

Sample Materials

5th Grade Physical Science

Classroom Books

A Drop of Water

\$10-15

Amazon.com

<http://www.amazon.com>

by Walter Wick. As you're admiring the "crown" created by a water drop splashing into a pool, or how many water droplets can fit on the head of a pin (the smallest droplet on the pin contains more than three trillion water molecules), you'll learn about evaporation, condensation, snowflakes, how clouds form, and more amazing water tricks. Wick's other artfully composed photographs include a "wild wave" caused by a brown egg dropped in a water glass, soap bubbles with a "shimmering liquid skin," a snowflake

Atoms and Molecules

\$15-20

Amazon.com

http://www.amazon.com/Atoms-Molecules-Projects-Problems-Understanding/dp/0746009887/ref=sr_1_1?s=books&ie=

by Phil Roxbee Cox, P. Roxbee-Cox, Max Parsonage, Andy Burton (Illustrator). Part of the Usborne Understanding Science Series, clear and concise information on atoms and molecules.

BrainJuice: Science, Fresh Squeezed!

\$10-15

Amazon.com

http://www.amazon.com/BrainJuice-Squeezed-Carol-Diggory-Shields/dp/1593540051/ref=sr_1_1?ie=UTF8&qid=14061593540051

This collection of 41 poems is divided into four sections: "Earth and Space Sciences," "Life Sciences," "Chemistry," and "Physics." All of the selections are brief; some are quite clever and others are forced. Some children might find the new words to "The Itsy-Bitsy Spider and the Water Cycle" easy to remember and therefore a help with learning about this process. The same is true of "Inside of Old Smokey," which describes the ins and outs of volcanoes. Related tidbits and facts highlighted by green border

Carbon (The Elements, Group 1)

\$3-4

Amazon.com

http://www.amazon.com/Carbon-Elements-Giles-Sparrow/dp/0761408789/ref=sr_1_1?s=books&ie=UTF8&qid=140597978-0761408789

by Giles Sparrow. Library binding. One of a series of four volumes Carbon is an excellent source of information. This volume is quite complete in presenting the significance of carbon to humans and in nature.

Chemical Chaos

\$6-7

Amazon.com

http://www.amazon.com/Horrible-Science-Chemical-Nick-Arnold-ebook/dp/B00H9FD44I/ref=sr_1_1?ie=UTF8&qid=140597978-0761408789
ASIN: B00H9FD44I

by Nick Arnold, Tony De Saulles (Illustrator). What makes a stink bomb stink? Why aren't glass eyes made of glass? Bubbling over with chaotic chemistry facts, this book also reveals the secrets of some very strange scientists, offers experiments to try at home, and much more.

Chemistry for Every Kid: 101 Easy Experiments that Really Work

\$10-15

Amazon.com

http://www.amazon.com/Janice-VanCleave-Chemistry-Every-Kid/dp/0471620858/ref=sr_1_1?s=books&ie=UTF8&qid=1461111111
ISBN 0471620858

Grades 2-7. Janice VanCleave. This book contains 101 simple, hands-on, low-cost chemistry experiments that have been tested repeatedly-- and really work! The author provides a statement of purpose, materials list, illustrated instructions, and a brief discussion for each experiment. Soft cover.

Eyewitness: Chemistry

\$10-15

Amazon.com

http://www.amazon.com/Eyewitness-Books-Chemistry-Ann-Newmark/dp/075661385X/ref=sr_1_1?s=books&ie=UTF8&qid=1461111111
ISBN: 0789448815

by Ann, Dr Newmark. Explores the world of chemical reactions and shows the role that chemistry plays in our world.

FOSS Science Stories Single Copy Set (English Grades 5-6)

\$50-60

Delta Education

<http://www.delta-education.com/>
542-1302

8 BOOKS, 1 EACH OF 8 TITLES - ENGLISH. Also available in Spanish. Titles reflect the Grade 5-6 FOSS Modules: Mixtures and Solutions, Environments, Food and Nutrition, Levers and Pulleys, Solar Energy, and Landforms.

