**STEM & Literature**

STEM is a curriculum based on the idea of educating students in four specific disciplines — science, technology, engineering and mathematics — in an interdisciplinary and applied approach. STEM integrates the four disciplines into a cohesive learning paradigm based on real-world applications.

Teaching Resources Center, Joyner Library  
A Selective Annotated Bibliography

Titles in the Teaching Resources Center are cataloged with Dewey call numbers and are preceded by Curric. Please ask someone at the Teaching Resources Service Desk if you need any assistance.

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<tr>
<th>Lexile Score</th>
<th>Title Information</th>
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<td></td>
<td><strong>SCIENCE</strong></td>
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<td><strong>BIG BOOKS</strong></td>
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<td></td>
<td>This is a nonfiction, photo-illustrated Big book that introduces young children to the qualities of magnets.</td>
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<td>Introduces young children to the ever-changing world of science and about curiosity, asking questions, and exploring possible answers.</td>
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How do switches make fairgrounds fun? What makes a kite fly? Can sunlight bounce? How are echoes made? Discover the answers to these questions and more in these fantastic experiments that cover everything from making a burglar alarm to finding out how to split sunlight.

**EASY**


After winning the science fair with the giant robot she has built, a little girl realizes that there is a major problem.


Ada Twist is a very curious girl who shows perseverance by asking questions and performing experiments to find things out and understand the world.


When Jamar sees a newspaper ad for a kite-flying contest, he and his dad go to the library and find books on making and flying kites. Jamar knows he is now ready for the contest.


Tired of being covered in itchy mosquito bites, Riley uses science to investigate why mosquitoes are more attracted to him than to his friends.


Thea Teawinkle plants an odd, purple, bean-shaped seed in her backyard for her class science project, with astonishing results that even the experts she writes to—including a botanist, an arborist, a museum curator, and a symphony director—cannot offer any explanations for.


Tokyo lives in a small house between giant buildings with his family and his
cat, Kevin. For years, highways and skyscrapers have been built up around the family's house where once there were hills and trees. Will they ever experience the natural world again? One day, an old woman offers Tokyo seeds, telling him they will grow into whatever he wishes. Tokyo and his grandfather are astonished when the seeds grow into a forest so lush that it takes over the entire city overnight. Soon the whole city has gone wild, with animals roaming where cars once drove. But is this a problem to be surmounted, or a new way of living to be embraced?

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630L  

Stella and her brother Max, of the Brite and Brite Detective Agency, put the mystery of Mayor Pickle's missing Pekingese on hold as they join the astronomy club in researching the problem of invisible dark matter in the universe.

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700L  

In a series of letters, a boy, his science teacher, and his parents discuss the progress of a very unusual, sometimes frightening, plant that becomes more human as the summer progresses.

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AD850L  

When Grandpa, a traditional fisherman, is forced from his livelihood because increasingly efficient technology has depleted his island's supply of fish, he creates an ecologically sound solution by starting a sea moss farm.

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AD600L  

A boy and his dog learn about each other, go to school to learn more, then explore the world around them as they study science, geography and even foreign languages together.

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AD560L  

As the judging of his class's science fair approaches, Otis has trouble even thinking of an idea but once he has built a bird feeder he is determined to make some good observations, no matter how long it takes.

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NP  

When the teacher tells his class that they can hear the poetry of science in everything, a student is struck with a curse and begins hearing nothing...
but science verses that sound very much like some well-known poems.

