

Identifying a Progression of Learning

A sequence works in a way a collection never can.

—George Murray

I'm sure you have had an experience similar to this one: I was beginning an investigation involving the states of matter and began to elicit prior understanding from my students. There were students in my class who were far beyond an introductory level—they could clearly explain and provide examples of each state, explain how a substance could change states, and accurately answer any question posed by other students. On the other end of the spectrum, there were students who had difficulty identifying the state of materials we were working with. I discovered that the main factor was the experiences students had with previous teachers. There had not been a specified progression of learning determined for our school system. We were all using the same textual material, but that did not necessarily mean that teachers were providing instruction to support understanding of specific core ideas and eliminating others at the appropriate grade level. How much easier it would be, how much more learning would occur, and how much time we would save if all students brought the same background knowledge and skills to what they are learning!

But, how do we accomplish an instructional sequence that supports a valid learning progression and can be followed by our learning community? The *Next Generation Science Standards (NGSS)* provides information to support the development of learning progressions based on research. Even if your state has not adopted and your schools are not using NGSS, the research behind the placement of disciplinary core ideas (DCIs), science and engineering practices (SEPs), crosscutting concepts (CCs), and student outcomes shown in the performance expectations is provided as a valid learning progression leading to the development of abilities and core ideas.

You may have missed what NGSS has to offer. The first place to look is at the beginning of each grade level set of standards. This storyline gives you a good overview of what students should be dealing with at grade level. Next, look at each standards page. Following each of the performance expectations you will find a clarification statement. This statement provides possible information that might be included as well as what should not be assessed. At the bottom of the foundations box, you will find articulation of the DCIs across grade levels, beginning with kindergarten and moving through grade 5.

The NGSS Appendixes also provide valuable learning progression information in DCIs, SEPs, CCs, and Nature of Science. You'll find this in Appendix E, Disciplinary Core Ideas Progressions; Appendix F, Science and Engineering Practices; Appendix G, Crosscutting Concepts; and Appendix H, Understanding the Scientific Enterprise.

The NGSS might be the perfect tool for all of us to use in establishing a science learning progression. Of course, in any learning consideration we make, the needs of our specific student population takes highest priority in our deliberations.



Linda Froschauer
Editor, S&C

Reference

National Research Council (NRC). 2013. *Next Generation Science Standards: For states, by states, Volume 2: Appendixes*. Washington DC: National Academies Press.

Editor
Linda Froschauer
Managing Editor
Valynda Mayes
Associate Editor
Stefanie Simmons
Assistant Editor
Kate Lu
Assistant Executive Director, Journals
Kenneth L. Roberts
Internet Editor
Lauren Jonas
Art Director
Will Thomas
Senior Graphic Designer
Joseph Butera
Graphic Designer
Himabindu Bichali
Printing & Production Manager
Catherine Lorrain
Electronic Prepress Technician
Jack Parker
Publisher
David Beacom
Executive Director
David L. Evans
Advertising
Jason Sheldrake
Director
jsheldrake@nsta.org; 703-312-9273



Science & Children (ISSN 0036-8148) is published nine times a year [Sept., Oct., Nov., Dec., Jan., Feb., Mar., Apr./May (combined), and July] by the National Science Teachers Association, 1840 Wilson Blvd., Arlington, VA 22201-3000. Individual membership dues are \$75 (\$50 for publication, \$25 for membership). Memberships outside the United States (except territories), add \$15 per year for postage. Single copy prices for nonmembers, \$10. Periodicals postage paid at Arlington, VA, and additional mailing offices. Publications Mail Agreement no. 41506028. Return undeliverable Canadian addresses to: P.O. Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B 4R6 Canada. ©2015 by the National Science Teachers Association, all rights reserved. Reproduction in whole or part of any article without permission is prohibited.

POSTMASTER: Send address changes to Science & Children, NSTA, 1840 Wilson Blvd., Arlington, VA 22201-3000.