Materials

\$5-6

Amazon.com

http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=ISBN%200794500854
ISBN 0794500854

by Alastair Smith, Phillip Clarke, Corinne Henderson, Phillip Clark, Verinder Bhachu (Illustrator), Laura Howell, Judy Usborne Internet-Linked Science Encyclopedia Tatchell. Provides information on the various states of matter, the structure and behavior of atoms, and the chemical elements, and recommends related Web sites.

Medicine News (The History News)

\$6-7

Amazon.com

http://www.amazon.com/Medicine-News-history-Philip-Gates/dp/0744578558/ref=sr_1_1?s=books&ie=UTF8&qid=1461111111
ISBN 0763603163

By Gates, Phil. Medicine has come a long way in 10,000 years! Learn all about the astonishing breakthroughs (and blood curdling blunders) made in the process in this riveting story of mankind's never-ending battle against illness and disease. It's not for the squeamish! Full color.

Mixtures & Compounds

\$8-9

Amazon.com

http://www.amazon.com/Mixtures-Compounds-Library-Science-Alastair/dp/079450082X/ref=sr_1_2?ie=UTF8&qid=1461111111
ISBN: 978-0794500825

By Bhachu, Verinder (illustrator); Clark, Phillip; Clarke, Phillip; Henderson, Corinne; Howell, Laura; Smith, Alastair; Tatchell, Judy Usborne Internet-Linked Science Encyclopedia. Provides information on how the chemical elements form compounds and how different kinds of compounds behave and interact, and recommends related Web sites. 64 pages.

Mr. Wizard's Supermarket Science

FREE

Alameda County Public Libraries

<http://alam1.aclibrary.org/search~S30?/tmr+wizard/tmr+wizard/1%2C6%2C6%2CB/frameset&FF=tmr+wizards+supern>
J507.8 HERBERT

A supermarket of interesting science-related devices, stunts, and puzzles to make from items found at a grocery store. More than 100 projects, all simple enough for middle-graders. The essentials--ideas based on curiosity and creativity, clear instructions, and explanations of why the projects work--are all here.

Powers of ten : a book about the relative size of things in the universe and th

FREE

Alameda County Public Libraries

<http://alam1.aclibrary.org/search~S30?/aMorrison%2C+Philip/amorrison+philip/-3,-1,0,B/browse>
523.1 MORRISON

Out of print. Powers of Ten (1982) by Philip & Phylis Morrison and The Office of Charles and Ray Eames. This is a wonderful and elegant book version of the classic film.

Science Experiments You Can Eat (Vicki Cobb)

\$6-7

Berkeley Public Library

<http://www.infopeople.org/bpl/>
507C634S

Activities with foods you can eat. Same author writes More Science Experiments You Can Eat

The Magic School Bus Gets Baked in a Cake: A Book About Kitchen Chemis

\$3-4

Amazon.com

http://www.amazon.com/Magic-School-Gets-Baked-Cake/dp/0590222953/ref=sr_1_1?s=books&ie=UTF8&qid=140597
ISBN: 978-0590222952

When the class tries to bake a cake for Ms. Frizzle's birthday, they wind up inside it and have some delicious fun learning all about mixtures and reactions that occur when ingredients are combined.

Two Bad Ants

\$10-15

Amazon.com

http://www.amazon.com/Two-Bad-Ants-Chris-Allsburg/dp/0395486688/ref=sr_1_1?s=books&ie=UTF8&qid=14069187
ISBN: 0395486688

by Chris Van Allsburg. Grades preschool-4. This beautifully illustrated abook about two ants in search of sugar provides opportunities to further discuss a liquid as something that flows, and to see that some substances, such as sugar, which also flow or pour, are in fact made up of tiny crystal solids. In this brief tale of the adventures of two runaway ants, Van Allsburg once again gives children a visual puzzle to solvein this case identifying common household appliances from an ant's point of view. When a troop of ants are sent to retrieve sugar crystals from a kitchen, two ants stay behind to feast and go to sleep in the sugar bowl. When morning comes they are successively stirred into a cup of coffee, almost swallowed, toasted with an english muffin, whirled through a garbage disposal, and stunned senseless in an electrical outlet. While some children will enjoy identifying the highly magnified objects, others will wonder how the ants have managed to survive any one of these disasters. The truants return home in one piece, and the last few lines supply a pallid and oddly moralistic conclusion to the story.