## NONFICTION

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<thead>
<tr>
<th>Library</th>
<th>Author, Title &amp; Subtitle</th>
<th>Location</th>
<th>Call No.</th>
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<tbody>
<tr>
<td>N/A</td>
<td><strong>Bauer, Justin L.</strong> <em>What Every Science Student Should Know</em>. Chicago: The University of Chicago Press, 2016.</td>
<td>507.1</td>
<td>B3264W</td>
</tr>
<tr>
<td>What Every Science Student Should Know is the perfect personal mentor for any aspiring scientist, meant to help students avoid pitfalls while providing much-needed encouragement. It covers the entire college experience including choosing a major, mastering study skills, doing scientific research, finding a job, and most important, how to foster and keep a love of science.</td>
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<td>Asteroids come in all shapes and sizes--and hit our planet in them, too. But what happens if a catastrophically large one approaches earth? By looking on the ground at historical asteroid craters and present-day falls, and up into space for the big ones yet to come, a wide variety of scientists are trying to figure out how to track asteroids--and how to avoid devastating impacts in the future.</td>
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<tr>
<td>1160L</td>
<td><strong>Conkling, Winifred.</strong> <em>Radioactive! How Irene Curie &amp; Lisa Meitner Revolutionized Science and Changed the World</em>. Chapel Hill, NC: Algonquin Young Readers, 2016.</td>
<td>539.7</td>
<td>C7615R</td>
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<td>The ... little-known story of how two brilliant female physicists' groundbreaking discoveries led to the creation of the atomic bomb.</td>
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<td>Scientists seek to answer the critical question &quot;Can snowshoe hares and other animals that change their coat color each winter adapt to shorter winters caused by climate change?&quot;</td>
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<tr>
<td>N/A</td>
<td><strong>Schonberg, Monica.</strong> <em>I is for Idea: An Inventions Alphabet</em>. Chelsea, MI: Sleeping Bear Press, 2005.</td>
<td>600</td>
<td>SCH651I</td>
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<td>An A to Z introduction to modern inventions such as computers, microwave, umbrella, zipper and many more. Each invention is introduced with a poem and includes detailed-filled expository text.</td>
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**Science of the Lungs and Respiratory System**

Explores the human brain using simple flowcharts to break down difficult concepts into accessible chunks.

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Here is the story of the Apollo 11 mission to the Moon -- a story of leaving and returning during the summer of 1969, and a story of home, seen whole, from far away by steady astronauts in their great machines.

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<td>AD740L</td>
<td>McCarthy, Megan</td>
<td><em>Pop! The Accidental Invention of Bubble Gum</em></td>
<td>New York: Simon &amp; Schuster Books for Young Readers, 2010.</td>
<td>664.6 M1276P</td>
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With historical facts, the book tells the true story of how bubble gum was invented by Walter Diemer, who was an accountant at the Fleer Corporation, a factory in Philadelphia, in the late 1920s.

**TECHNOLOGY**

**EASY**

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Pages from the recently discovered diary of Captain Manuel J. Arsenio, in which are recorded his many failed attempts to create a flying machine, starting in the 1780s with the Motocanary, progressing through the Aerial Submarine, the Hamstertronic, and three other disasters.

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Penguin and his other flightless bird friends invent a flying machine, but they fly right into a thunderstorm.

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Henry finally finds a purpose for the "Incredible, Amazing Machine" that he built.

A young inventor accidentally creates a group of tiny robots that employ their unique abilities and teamwork to become incredibly useful—and maybe even change the world. Includes author's note on the science and uses of nano-robotics.


After frantically trying to stop his out of control robot from turning everything it touches into metal, Kyle finally listens to his little sister's advice.


Charlotte has a talent for anything technological, so when she receives a doll as a present, she upgrades it with a few spare parts and some code to create a new and improved friend.


Otto the robot builds a spaceship to take him home.


Dr. John Jeffries and his pilot, Jean-Pierre Blanchard, each want to be the first man to fly from one country to another, across the English Channel. There's only one problem: they can't stand each other! Inspired by the true story of the first international flight.


Inspired by a true story, when Queen Victoria is unable to go swimming without her subjects glimpsing her in a swimming suit, her husband, Prince Albert, comes up with an innovative solution so his wife can indulge in the healthy exercise.

With simple text, graphics, and hands-on activities, this book teaches readers about the ways coding is used in the complex inner workings of common items such as traffic lights and smoke detectors.


Explores some of today's most impressive technological innovations and how they are shaping the world.


