

Resources for Science in the Early Years

Young Children articles and NAEYC books and resources

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- Buchanan, B.L., & J.M. Rios. 2004. Teaching science to kindergartners: How can teachers implement science standards? *Young Children* 59 (3): 82–87.
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- Clark, A. 2007. A hundred ways of listening: Gathering children's perspectives of their early childhood environment. *Young Children* 62 (3): 76–81.
- Conezio, K., & L. French. 2002. Science in the preschool classroom: Capitalizing on children's fascination with the everyday world to foster language and literacy development. *Young Children* 57 (5): 12–18. www.naeyc.org/yc/pastissues/2002/september
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- Erickson, M.F. 2008. The Children & Nature Network: Ensuring that all children can spend quality time outdoors. www.naeyc.org/yc/pastissues/2008/january
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- Hoisington, C. 2002. Using photographs to support children's science inquiry. *Young Children* 57 (5): 26–32.
- Howley-Pfeifer, P. 2002. Raising butterflies from your own garden. *Young Children* 57 (6): 60–65.
- Humphries, J. 2000. Exploring nature with children. *Young Children* 55 (2): 16–20.
- Jones, J., & R. Courtney. 2002. Documenting early science learning. *Young Children* 57 (5): 34–40.
- Koralek, D., ed. 2003. *Spotlight on young children and science*. Washington, DC: NAEYC.
- MacMillan, M. 2008. Books for young children about nature. www.naeyc.org/yc/pastissues/2008/january
- McHenry, J.D., & K.J. Buerk. 2008. Infants and toddlers meet the natural world. *Young Children* 63 (1): 40–41. www.naeyc.org/yc/pastissues/2008/january
- Moriarty, R.F. 2002. Entries from a staff developer's journal . . . Helping teachers develop as facilitators of 3- to 5-year-olds' science inquiry. *Young Children* 57 (5): 20–24.
- Neuman, S., & K. Roskos. 2007. *Nurturing knowledge: Building a foundation for school success by linking early literacy to math, science, art, and social studies*. New York: Scholastic. Available from NAEYC.
- Nimmo, J., & B. Hallett. 2008. Childhood in the garden: A place to encounter natural and social diversity. *Young Children* 63 (1): 32–38. www.naeyc.org/yc/pastissues/2008/january
- Rosenow, N. 2007. Learning to love the earth . . . and each other. *Young Children* 63 (1): 10–13. www.naeyc.org/yc/pastissues/2008/january
- Russo, M., with S.G. Colurciello & R. Kelly. 2008. For the birds! Seeing, being, and creating the bird world. *Young Children* 63 (1): 26–30.
- Satterlee, D.J., & G.D. Cormons. 2007. Sparking interest in nature—Family style. *Young Children* 63 (1): 16–20.
- Sherwood, E.S., & A. Freshwater. 2006. Early learning standards in action: Young children exploring motion. www.naeyc.org/yc/pastissues/2006/september
- Spangler, S. 2009. Of Primary Interest. Beyond the fizz: Getting children excited about doing real science. *Young Children* 64 (4): 62–64. www.naeyc.org/yc/columns
- Starbuck, S., & M.R. Olthof. 2008. Involving families and communities through gardening. *Young Children* 60 (5): 74–79.
- Torquati, J., & J. Barber. 2005. Dancing with trees: Infants and toddlers in the garden. *Young Children* 60 (3): 40–47.
- West, M. 2007. Problem solving: A sensible approach to children's science and social studies learning—and beyond. *Young Children* 62 (5): 34–41.
- Williams, A.E. 2008. Exploring the natural world with infants and toddlers in urban settings. *Young Children* 63 (1): 22–25.
- *Worth, K., & S. Grollman. 2003. *Worms, shadows, and whirlpools: Science in the early childhood classroom*. Portsmouth, NH: Heinemann. Available from NAEYC.
- Woyke, P.P. 2004. Hopping frogs and trail walks. *Young Children* 59 (1): 82–85.
- Yongquist, J. 2004. From medicine to microbes: A project investigation of health. *Young Children* 59 (2): 28–32.

* Selections by **Peggy Ashbrook**, preschool science teacher, author, blogger, and editor of The Early Years column in *Science and Children* from the National Science Teachers Association. Special thanks to Peggy for contributions to this resource list and guidance on the science cluster.