You Are Stardust

\$10-15

Owlkids Books

<http://www.owlkidsbooks.com/YouAreStardust.aspx>

Website has an app for ipad and lesson plans. You Are Stardust begins by introducing the idea that every tiny atom in our bodies came from a star that exploded long before we were born. From its opening pages, the book suggests that we are intimately connected to the natural world; it compares the way we learn to speak to the way baby birds learn to sing, and the growth of human bodies to the growth of forests. Award-winning author Elin Kelsey — along with a number of concerned parents and educators around the world — believes children are losing touch with nature.

Kits & Modules

Orbit Molecular Models Kit

\$50-60

Carolina Biological

<http://www.carolina.com>

840222

For 12-24 students. Students construct models that illustrate the molecular structure of such common substances as water, carbon dioxide, and ammonia. A good introduction to chemical formulas. Approximate atom center diameters, 9 mm. Includes 24 carbon centers, 24 nitrogen centers, 72 chlorine centers, 48 oxygen centers, 12 sulfur centers, 96 hydrogen centers, 240 bonds, student and teacher instructions.

The Fizz Wizard and Jammin' Jelly Reaction Kit

\$50-60

Carolina Biological

<http://www.carolina.com>

840449

Classroom Kit. Students make soda fizz, create tasty jelly, and formulate their own carbonated drinks using the materials in this fun kit. Students learn how food chemists make their favorite snacks using acid-base chemistry, pH, and polymers. Recipes for making polymer pudding desserts at home are included. All reaction products in this kit are edible. Complete with instruction booklet and MSDS. The classroom kit is for 3 classes of 30 students (working in pairs). The demonstration kit (TA-840448) is for demonstrations.

Watershed Field Trip

\$60-70

Acorn Naturalists

<http://www.acornnaturalists.com/store/WATERSHED-FIELD-TRIP-KIT-P341C0.aspx>

KIT-9319

Complete kit for students in grades 1-5. Teacher's manual provides guidelines for taking field trips, conducting water quality tests and collecting and interpreting data. Includes tests for pH, nitrate, phosphate and dissolved oxygen using simple TesTabs. Includes all necessary tests and accessories for up to 30 students. An excellent way to introduce students to the chemistry of watershed protection.

Posters/Pictures/Slides

Carolina Chemistry Reference Chart - 10 pack

\$10-15

Carolina Biological

<http://www.carolina.com>

RG-84-0060

8.5 x 11". A 2-sided chart that puts the fundamentals of chemistry right at your fingertips. Printed on heavy-stock paper for durability. Chart includes these topics and tables: Concentrated Acids and Bases, Flame Tests, Numeric Notation, Periodic Table of the Elements with Electronic Configurations and Oxidation States, Physical Constants and Conversion Factors, 11 x 8 1/2". A 2-sided chart puts the fundamentals of chemistry right at your fingertips. Printed on heavy-stock paper for durability. Chart inclu

Periodic Table - poster size

\$30-35

Edmund Scientific

<http://www.scientificsonline.com/>

3107900

Wall Chart, Laminated Periodic Table Reference Chart 106 cm x 147 cm, 58" x 42"

