

PRSEF Chemistry Category

Judges' Preferred Bibliographic Resources

Charles B. Greenberg, Ph.D., Category Co-chair

A. About the "Science Enterprise" Generally

1. Krieger, Melanie Jacobs, *How to Excel in Science Competitions, Revised and Updated*, Enslow Publishers, Berkeley Heights, N.J. (1999).
2. Dashefsky, H. Steven, *High School Science Fair Experiments: Environmental Science*, McGraw-Hill, New York (1994). [Senior Chemistry level].
3. Bortz, Fred, *Revolutionary Discoveries of Scientific Pioneers*, 8 volumes, Rosen Publishing Group, New York (2014).
4. Gribbon, John, *The Scientists: A History of Science Told Through the Lives of Its Greatest Inventors*, Random House, New York (2002).
5. Greenberg, Charles, *Scientific Enterprise*, Pittsburgh Legacy Lewis and Clark: <http://www.lc.pitt.edu>, University of Pittsburgh (2002).

B. Intermediate School Chemistry

See Senior Chemistry below too and explore to your grade-appropriate comfort level for each subject. For example, the Encyclopedia Britannica, which is listed as reference #7 for Senior Chemistry, will also often serve Intermediate School Chemistry. So, do not hesitate to browse, and then move on to the next resource.

1. American Chemical Society, *Chemistry for Life™*. <http://www.middleschoolchemistry.com>. [Protons, Neutrons and Elements; Finding Volume; Why Does Water Dissolve Salt?; The Periodic Table; Molecules in Motion]
2. Environmental Protection Agency, *A Students Guide to Global Climate Change*: <http://www.epa.gov/climatechange/kids/index.html>.

3. Gardner, Robert, Tocci, Salvatore, & Rainis, Kenneth G., *Ace Your Chemistry Science Project: Great Science Fair Ideas*, Enslow Publishers, Berkeley Heights, N.J. (2010). [Organized into five chapters: "Chemical Properties," "Acids and Bases," "Temperature," "Volume and Pressure."]
4. Mebane, Robert C. & Rybolt, Thomas R., *Adventures with Atoms and Molecules: Chemistry Experiments for Young People*, Enslow Publishers, Berkeley Heights, N.J. (1998).
5. Mebane, Robert C. & Rybolt, Thomas R., *Everyday Material Science Experiments*, series: *Air & Other Gases; Metals; Plastic & Polymers; Salts & Solids; Water & Other Liquids*, Twenty-First Century Books, New York (1995).
6. Museum of Science & Industry, Chicago, *Online Science, including goReact; Analyze Candy Using Chromatography; See the Colors in Leaves; Create Gas; Make Ice Cream; Make Recycled Paper; Make Slime*: <http://www.msichicago.org/education/educator-resources/classroom-activities/results>.
7. Smithsonian Science Education Center, *Middle School Teaching Resources*: <http://www.ssec.si.edu/ms-teaching-resources>. [Subjects include electricity, energy, optics, properties of matter, weather and climate.]

C. Senior Chemistry (but not excluding Intermediate Level resources)

1. American Museum of Natural History, *Power of Poison*: <http://www.amnh.org/exhibitions/current-exhibitions/the-power-of-poison>.
2. Bourne, Jr., Joel K., *Green Dreams*, National Geographic (October 2007): <http://ngm.nationalgeographic.com/2007/10/biofuels/biofuels-text/1>.
3. Carbon Dioxide Information Analysis Center: <http://cdiac.ornl.gov>.
4. Carnegie-Mellon University/National Science Digital Library (NSDL), *Resources to Teach and Learn Chemistry*: <http://www.chemcollective.org/find.php>. [Subjects include stoichiometry, thermochemistry, kinetics, equilibrium, acid-base chemistry, solubility, oxidation-reduction and electrochemistry, analytical chemistry lab techniques, and physical chemistry.]

5. Carson, Rachel, *Silent Spring*, Houghton Mifflin Harcourt, Boston (2002). [The classic book about how chemical pollutants impact life on earth; free download at https://archive.org/details/fp_Silent_Spring-Rachel_Carson-1962.]
6. Chemical Education Digital Library: <http://www.chemeddl.org>. [Access Periodic Table Live!, Models 360, ChemPRIME and more for searches.]
7. Encyclopedia Britannica, *Chemistry*: <http://www.britannica.com/topic-browse/Science-and-Mathematics/Chemistry>. [Broad coverage; if you are not a subscriber, just ignore the ads, which are the price for free access to the site.]
8. Environmental Protection Agency, *Data and Issues*: <http://www.epa.gov>.
9. Gardner, Robert & Shore, Edward A., *Math & Science in Nature, Finding Patterns in the World Around Us*, Scholastic Library Publishing, New York (1994). [Useful for applying statistical analyses to experimental data.]
10. Gay, Kathlyn, *Water Pollution*, Scholastic Library Publishing, New York (1990).
11. Gay, Kathlyn, *Air Pollution*, Scholastic Library Publishing, New York (1990).
12. Government Science, numerous topics: <http://www.science.gov/index.html>.
13. Kirk-Othmer Encyclopedia of Chemical Technology, 4th (or 5th) Edition, 27 volumes plus K-O Concise Encyclopedia of Chemical Technology, John Wiley & Sons, New York (1991-99). [Excellent resource, but affordable only by major public libraries, universities and corporate libraries. See Carnegie Library of Pittsburgh, University of Pittsburgh Library, or Carnegie-Mellon University Library: free print reference; online with password access.]
14. Miodownik, *Stuff Matters*, Houghton Mifflin Harcourt, Boston (2014). [About various materials such as steel, glass, paper, textiles and more.]
15. National Science Foundation, *Classroom Resources for Chemistry and Materials*: <http://www.nsf.gov/news/classroom>. [Lots and lots of excellent, user-friendly video resources for Intermediate and Senior levels on

Chemistry & Materials, Earth & Environment, Nanoscience and more. A great place to start your bibliographic search.]

16. National Renewable Energy Laboratory, *Alternate Energy and Biofuels*: http://www.nrel.gov/learning/sr_biomass.html.
17. National Science Digital Laboratory: <http://nsdl.org/search/resources>. [Browse the resource categories.]
18. Royal Society of Chemistry, *Learn Chemistry*: <http://www.rsc.org/learn-chemistry/resource>. [Lots of online videos on numerous subjects.]
19. Sandia National Laboratories, *Energy and Climate*: <http://energy.sandia.gov>. [Renewable Systems such as fuel cells and biomass, as well as the Combustion Research Facility, are linked.]
20. Spectroscopy Society of Pittsburgh: <http://www.ssp-pgh.org/educational-software-video>. [Access to instructional videos.]
21. Stwertka, Albert, *A Guide to the Elements, Revised Edition*, Oxford University Press, London, (1998).
22. Woods Hole Oceanographic Institution: *Ocean Chemistry*: <http://www.whoi.edu/main/topic/ocean-chemistry>; *Climate & Ocean*: <http://www.whoi.edu/main/climate-ocean>.