YOUR TOOLKIT FOR

# Early Childhood STEM Education

VIEW THIS TOOLKIT ONLINE for easy linking to the resources:
www.brookespublishing.com/stem-toolkit

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When it comes to giving kids a solid foundation in STEM (Science, Technology, Engineering and Math), it's never too soon to start. **Curious young children are natural mathematicians and scientists**, and your early childhood classroom is the perfect place to get them planning, experimenting, measuring, problem-solving, and more. The **benefits can last a lifetime**: studies show that early exposure to STEM skills and concepts has a long-term impact on future academic skills.

This toolkit is packed with **more than 30 great resources**—from tip sheets and articles to webinars and video clips—designed to help you:

- deepen your knowledge about the importance of STEM
- discover what successful STEM-centered teaching practices look like
- boost your students' STEM skills with concrete examples and activities

Keep this toolkit as a handy reference to give your students the best start in STEM learning!

# General STEM resources

What does STEM look like in preschool? Listen to this interview with three early childhood experts who discuss what STEM is and why it's important.
http://www.teachpreschool.org/2012/06/stem/

This reader-friendly brief from ReadyNation outlines 4 compelling reasons for early STEM education.
http://www.readynation.org/uploads/20130318_ReadyNationSTEMBrieflowresnoendnotes.pdf

How can arts-based teaching strategies enhance STEM learning? These early childhood educators found out; get an inside peek at their workshop in this video.
http://www.youtube.com/watch?v=wFdiLWfbVSA

In this video, you'll get a sample hands-on lesson that demonstrates easy ways incorporate STEM in an early childhood classroom.
http://www.youtube.com/watch?v=HglYz0h2n2E

Great for preschool educators, this STEM Teaching Guide from Boston Children's Museum is filled with activities that help focus and refine the naturally inquisitive behaviors of 3–5 year olds.
http://www.bostonchildrensmuseum.org/sites/default/files/pdfs/STEMGuide.pdf

Four handy tip sheets for encouraging STEM thinking, from the Illinois Early Learning Project:

- Talk about the weather:
  http://illinoisearlylearning.org/tipsheets/weather.htm
- Geographic thinking through exploring the neighborhood:
  http://illinoisearlylearning.org/tipsheets/geography.htm
- Block play as a learning tool:
  http://illinoisearlylearning.org/tipsheets/blocks.htm
- Learn basic measurement concepts:
  http://illinoisearlylearning.org/tipsheets/fun-measure.htm

# SCIENCE resources

How can you cultivate young "scientists in waiting?" Find out in this Q&A with Rochel Gelman, author of *Preschool Pathways to Science (PrePS™)*. http://archive.brookespublishing.com/author-interviews/gelman-70441-interview.htm

Reading Rockets has a great Literacy in the Sciences series of activities. Try these two with your students:

- Journaling observations activity: http://www.readingrockets.org/article/41463
- Measuring activity: http://www.readingrockets.org/article/41232

PBS Learning Media's Everyday Science collection, produced by KET, gives you 16 engaging lessons that introduce young kids to basic concepts in science. Includes teaching tips and key vocabulary words. http://www.pbslearningmedia.org/collection/evscps/

The Office of Head Start's Discovering Science Webcast series is a must-watch! You'll discover lots of possibilities for making science an exciting learning experience, while improving children's skills in specific domains within the Head Start Outcomes Framework.

- #1 "Let's Do Science!" http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/domains%20of%20child%20development/science/sciencewebcasts.htm
- #2 "Look What I Know. See What I Can Do!" http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/domains%20of%20child%20development/science/ScienceWebcastS2.htm
- #3 "Language and Literacy through Science" https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/domains%20of%20child%20development/science/sciencewebcasts3.htm
- #4 "Bringing it All Together with Intentional Teaching in Effective Environments" http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/domains%20of%20child%20development/science/sciencewebcasts4.htm

(Don't miss the accompanying Teacher's Guide to the webcast series, too!) http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/Domains%20of%20Child%20Development/Science/ohs-science-guide-english.pdf

# TECHNOLOGY resources

Why should you integrate technology into the early childhood classroom, and how can you get started? Find out in this excerpt from *Instructional Technology in Early Childhood,* edited by Howard P. Parette Jr. & Craig Blum.
http://archive.brookespublishing.com/documents/instructional-technology.pdf

