**Required and Recommended Readings**

Teachers work hard to find the best ideas to improve their teaching practice. We hope the articles we’ve included in this section of the Participant Resource Notebook provide background and best ideas for linking science and engineering instruction.

**• ALL PARTICIPANTS** should reflect on the two foundational articles listed below and sent to you in your Confirmation Packet in your journal.

**• PARTICIPANTS EARNNG GRADUATE CREDIT** should reflect on 3 additional journal articles, either the ones provided in this section of the Participant Resource Notebook or by accessing additional articles via the web. Ask your instructors for assistance if you have difficulties with the web links. Let us know the ideas that matter to you!

***For Everyone: Reflect on these 2 foundational articles in your journal.***

Bell, Randy L., Lara Smetana, and Ian Binns. “Simplifying Inquiry Instruction.” *The Science Teacher.* October, 2005, pp. 30-33. Arlington, VA: NSTA Press.

***Standard article to distinguish a continuum of levels of inquiry.***

Bybee, Rodger W. "Scientific and Engineering Practices in K – 12 Classrooms: Understanding a Framework for K–12 Science Education." *Science Scope,* December, 2011, pp 6-13. Arlington, VA: NSTA Press.

***Intro to NGSS Sci/Eng Practices: Why practice? Why engineering?***

***For Graduate Credit: Choose 3 more articles for reflection in your journal.***

Biomimicry Institute. "What is Biomimicry? What is the biomimicry design model?

<http://biomimicryinstitute.org/about-us/what-is-biomimicry.html> 5/14/2012

***Intro to biomimicry as a basis for engineering design.***

Everett, S. and R. Moyer. “Methods & Strategies: ‘Inquirize’ Your Teaching: A Guide to Turning your Favorite Activities into Inquiry Lessons*” Science and Children*. March, 2007, pp. 54-57. Arlington, VA: NSTA Press.

***Standard article to adapt prior activities to inquiry.***

Morris, Rebecca. "Transforming a Field Trip into an Expedition." Science Scope. January, 2012, pp. 68-73. Arlington, VA: NSTA Press.

***Ways to make your field trip support inquiry learning and science content.***

***For Teachers of Grades 3-5***

• Gerlach, Jonathan W. "Elementary Design Challenges." *Science and Children,* March, 2010, pp. 43-47. Arlington, VA: NSTA Press.

***Based on NASA's Engineering Design Challenges Program; offers a visual of the engineering design process that is simpler than the one in the MA Curriculum Framework, makes a link from the engineering to challenge to "open, inquiry" good example of testing, formal instruction to clear misconceptions, and redesign. Good link to literacy: talk and write. Clear links to science concepts: thrust, lift, weight, drag.***

• Yocom de Romero, Nancy, et al. "Design Challenges "ELL"-ementary." *Science and Children,* January, 2006. pp. 34-37. Arlington, VA: NSTA Press.

***Linked to literacy; linked to Museum of Science good website (Engineering is Elementary); good integration of science and engineering practices in designing a wall; can add "Asknature.com" and come up with inspirations for how nature builds walls: termites; bees.***

***For Teachers of Grades 6-8***

• Lightl, Kimberly. "More than just the technology." Science Scope, Summer, 2011, pp. 6-9,Arlington, VA: NSTA Press.

***Update on Bloom's Taxonomy.***

• Turner, Jaclyn. "Thinking about students' questions." Science Scope, November, 2006, pp. 51-54.Arlington, VA: NSTA Press.

***Clarifying types of questions. Scientific questions as the root of inquiry.***

• Sinsel, Jennifer. "The Future Scientists and Engineers Conference." Science Scope, December, 2008, pp.14-19. Arlington, VA: NSTA Press.

***Hands-on, minds-on, community on. Good synthesis of formal and informal science education.***