

# **STEM/STEAM: A Bibliography of Resources**

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## **Stewart Resources Centre**

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\*Annotations have been excerpted and/or adapted from descriptions provided by the publishers.

025.21878 M323

Mardis, Marcia A.

**The Collection's at the core : revitalize your library with innovative resources for the common core and STEM**

Santa Barbara, CA: Libraries Unlimited, 2015.

*Subjects:* Libraries—Special collections—Engineering. Libraries—Special collections—Technology. Science—Study and teaching—Digital libraries. Libraries—Special collections—Mathematics. Science—Study and teaching—Computer network resources. School librarian participation in curriculum planning. Libraries—Special collections—Science. Libraries—Special collections—Electronic information resources. School libraries—Collection development. Open access publishing.

*Summary:* This book: enables school librarians to understand the nature and importance of STEM as well as the value of including high-quality, free STEM digital multimedia in library collections; presents effective strategies for promoting collections to ultimate beneficiaries including learners, educators, parents, community members, and, importantly, other school librarians; and gives school librarians specific criteria and sources with which to build STEM collections that meet national standards for science, health, technology, engineering, and mathematics as well as to select resources that cross curriculum areas.

333.794 S213

Sandall, Barbara R.

**Using STEM to investigate issues in alternative energy : middle grades**

Greensboro, NC: Mark Twain Media, 2011.

*Subjects:* Renewable energy sources—Study and teaching. Power resources—Study and teaching.

*Summary:* This book covers topics such as: oil spill cleanup; compressed air power; wind power; solar power; biomass and hydrogen fuel cells; and using science, mathematics, engineering, and technological design as a means for problem-solving and scientific inquiry.

338.19 S213

Sandall, Barbara R.; Singh, Abha

**Using STEM to investigate issues in food production : middle grades**

Greensboro, NC: Mark Twain Media, 2011.

*Subjects:* Food production—Study and teaching (Middle school). Farming—Study and teaching (Middle school).

*Summary:* This book covers topics such as biologically productive land and water; food systems, chains, and webs; food and energy; farming; hydroponics; and food processing and preservation.

363.7 S213

Sandall, Barbara R.; Singh, Abha

**Using STEM to investigate issues in managing waste : middle grades**

Greensboro, NC: Mark Twain Media, 2011.

*Subjects:* Environmental protection—Study and teaching (Middle school). Recycling (Waste, etc.)—Study and teaching (Middle school).

*Summary:* This book covers topics such as: solid waste, product life cycle, composting, waste management, packaging, and landfill construction. Students actively engage in solving real-world problems using scientific inquiry, content knowledge, and technological design.

372.21 E58

Englehard, Deirdre; Mitchell, Debby

**STEM play : integrating inquiry into learning centers**

Lewisville, NC: Gryphon House, Inc., 2016.

*Subjects:* Science—Study and teaching (Preschool)—Activity programs. Play. Education, Preschool—Activity programs.

*Summary:* This book describes activities to introduce children to aspects of the STEM (science, technology, engineering, and math) fields, including through art, dramatic play, movement, music, and literacy.

372.3 B858

Froschauer, Linda (Ed.)

**Bringing STEM to the elementary classroom**

Arlington, VA: NSTA Press, 2016.

*Subjects:* Curriculum planning. Mathematics—Study and teaching (Elementary). Engineering—Study and teaching (Elementary). Technology—Study and teaching (Elementary). Science—Study and teaching (Elementary).

*Summary:* The 36 lessons in this book are organized into grade-levels; grounded in science education research; designed to encourage learning across disciplines, promote real-world problem-solving skills, introduce children to STEM careers, and serve all students equally well; and connected to all elements of the Next Generation Science Standards.

372.3 R287

Reagan, Miranda Talley

**STEM-infusing the elementary classroom**

Thousand Oaks, CA: Corwin, 2016.

*Subjects:* Interdisciplinary approach in education. Mathematics—Study and teaching (Elementary). Science—Study and teaching (Elementary). Education, Elementary—Activity programs.

*Summary:* This guide helps teachers quickly infuse STEM concepts into all content areas. Real-world vignettes, sample lesson templates, discussion questions and immediately applicable action steps help to promote college and career ready skills seamlessly.

372.35 C856

Counsell, Shelly; Escalada, Lawrence

**STEM learning with young children : inquiry teaching with ramps and pathways**

New York, NY: Teachers College Press, 2016.

*Subjects:* Mathematics—Study and teaching (Early childhood). STEM education. Early childhood education. Science—Study and teaching (Early childhood).

*Summary:* This one-of-a-kind resource uses a newly created Inquiry Teaching Model (ITM) as the conceptual framework and devotes specific attention to the importance of an inclusive, social, STEM learning environment in which children are free to collaborate, take risks, and investigate within the context of exploratory and constructive play.