By the time someone turns 21, they'll likely have spent about 200 days of their life playing video games, and even more using a mobile phone. Readers know that technology is a huge part of our lives, but they might not know exactly how some of it works. This book uses labeled infographics accompanied by simple, understandable text to tackle both familiar technology, such as cell phones, and newer technology, like solar panels. Each infographic describes how the technology works, relating to readers' daily lives as well as the STEM curriculum.


Cartoonist Zach Weinersmith (Saturday Morning Breakfast Cereal) and researcher Dr. Kelly Weinersmith give us a snapshot of what's coming next, from robot swarms to nuclear-fusion-powered toasters. By weaving their own research, interviews with the scientists who are making these advances happen, and Zach's trademark comics, the Weinersmiths investigate why these technologies are needed, how they would work, and what is standing in their way.


In Exploring Distant Worlds as a Space Robot Engineer, readers will meet the scientists who design and build robots, send them into space, and even drive the rovers that are exploring Mars today.
NC650L  Shores, Erika L. *Animal Robots*. North Mankato, MN: Capstone Press, 2015. 629.8 SH78A

Simple text and full-color photographs describe eight different robots that mimic animals and the work these robots do.


Provides a look at sports and nanotechnology, and discusses how this science, which manipulates objects at the atomic level, is being used to create high-tech swimsuits, tennis rackets, golf clubs, running shoes, and other sporting equipment.

**BIOGRAPHY**


This picture-book biography explains how Farnsworth held on to his dream to develop television and the scientific concepts behind it.


Offers an illustrated telling of the story of Ada Byron Lovelace, from her early creative fascination with mathematics and science and her devastating bout with measles, to the ground-breaking algorithm she wrote for Charles Babbage's analytical engine.

**ENGINEERING**

**EASY**

N/A  Barnett, Marc. *Oh No! Not Again! (Or How I Built a Time Machine to Save History) (Or at Least My History Grade)*. New York: Disney-Hyperion, 2012. E B2646ONN

When she does not get a perfect score on her history test, a young girl builds a time machine to remedy the situation.

A young girl narrates her family’s move from the city to the country, where they have bought a piece of land and live in a trailer while they build a house from the ground up, with help from relatives and friends.

Robert and his friend Charlie are proud of their fathers, who are working on the construction of San Francisco's Golden Gate Bridge.

In the summer of 1851, with encouragement and ideas provided by his family, an inventor builds a working submarine and takes his family for a ride.

Wordless picture book about a boy who loses his paper boat in the rain

Coping with a loss, a father and daughter rediscover an important piece of family history and begin to build a new life filled with adventure, in a book that features twenty letter-by-letter word shifts.

A little girl has a wonderful idea. With the help of her canine assistant, she is going to make the most magnificent thing! She knows just how it will look. She knows just how it will work. But making the most magnificent thing turns out to be harder than she thinks.

**NONFICTION**


It's windy on the Danish island of Samsø. Meet the environmentally friendly
folks who, in a few short years, worked together for energy independence, and who now proudly call their home Energy Island.


In 1870, Alfred Ely Beach invents New York's first underground train.


What would you do if you lived in a community without a library, hospital, post office, or fire department? If you were Benjamin Franklin, you'd set up these organizations yourself. Franklin also designed the lightning rod, suggested the idea of daylight savings time, and invented bifocals—all inspired by his common sense and intelligence. In this informative book, Gene Barretta brings Benjamin Franklin's genius to life, deepening our appreciation for one of the most influential figures in American history.


When 14-year-old William Kamkwamba's Malawi village was hit by a drought in 2001, everyone's crops began to fail. His family didn't have enough money for food, let alone school, so William spent his days in the library. He came across a book on windmills and figured out how to build a windmill that could bring electricity to his village. Everyone thought he was crazy but William persevered and managed to create a functioning windmill out of junkyard scraps. Several years later he figured out how to use the windmill for irrigation purposes.


Follow the development of bridges, as they have grown longer and bigger, and more fantastical through engineering skill, design and ambition.