- Periodic Table of Elements** \$35-40
 Carolina Biological
<http://www.carolina.com>
 57-9615
 50 1/2 × 29 3/4". A full-color photograph of each element is accompanied by brief descriptive text. Atomic number, relative atomic mass, and the number of electrons in each electron shell are given. Three different notations are used: IUPAC-recommended group notation until 1985; Chemical Abstracts Service Group notation used until 1986; and IUPAC-recommended group notation after 1986.
- Periodic Table Poster** \$10-15
 Edmund Scientific
<http://www.scientificsonline.com/>
 3053431
 Each element is pictured either in a raw state or in a form that is easily recognizable and easy to memorize. Comes in paper or long-lasting plastic laminate versions. Each measures 25" x 38". Also available laminated for 21.95 item # 3053432
- Powers of 10 Poster** \$10-15
 Powersof10.com
<http://www.powersof10.com>
 PTL-01
 This 27 inch by 27 inch Powers of Ten Poster is now available from the Eames Office. This beautiful poster features the images from the classic film (and later used in the Powers of Ten book). The poster shows all the powers of ten from the scale of the quark (10^{-18}) to the edge of the known universe (10^{+25}). The website offers interactive activities.
- The Carbon Cycle Poster** FREE
 The Forest Foundation
<http://www.calforests.org/foundation>
 This poster graphically demonstrates the cycle of carbon absorption, storage and release into the atmosphere. Included are visuals that explain the role of sustainable forestry, wood products and wildfires. Size 19" X 25" Can also download a PDF online
-
- Teacher Guide/Reference/Curriculum**
-
- Chemistry Matters** \$20-25
 AIMS Education Foundation
<http://www.aimsedu.org/item/p-1217/chemistry-matters-5-7/1.html>
 1217
 26 activities - 260 pages
 This hands-on exploration of chemistry uses meaningful, engaging contexts to give your students a better understanding of basic chemistry concepts. Activities are organized into five sections: properties of matter, changes in matter, conservation of matter, reactions in matter, and organization of matter.
- GEMS Crime Lab Chemistry** \$15-20
 Lawrence Hall of Science
lawrencehallofscience.org
 0-924886-34-X

Poirot never had it this good. In this unit's prime scenario, pegging the pen used to write a ransom note comes down to chromatography, a technique for separating mixtures into their (telling) component parts. Challenged to determine which of several black pens was used to write the ransom note, student-detectives explore the concepts of solubility, pigments, and separation of mixtures as they use chromatography to ferret out the culprit. Ink is one of many substances for which the technique is used in science; the separation of blood and other constituents has become invaluable in real-world forensic science and students' fascination with detective work makes a terrific springboard for further discussion. Several mystery scenarios are possible, using nefarious characters drawn from any context you like; many teachers have cast themselves or the school principal as suspects! Grades 4-8.

GEMS Of Cabbages and Chemistry

\$10-15

Lawrence Hall of Science

lawrencehallofscience.org

0-924886-28-5

The humble cabbage has noble chemical merit. The juice from red cabbage turns pink when mixed with an acid, turns green when mixed with a base, and remains purple when mixed with a neutral substance. What a chemical canvas! In this series of engaging activities, students use the special indicator properties of red cabbage juice to investigate acids and bases. Rather than starting with standard definitions, this unit plunges children into experiments through which they discover for themselves the distinction between the two, and their relationship to neutral." The "Presto Change-O" activity reveals that acids and bases are parts of a continuum. Students also learn that chemicals can be grouped by behaviors

Tools/Equipment

Bromthymol Blue

\$6-7

Carolina Biological

<http://www.carolina.com>

849165

500 mL of 0.04% aqueous (in liquid) BTB. Bromthymol Blue is a carbon dioxide indicator and can be used in experiments observing photosynthesis. Ask CRS for a copy of the activity!

Litmus Paper

\$1-2

American Science & Surplus

<http://www.sciplus.com/>

88219

Chemically treated paper strips to test for acid or base (alkaline) solutions. Use the Blue Litmus Paper (#88217, \$1.90/2 vials) for acidity tests, the Red Litmus Paper (#88218, \$1.90/2 vials) for alkalinity. The more sophisticated Hydrion paper strip indicates pH from 1 (dark red) to 11 (dark blue). Values in between can be read by comparing with a color chart on the side of the container. All have 100 strips of test paper per vial.

Safety Goggles Rainbow Pack - Set of 6

\$15-20

Lakeshore Learning Store

<http://www.lakeshorelearning.com>

FS383

These flexible plastic goggles are perfect for kids with ventilation holes on top and bottom, plus a stretchy strap in back that adjusts for a perfect fit. You get 6 pairs in 3 colors; each is 6".