372.35 B268

Barr, Janis; Vanden Heuvel, Rita

**Canadian daily STEM activities. Grade 1**

Toronto, ON: Chalkboard Publishing, 2016.

*Subjects:* Creative activities and seat work. Science—Study and teaching (Primary).

Technology—Study and teaching (Primary). Mathematics—Study and teaching (Primary).

*Summary:* This resource includes: Needs of living things—Energy—Materials, objects, and structures—Daily and seasonal change—STEM occupations.

372.35 B268

Barr, Janis; Vanden Heuvel, Rita

**Canadian daily STEM activities. Grade 2**

Toronto, ON: Chalkboard Publishing, 2016.

*Subjects:* Technology—Study and teaching (Primary). Mathematics—Study and teaching (Primary). Creative activities and seat work. Science—Study and teaching (Primary).

*Summary:* This resource includes: Growth and changes in animals—Properties of liquids and solids—Simple machines—Air and water in the environment—STEM occupations.

372.35 B268

MacDonald, David

**Canadian daily STEM activities. Grade 3**

Toronto, ON: Chalkboard Publishing, 2016.

*Subjects:* Science—Study and teaching (Primary). Technology—Study and teaching (Primary). Creative activities and seat work. Mathematics—Study and teaching (Primary).

*Summary:* This resource includes: Growth and changes in plants—Forces and movement — Stability and structures—Soils and the environment—STEM occupations.

372.35 B268

Barr, Janis; MacDonald, David

**Canadian daily STEM activities. Grade 4**

Toronto, ON: Chalkboard Publishing, 2016.

*Subjects:* Science—Study and teaching (Elementary). Technology—Study and teaching (Elementary). Creative activities and seat work. Mathematics—Study and teaching (Elementary)

*Summary:* This resource includes: Habitats and communities—Pulleys and gears—Light and sound—Rocks and minerals—STEM occupations.

372.35 B268

**Canadian daily STEM activities. Grade 5**

On order

372.35 B268

Barr, Janis; MacDonald, David

**Canadian daily STEM activities. Grade 6**

Toronto, ON: Chalkboard Publishing, 2016.

*Subjects:* Technology—Study and teaching (Elementary). Creative activities and seat work. Mathematics—Study and teaching (Elementary). Science—Study and teaching (Elementary).

*Summary:* Includes: Diversity of living things—Properties of air and characteristics of flight—Electricity—Space—STEM occupations.

372.35 F634

Flores, Christa

**Making Science: Reimagining STEM education in middle school and beyond**

Torrance, CA: Constructing Modern Knowledge Press, 2016.

*Subjects:* Technology—Study and teaching (Middle school). Middle schools—Case studies. Science—Study and teaching (Middle school). Mathematics—Study and teaching (Middle school).

*Summary:* Richly illustrated with examples of student work, this book offers project ideas, connections to the new Next Generation Science Standards, assessment strategies, and practical tips for educators.

372.35 H698

Hoffer, Wendy Ward

**Cultivating STEM identities : strengthening student and teacher mindsets in math and science**

Portsmouth, NH: Heinemann, 2016.

*Subjects:* Technology—Study and teaching (Elementary). Science—Study and teaching (Elementary). Mathematics—Study and teaching (Elementary).

*Summary:* This book shows how to embrace a growth mindset and model the curiosity, persistence, flexibility, and positive regard for STEM needed to design and facilitate rich STEM experiences for all students. Each chapter includes current research findings along with concrete, practical approaches to help you make STEM learning meaningful and to foster students' independence as mathematicians and scientists.

372.35 M818

Moomaw, Sally

**Teaching STEM in the early years : activities for integrating science, technology, engineering, and mathematics**

St. Paul, MN: Redleaf Press, 2013.

*Subjects:* Technology—Study and teaching (Early childhood). Mathematics—Study and teaching (Early childhood). Science—Study and teaching (Early childhood). Engineering—Study and teaching (Early childhood).

*Summary:* The foundation for science, technology, engineering, and mathematics education begins in the early years. This book provides activities and learning centre ideas that seamlessly integrate STEM throughout your early childhood classroom.

372.35 S658

Smith, Robert

**Stepping into STEM. Grade 4 : a guided-to-independent approach to STEM-based learning**

Garden Grove, CA : Teacher Created Resources, 2016.

*Subjects:* Science—Study and teaching (Elementary). Creative activities and seat work. Technology—Study and teaching (Elementary). Mathematics—Study and teaching (Elementary).

*Summary:* This resource provides guided lessons to integrate project-based learning into your science, technology, engineering, and math curricula. Each unit provides background information for teachers and students and moves from teacher-directed activities towards more open-ended activities.