Other articles, books, and resources

- *Ansberry, K., & E. Morgan. *More picture-perfect science lessons: Using children's books to guide inquiry, K–4*. Arlington, VA: National Science Teachers Association Press.
- Ashbrook, P. 2003. *Science is simple: Over 250 activities for preschoolers*. Beltsville, MD: Gryphon House.
- Brennan, G., & E. Brennan. 2004. *The children's kitchen garden: A book of gardening, cooking, and learning*. Berkeley, CA: Ten Speed Press.
- Carnegie Corporation of New York and Institute for Advanced Study: Commission on Mathematics and Science Education. 2009. *The opportunity equation: Transforming mathematics and science education for citizenship and the global economy*. New York: Author.
- Charner, K. 1998. *The giant encyclopedia of science activities for children 3 to 6*. Beltsville, MD: Gryphon House.

STEM (Science, Technology, Engineering, and Mathematics) fields are the core of a technologically advanced society, and they are the fields of study that are declining in the U.S. education system. The National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and The National Academies, among others, are working to improve STEM education in the United States. These organizations have proposed a national action plan, initiated science-focused programs, implemented curricula, and suggested federal policy changes in an effort to increase the number of people studying and pursuing careers in the STEM fields. These organizations and others are lobbying to ensure that STEM subjects receive more attention and more funding in schools. They also encourage educators to use an integrated curriculum and to connect science and math with other disciplines.

The STEM Education Coalition supports students, teachers, and government agencies involved in pursuing STEM-related programs. The *Journal of STEM Education* is a peer-reviewed journal for educators in these fields, focusing on real-world case studies with practical applications. The STEM Education Caucus focuses on strengthening education for K–12 and the workforce. The National Science Foundation has STEM projects for K–12 students: Discovery Research K–12 and NSF Academies for Young Scientists.

- Discovery Research K–12:** www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047
- Journal of STEM Education:** www.jstem.org
- National Science Foundation (NSF):** www.nsf.gov/nsb/stem/index.jsp
- NSF Academies for Young Scientists:** www.nsf.gov/funding/pgm_summ.jsp?pims_id=13677
- STEM Education Caucus:** www.stemedcaucus.org
- STEM Education Coalition:** www.stemedcoalition.org

Online resources

- Eichinger, J. 2009. *Activities linking science with mathematics, grades K–4*. Arlington, VA: National Science Teachers Association.
- *Evitt, M.F., with T. Dobbins & B. Weesen-Baer. 2009. *Thinking BIG, learning BIG: Connecting science, math, literacy, and language in early childhood*. Beltsville, MD: Gryphon House.
- Gelman, R., K. Brennehan, G. Macdonald, & M. Roman. 2009. *Preschool pathways to science (PrePS): Facilitating scientific ways of thinking, talking, doing, and understanding*. Baltimore: Brookes.
- Jacobs, G., & K. Crowley. 2007. *Play, projects, and preschool standards: Nurturing children's sense of wonder and joy in learning*. Thousand Oaks, CA: Corwin.
- Keeler, R. 2008. *Natural playscapes*. Bellevue, WA: Exchange Press.
- *Kohl, M.F., & J. Potter. 1993. *Science arts: Discovering science through art experiences*. Bellingham, WA: Bright Ring Publishing.
- *Lehn, B. 1998. *What is a scientist?* Brookfield, CT: Millbrook Press.
- Matricardi, J., & J. McLarty. 2005. *Science activities A to Z*. Clifton Park, NJ: Thomson Delmar Learning.
- McNair, S. 2006. *Start young! Early childhood science activities*. Arlington, VA: National Science Teachers Association Press.
- Molland, J. 2009. *Get out! 150 easy ways for kids and grown-ups to get into nature and build a greener future*. Minneapolis, MN: Free Spirit.
- *Moomaw, S., & B. Hieronymus. 1997. *More than magnets: Exploring the wonders of science in preschool and kindergarten*. St. Paul, MN: Redleaf.
- *National Research Council. 1996. *National Science Education Standards: Observe, interact, change, learn*. Washington, DC: National Academies Press. www.nap.edu/catalog/4962.html
- National Research Council. 2000. *Inquiry and the National Science Education Standards: A guide for teaching and learning*. Washington, DC: National Academies Press. www.nap.edu/openbook.php?record_id=9596&page=R1
- Neill, P. 2008. *Real science in preschool: Here, there, and everywhere*. Ypsilanti, MI: HighScope.
- Neises, M., L. Hogue, & M. Sarquis. 2009. *Marvelous moving things: Early childhood science in motion*. Big Science for Little Hands. Middletown, OH: Terrific Science Press.
- Neumann-Hinds, C. 2007. *Picture science: Using digital photography to teach young children*. St. Paul, MN: Redleaf.
- Pica, R. 2009. *Jump into science: Active learning for preschool children*. Beltsville, MD: Gryphon House.
- Prairie, A.P. 2005. *Inquiry into math, science, and technology for teaching young children*. Clifton Park, NJ: Delmar Cengage.
- *Ritz, R. 2007. *A head start on science: Encouraging a sense of wonder*. Arlington, VA: National Science Teachers Association Press.
- Seefeldt, C., & A. Galpev. 2006. *Active experiences for active children: Science*. 2nd ed. Upper Saddle River, NJ: Prentice Hall.
- Sherwood, E., R. Rockwell, & R. Williams. 2008. *Science adventures: Nature activities for young children*. Beltsville, MD: Gryphon House.
- Solway, A., & J. Amos. 2000. *Animals and nature: Our planet and the animals that live here*. A Scholastic First Encyclopedia. New York: Scholastic.
- Ward, J. 2008. *I love dirt! 52 activities to help you and your kids discover the wonders of nature*. Boston: Trumpeter.