In Exploring Distant Worlds as a Space Robot Engineer, readers will meet the scientists who design and build robots, send them into space, and even drive the rovers that are exploring Mars today.
A collection of concrete poetry, illustrations, and photographs that shows how young children's constructions, created as they play, are reflected in notable works of architecture from around the world.

Discover unexpected ways to turn common materials into crafty contraptions that range from surprisingly simple to curiously complex. In color photos, you'll be guided to create slingshot rockets, unique catapults, and even hydraulic-powered machines. Whether you build one or all 19 of these designs, you'll feel like an ingenious engineer when you're through.

**BIOGRAPHY**

Examines how the engineer George Ferris invented and constructed the amusement park ride that bears his name for the 1893 Chicago World's Fair.

Chronicles the life and achievements of the NASA engineer and inventor, from his childhood to his accidental invention of the Super Soaker water gun.

Mattie Knight loved to make things ranging from a foot warmer for her mother or toys for her older brothers. Or, when she was 12, a metal guard to prevent shuttles from shooting off looms and hurting workers. Later, Mattie invented a machine that could cut and glue the square-bottomed paper bags we still use today. Meet the woman known as "the Lady Edison."

Award-winning artist Sweet tells the story of the puppeteer Tony Sarg, capturing his genius, his dedication, his zest for play, and his long-lasting gift to
America--the inspired helium balloons that would become the trademark of Macy's Thanksgiving Day Parade.

MATHEMATICS

BIG BOOKS


Each time the doorbell rings, there are more people who have come to share Ma's wonderful cookies. This terrific and suspenseful read-aloud picture book about friendship, sharing, and cookies can also be used to introduce basic math concepts to young children.

EASY


A humorous, rhythmic, read-aloud story about a boy who awakens to find that everything around him is odd. He has three sleeves on his shirt, and his dog has five legs... Things are no better at school either. Will his odd day end when he goes to bed that night?


In Fibonacci's Field, Lonely and Chalk Rabbit meet, snuggle together, and then spend a year trying to cope with their ever-increasing brood and the seasonal changes that bring a new challenge each month.


Build, balance, count - question, estimate, measure - predict, crash, and build again with Elephant and a bucket full of blocks. Follow along as Elephant goes through the ups and downs of creating something new and finally celebrates the job of pride and success.


After the sight of a night sky filled with stars makes eight-year-old Uma feel very small, she asks people how they think about infinity and gets a variety of
answers before realizing the comfort in knowing that some things go on forever.


In order to have fun at a game of tug-of-war, forest animals balance the teams by using a see-saw. Includes nonfiction math notes for meanings of equal.


To keep from being eaten, an inchworm measures a robin's tail, a flamingo's neck, a toucan's beak, a heron's legs, and a nightingale's song.


Thrown in jail because the bed he made for the Queen is too small, an apprentice comes up with a more accurate way of measuring size.


When the teacher tells her class that they can think of almost everything as a math problem, one student acquires a math anxiety which becomes a real curse.


Celebrates the shape of a spiral in nature, from rushing rivers to flower buds and even the shape of an ear.

**NONFICTION**


Small and large, short and tall, little and big, these are all words that help us describe size. This math concepts volume doesn't just 'tell'; it shows early learners the difference between concepts, introduces them to synonyms, and helps them learn to sort a group according to size. Classification is an important concept for the early elementary mathematics student, but the text and photographs in this book, including dogs, fish, and birds, make it fun!
A look at the numbers that surround us, big and small, on earth and in outer space.

Provides an introduction to weight and the two systems that are used to measure it.

Lisa learns about the mathematics of measuring by measuring her dog Penny with all sorts of units, including pounds, inches, dog biscuits, and cotton swabs.

Illustrated riddles introduce strategies for solving a variety of math problems in using visual clues.

Growing up in Hungary during WWI, Erdos tried school but chafed at the rules and convinced his mother that he should study at home. He was fascinated by numbers from an early age, and by the time he was 20, he was known as The Magician from Budapest. Unable to do common tasks such as cooking, laundry, or driving, he spent his adult life flying around the world, staying with other mathematicians, and working collaboratively on challenging math problems.