372.35 S658

Smith, Robert

**Stepping into STEM. Grade 6 : a guided-to-independent approach to STEM-based learning**

Garden Grove, CA: Teacher Created Resources, 2016.

*Subjects:* Creative activities and seat work. Science—Study and teaching (Elementary). Mathematics—Study and teaching (Elementary). Technology—Study and teaching (Elementary).

*Summary:* This resource provides guided lessons to integrate project-based learning into your science, technology, engineering, and math curricula. Each unit provides background information for teachers and students and moves from teacher-directed activities towards more open-ended activities.

372.35 V335

Vasquez, Jo Anne; Sneider, Cary Ivan

**STEM lesson essentials, grades 3-8 : integrating science, technology, engineering, and mathematics**

Portsmouth, NH: Heinemann, 2013.

*Subjects:* Technology—Study and teaching (Elementary). Engineering—Study and teaching (Elementary). Science—Study and teaching (Elementary). Mathematics—Study and teaching (Elementary).

*Summary:* This book shows teachers how to begin the STEM integration journey with: five guiding principles for effective STEM instruction, classroom examples of what these principles look like in action, sample activities that put all four STEM fields into practice, and lesson planning templates for STEM units.

372.5 S725

Sousa, David; Pilecki, Thomas

**From STEM to STEAM : using brain-compatible strategies to integrate the arts**

Thousand Oaks, CA: Corwin, 2013.

*Subjects:* Arts—Study and teaching. Interdisciplinary approach in education. Science—Study and teaching. Cognitive learning.

*Summary:* The authors bring you: details of brain research connecting STEM and the arts, teacher-tested techniques for fitting the arts into STEM classrooms, sample lesson plans across K-12, a worksheet template for designing your own arts-integrated STEM lessons, tips for

managing time and collaborating, real-life examples and anecdotes, and strategies for involving the whole school community in STEAM initiatives.

372.5044 M397

Maslyk, Jacie

**STEAM makers : fostering creativity and innovation in the elementary classroom**

Thousand Oaks, CA: Corwin, 2016.

*Subjects:* Interdisciplinary approach in education. Science—Study and teaching (Elementary). Arts—Study and teaching (Elementary). Creative activities and seat work. Education, Elementary—Activity programs.

*Summary:* This resource outlines step-by-step processes to help anyone start their STEAM and Maker journey. It includes charts, checklists, web links, and profiles to help you make meaningful subject area connections and tap your students' natural curiosity.

507.1 S416

Slavin, Robert E. (Ed.)

**Science, technology, and mathematics (STEM)**

Thousand Oaks, CA: Corwin, 2014.

*Subjects:* Mathematics—Study and teaching. Engineering—Study and teaching. Technology—Study and teaching. Science—Study and teaching.

507.1 S559

**Show me what you know : exploring student representations across STEM disciplines**

New York, NY: Teachers College Press, 2013.

*Subjects:* Technology—Study and teaching. Engineering—Study and teaching. Mathematics—Study and teaching. Science—Study and teaching.

*Summary:* This book showcases research on representations across a range of STEM disciplines and ages, from children as young as two years of age to professional mathematicians. The text highlights the importance of paying close attention to learners' interpretations and productions of different representations as a source of evidence for what learners understand. The text is organized around four themes: appropriation of representations, making meaning, highlighting, and representations as scaffolds and supports.

507.1 S827

Stephan, Michelle

**Lesson imaging in math and science : anticipating student ideas and questions for deeper STEM learning**

Alexandria, VA: ASCD, 2017.

*Subjects:* Mathematics—Study and teaching. Science—Study and teaching. Inquiry-based learning. Lesson planning.

*Summary:* From respected voices in STEM education comes an innovative lesson planning approach to help turn students into problem solvers: lesson imaging.

507.1073 B925

Buckner, Traci; Boyd, Brian

**STEM leadership : how do I create a STEM culture in my school?**



Alexandria, VA: ASCD, 2015.

*Subjects:* Community and school. Educational leadership. Mathematics—Study and teaching. Engineering—Study and teaching. Technology—Study and teaching. Science—Study and teaching.

*Summary:* This book will explain what school leaders can do to improve the quality of STEM education in their buildings and to help teachers improve STEM learning for their students. They claim leaders can achieve these goals by fostering equitable access to rich and rigorous learning, acting as instructional leaders, and building community engagement and partnerships.

507.1073 M894

Mosatche, Harriet S.; Lawner, Elizabeth K.

**Breaking through! : helping girls succeed in science, technology, engineering, and math**  
Waco, TX: Prufrock Press, Inc., 2016.

