of the embarrassing projects she'd come up with during her 3rd and 4th grade years. This was her last year of elementary school, and she wanted this year to be different. Read more to find out if her 5th-grade science fair project turned out to be amazing, a flop, or somewhere in between!
- Marveltown, 2008 by Bruce McCall (Author).  
What's it like growing up in a town founded by inventors? On Saturdays, the adults open the doors of the Invent-o-Drome and give local children free rein to create whatever gadgets they can think up. Hypno-Goggles, a Rocket Chair, a homework eating robo-dog – the can-do kids of Marveltown are never at a loss for ideas.
- Min Makes a Machine (I Like to Read), 2018 by Emily Arnold McCully (Author).  
Min wants to play, but Ann and Bess say it's too hot. Using a pipe, a tube, and some glue, Min makes an Archimedes screw, a device that draws water, to get water from a well into a swimming pool
- The Most Magnificent Thing, 2014 by Ashley Spires (Author, Illustrator). A little girl has a wonderful idea. She is going to make the most MAGNIFICENT thing! But making her magnificent thing is anything but easy, and the girl tries and fails, repeatedly. Eventually, the girl gets really, mad. She is so mad, in fact, that she quits. But after her dog convinces her to take a walk, she comes back to her project with renewed enthusiasm and manages to get it just right.
- Rosie Revere, Engineer, 2013 by Andrea Beaty (Author), David Roberts (Illustrator).  
Rosie may seem quiet during the day, but at night she's a brilliant inventor of gizmos and gadgets who dreams of becoming a great engineer. When her Great-Great-Aunt Rose (Rosie the Riveter)

comes for a visit and mentions her one unfinished goal, to fly, Rosie sets to work building a contraption to make her aunt's dream come true.

### **Magazines, Journals, Miscellaneous**

- Bridges by Kids Discover  
The longest, widest, and tallest bridges in the world are featured in this issue, along with some elementary technical info for kids curious about how bridges are built. First, they'll learn about the three main types – beam, arch, and suspension — and how they work, and then they'll also check out some interesting variations, such as movable, seesaw, covered, and cable-stayed bridges. Following that, a comprehensive of history of bridges, for kids, highlights a 1,400-year-old Chinese one, as well as a Roman aqueduct dating from 19 B.C.  
<https://www.kidsdiscover.com/shop/issues/bridges-for-kids/>

### **Online Links**

- Discover Engineering: DiscoverE offers a growing number of hands-on activities, videos, and other resources that volunteers, parents, and students can use to explore engineering. The site also introduces national engineering outreach programs.  
<http://www.discovere.org/>
- eGFI - Engineering Go for It: The eGFI website offers information about engineering careers and how to pursue them, including profiles of engineering students and professionals. Teachers also can find lesson plans, hands-on activities, and professional development opportunities.  
<http://www.egfi-k12.org/>
- EngineerGirl: Designed by the National Academy of Engineering, this fun and informative site celebrates women in engineering and allows girls to explore what engineers do. It also offers resources to parents, teachers and mentors.  
<http://www.engineergirl.org/>

### **Background information for the Educator**

- National Center for Technological Literacy: The National Center for Technological Literacy (NCTL) is led by the Museum of Science, Boston. The site provides a vast amount of information for educators on workshops, professional development, curricula for grades K-12, and access to the Museum's Lyman Library.  
<http://www.nctl.org/>
- TeachEngineering: Engineers have a hand in designing, creating or modifying nearly everything around us. Find out more in this growing collection of 750+ free, teacher-tested, standards-based K-12 lessons and activities that engage students and enhance science and math learning using hands-on engineering.  
<http://www.teachengineering.org/>