FS383

Student Safety Goggles - set of 12

\$25-30

Lakeshore Learning Store

<http://www.lakeshorelearning.com>

LA216

Our flexible plastic goggles adjust to give students a perfect fit.

Video

Bill Nye: Atoms

\$35-40

Disney Education Products

<http://www.edustation.disney.com>

68E36VL00

What's the "big deal" about atoms? They're too small for our eyes to see, so what good are they? See how atoms combine to form molecules in this fascinating program.

Bill Nye: Atoms DVD

\$45-50

Disney Education Products

<http://www.edustation.disney.com>

77A02VL00

In "Atoms," Bill Nye explains how atoms combine to form molecules and that even though they're too small to see with our eyes, they are the building blocks of all matter.

In addition to the complete 26-minute episode of "Atoms," this disk is loaded with incredible DVD features like:

- *Fully indexed "chapters" correlated to National Science Standards.
- *Interactive glossaries and quizzes.
- *Bonus footage of never-before-seen segments, interviews, and demos.
- *Spanish translation and closed-captioning.

Bill Nye: Chemical Reactions

\$35-40

Disney Education Products

<http://www.edustation.disney.com>

68A83VL00

26 minutes. Have a blast watching the explosive examples Bill Nye uses to explain that everything is made of chemicals. Guest star Candace Cameron ("Full House") shares the lab with Bill and shows that fire is actually a chemical reaction. Together, they extinguish a "tornado of fire."

Bill Nye: Chemical Reactions DVD

\$45-50

Disney Education Products

<http://www.edustation.disney.com>

77A07VL00

You'll have a blast watching the explosive examples Bill Nye uses to explain that everything is made of chemicals. Guest star Candace Cameron shares the lab with Bill and shows that fire is actually a chemical reaction. In addition to the complete 26-minute episode of "Chemical Reactions," this disk is loaded with incredible DVD features like:

- *Fully indexed "chapters" correlated to National Science Standards.
- *Interactive glossaries and quizzes.
- *Bonus footage of never-before-seen segments, interviews, a

Chemistry Matters

\$35-40

Disney Education Products

<http://www.edustation.disney.com>

68912

Join the 5th grade class of Fran Barhydt (three-time winner of the National Science Teacher of the Year Award) for a lesson on mixtures and solutions. This documentary presents interesting and easy experiments for any classroom to demonstrate the properties of mixtures and solutions, using common substances such as cornstarch, sugar cubes, gum balls, dry soup, and vinegar. Students learn how to use the scientific process and safe lab procedures. 17 minutes.

NOVA Kaboom!

\$90-100

Amazon.com

NOVA kaboom

ASIN: 6304462948

Grade 4-College. Experience the ultimate chemical reaction-- the explosion. With high-speed photography and dramatic reconstructions, NOVA examines the history of explosives and their role in accidents, war, and terrorism. 60 minutes.

Powers of 10 Video

\$35-40

Powersof10.com

<http://www.powersof10.com>

HVN-01

Undoubtedly the most famous of the Eames Films, Powers of Ten is probably one of the most seen short films of the post-war era. Volume 1 also includes Rough Sketch - - the first version, made 9 years earlier. The volume includes A Rough Sketch. 21 minutes. The website offers interactive activities.

Understanding Atoms and Molecules (2002)

\$50-60

Amazon.com

http://www.amazon.com/Understanding-Atoms-and-Molecules-VHS/dp/1589500512/ref=sr_1_1?ie=UTF8&qid=140597

ASIN: 1589500512

Atoms and molecules are the basic foundation of everything that exists. An atom is the smallest unit of matter that is recognizable as a chemical element, but atoms themselves may be broken up into smaller parts. Become acquainted with the inner structure of an atom and understand how each part of the atom has an essential function. Learn that molecules are groups of atoms that are held together by amazing chemical bonds. How these chemical bonds are formed will be explored, as students get a solid introduction to the building blocks of all matter.