*Subjects:* Sex differences in education. Girls—Education. Mathematics—Study and teaching. Science—Study and teaching.

*Summary:* This book offers topics ranging from how role models can make a difference to finding non-stereotypical toys to taking trips that inspire STEM discovery and engagement. These ideas are illustrated with research evidence and real-life examples from girls and women.

507.12 J82

Jorgenson, Olaf; Vanosdall, Rick

**Doing good science in middle school : a practical STEM guide, including 10 new & updated activities**

Arlington, VA: NSTA Press, 2014.

*Subjects:* Inquiry-based learning. Engineering—Study and teaching (Middle school). Technology—Study and teaching (Middle school). Mathematics—Study and teaching (Middle school). Science—Study and teaching (Middle school).

507.12 MS824

Traig, Jennifer (Ed.)

**STEM to Story. Enthralling and effective lesson plans for grades 5-8**

San Francisco, CA: Jossey-Bass, 2015.

*Subjects:* Creative writing (Elementary education). Science—Study and teaching (Elementary)

509.252 I24

Ignotofsky, Rachel

**Women in science : 50 fearless pioneers who changed the world**

Berkeley, CA: Ten Speed Press, 2016.

*Subjects:* Women scientists—Biography.

*Summary:* Scientists included: Hypatia (350 CE-370-415 CE (?)) — Maria Sibylla Merian (1647-1717) — Wang Zhenyi (1768-1797) — Mary Anning (1799-1847) — Ada Lovelace (1815-1852) — Elizabeth Blackwell (1821-1910) — Hertha Ayrton (1854-1923) — Karen Horney (1885-1952) — Nettie Stevens (1861-1912) — Florence Bascom (1862-1945) — Marie Curie (1867-1934) — Mary Agnes Chase (1869-1963) — Timeline — Lise Meitner (1878-1968) — Lillian Gilbreth (1878-1972) — Emmy Noether (1882-1935) — Edith Clarke (1883-1959) — Marjory Stoneman Douglas (1890-1998) — Alice Ball (1892-1916) — Gerty Cori (1896-1957)

— Joan Beauchamp Procter (1897-1931) — Cecilia Payne-Gaposchkin (1900-1979) — Barbara McClintock (1902-1992) — Maria Goeppert Mayer (1906-1972) — Grace Hopper (1906-1992) — Rachel Carson (1907-1964) — Lab tools — Rita Levi-Montalcini (1909-2012) — Dorothy Hodgkin (1910-1994) — Chien-Shiung Wu (1912-1997) — Hedy Lamarr (1914-2000) — Mamie Phipps Clark (1917-1983) — Gertrude Elion (1918-1999) — Katherine Johnson (1918- ) — Jane Cooke Wright (1919-2013) — Rosalind Franklin (1920-1958) — Rosalyn Yalow (1921-2011) — Esther Lederberg (1922-2006) — Statistics in STEM — Vera Rubin (1928- ) — Annie Easley (1933-2011) — Jane Goodall (1934- ) — Sylvia Earle (1935- ) — Valentina Tereshkova (1937- ) — Patricia Bath (1942- ) — Christiane Nüsslein-Volhard (1942- ) — Jocelyn Bell Burnell (1943- ) — Sau Lan Wu (194?- ) — Elizabeth Blackburn (1948- ) — Katia Krafft (1942-1991) — Mae Jemison (1956- ) — May-Britt Moser (1963- ) — Maryam Mirzakhani (1977- ).

600 G739

Graham, Ian; Jackson, Tom

**Super cool tech : technology, invention, innovation**

New York, NY: Dorling Kindersley, 2016.

*Subjects:* Inventions—Juvenile literature. Technology—Juvenile literature.

*Summary:* From 3-D-printed cars to robot vacuum cleaners, this title reveals today's amazing inventions and looks ahead to the future of technology, including hologram traffic lights and the Galactic Suite Hotel in space. Perfect for STEAM education initiatives, this book makes technology easy to understand, following the history of each invention, how they impact our everyday lives, and "How It Works" panels explaining the design and function of each item using clear explanations and images.

620.00711 T866

Truesdell, Pamela

**Engineering essentials for STEM instruction : how do I infuse real-world problem solving into science, technology, and math?**

Alexandria, VA: ASCD, 2014.

*Subjects:* Science—Study and teaching (Higher). Technical education. Engineering—Study and teaching (Higher). Mathematics—Study and teaching (Higher).

*Summary:* In this practical introduction to engineering for elementary through high school teachers, you'll learn how to create effective engineering-infused lessons that break down the barriers between science, math, and technology instruction. The author highlights engineering's connection to 21st century skills and college and career readiness, walking you through each step of the simple but powerful engineering design process.