Council for Environmental Education (CEE) provides programs and services to promote environmental education for young children and educators. CEE's new initiative, Growing Up WILD: Exploring Nature with Young Children, guides educators as they engage young children in exploring wildlife and the natural world. It focuses on children ages 3–7 and features activities that are developmentally appropriate.

www.councilforee.org and www.projectwild.org/GrowingUpWild.htm

Exploratorium, a hands-on museum based in San Francisco, offers multimedia resources including a digital library, professional development resources, workshops, programs, and hundreds of activities with accompanying explanations of how the science behind them works. You can't beat the impression a cow eyeball dissection makes on a second-grader (which can be watched online). <http://exploratorium.edu>

Ladybug, a magazine for young children, features seasonal articles and poems that include science concepts. Readers will also find science activities and reading suggestions. www.ladybugmagkids.com

Mother Goose Programs: Math & Science uses books, hands-on explorations, and standards to create its math and science programs. The site offers numerous free articles in its resources section and a list of science books for preschoolers. www.mothersgooseprograms.org/math_science.php

National Geographic Little Kids brings beautiful photography to young readers in a magazine for children filled with animal stories, science activities, puzzles, and games. The Web site also includes a special section for parents on how to best use the Web site and the magazine. <http://kidsblogs.nationalgeographic.com/littlekids>

National Science Teachers Association offers a wealth of science resources, lessons, discussions, forums, and newsletters for the primary grades and up. Its Web site features a section for new science teachers. It also has a blog focusing on teaching science to young children, which covers a vast number of topics, from standards to studying motion to teaching strategies. The association offers a peer-reviewed journal for early childhood and elementary educators. www.nsta.org and <http://blogs.nsta.org/EarlyYearsBlog/default.aspx> and www.nsta.org/elementaryschool

National Wildlife Federation publishes two magazines for young children, *Your Big Backyard* and *Wild Animal Baby*. Each issue has pictures of baby animals, suggests science activities, and features games to encourage learning and science. www.nwf.org

Southwest Center for Education and the Natural Environment (SCENE) at Arizona State University connects the community, teachers, and students to science. Its Web site offers activities, explains scientific inquiry, and explores the scientific method. <http://scene.asu.edu/index.html>

Try Science has experiment activities, video clips, and information on various science phenomena. It includes pages for teachers and parents and is available in multiple languages, including Spanish and Arabic. The parent page explains why science is so important and how parents can get involved. <http://tryscience.org>

Tips for Using Online Resources

Look for these qualities in online resources to identify ones that are appropriate for engaging in scientific inquiry with young children.

1. Is the Web site part of a government or educational institution with some expertise? Find a second source to double-check the appropriateness of product-oriented Web site activities.
2. Was the activity tested in a classroom?
3. Does the lesson plan list related national, state, or local standards or those of professional associations?
4. Does the lesson plan list objectives or science concepts involved?
5. Are safety concerns addressed in the lesson plan—allergies, small objects, safe science practices such as eye protection?
6. Is there suggested dialogue or open-ended questions given as a model for the teacher?
7. Are science concepts reviewed so teachers can knowledgeably guide children?
8. Does the lesson plan include discussion time for observations and the reasoning behind them?
9. Are additional resources listed?
10. Is a suggested assessment tool provided or recommended?