In the January 2014 issue of *TEACHING Exceptional Children,* Parette & Blum weighed in on Universal Design for Learning (UDL), technology integration, and flexible participation.
http://www.cec.sped.org/~/media/Files/Professional%20Development/ParetteBlum.pdf

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New technologies are revolutionizing the use of assistive technology in early childhood. Learn more in this Q&A from Kathleen Sadao and Nancy Robinson, authors of *Assistive Technology for Young Children.*
http://archive.brookespublishing.com/author-interviews/sadao-70915-interview.htm

Three examples of technology that supports early learning, from NAEYC.
http://www.naeyc.org/blog/technology-support-early-learning

# ENGINEERING resources

Discover the value of creating a construction-focused learning center, and how it boosts STEM learning.
http://www.naeyc.org/blogs/sfriedmannaeycorg/2014/01/how-explain-value-construction-learning-center-connect-it-stem

Read about the Ramps and Pathways project, specially designed to help children develop their emerging abilities in engineering and design. Get an inside look at this innovative project and see the photos!
http://ecrp.uiuc.edu/beyond/seed/zan.html

# MATH resources

An educator's practice guide to teaching math to young children; offers specific, evidence-based recommendations that address the challenge of teaching early math to children ages 3–6. http://ies.ed.gov/ncee/wwc/pdf/practice_guides/early_math_pg_111313.pdf

Teach young children math through play (LittleCounters® case story) http://www.brookespublishing.com/resource-center/archive/articles/teach-young-children-math/

Read this article on screening children for math delays early with the *Number Sense Screener* http://archive.brookespublishing.com/articles/ed-article-0312.htm

Read this article for tips on boosting young children's math skills http://archive.brookespublishing.com/articles/ec-article-0511.htm

Why is it so critical for teachers to promote spatial literacy in the classroom? Get the facts from Dr. Mary Jo Pollman, author of *Blocks and Beyond,* in this exclusive interview. http://archive.brookespublishing.com/author-interviews/pollman-71011-interview.htm

With just a little planning, you can use any storybook to teach critical math concepts. In this sample lesson plan from *Cowboys Count, Monkeys Measure, and Princesses Problem Solve,* you'll see how. http://archive.brookespublishing.com/newsletters/downloads/wilburne-story-books.pdf

This sample lesson plan from *Number Sense Interventions* covers counting and sequencing, recognizing quantities, basic number operations, and more. http://archive.brookespublishing.com/documents/number-sense-interventions.pdf

Learn how to incorporate math concepts at mealtime in this sample activity from *Let's Talk About Math.* http://archive.brookespublishing.com/documents/Kotsopoulos-math-activity.pdf

Watch this webinar to learn how the tiers of an RTI model can be incorporated in early childhood mathematics. https://www1.gotomeeting.com/register/960635712

# MATH resources *(continued)*

Get 10 sample lesson plans from NCTM, perfect for use in early childhood classrooms. Let's Count to 10, I've Seen That Shape Before, Tangram Puzzles, and more!
http://www.pinterest.com/nctmillum/pre-k2-lesson-plans/

What are the essential elements of an effective preschool math program? Get Ready to Read lays it all out for you and gives you tips to get you started.
http://getreadytoread.org/early-learning-childhood-basics/early-math/preschool-math-grows-up-tips-for-teachers

Share these tips with parents to help them understand what math skills young children should have—and how to help support their development.
http://getreadytoread.org/early-learning-childhood-basics/early-math/understanding-numbers-and-counting-skills-in-pre-schoolers

9 misconceptions about learning and teaching math in early childhood.
http://www.earlychildhoodaustralia.org.au/australian_journal_of_early_childhood/ajec_index_abstracts/early_childhood_teachers_misconceptions_about_mathematics_education_for_young_children_in_the_united_states.html

Discovering Shapes and Space in Preschool: This NAEYC article is packed with tips for teachers. http://www.naeyc.org/tyc/article/shapes_space

# Looking for more practical guidance and strategies?

## Check out our STEM resources at www.brookespublishing.com, including: