Below are a number of the experiments we conducted with links. The books we used follow.

***Discrepant events:***

* Burning $100 bill – alcohol, water, tongs, flame retardant material, lighter
* Coke Floats – large, clear container, variety of sodas
* Discrepant event ideas and lessons: <https://sites.google.com/site/whelmersmcrel/>

***Physics (physical science):***

* Bernoulli’s principle:
	+ Toilet paper and leaf blower
	+ Wind bag <https://www.stevespanglerscience.com/lab/experiments/bernoullis-windbags/>
	+ Straws and empty soda cans: <https://sites.google.com/site/whelmersmcrel/12-bernoulli-cans>
* Colliding spheres <http://www.arborsci.com/detail.aspx?ID=578>
* Astro blaster (rubber ball blaster) <http://www.arborsci.com/astro-blaster>
* Magnetic accelerator <http://www.arborsci.com/magnetic-accelerator>
* Rockets: educator bulk packs: <http://www.estesrockets.com/rockets/educator>
* CO2 Cars: <http://www.acsupplyco.com/dragsters/dragsters.htm>
* Radar gun: <http://www.enasco.com/product/SB44701E>
* Ballistics car: <http://www.arborsci.com/prod-Ballistics_Car-1419.aspx>
* Inertia apparatus: <http://www.arborsci.com/prod-Inertia_Apparatus-1304.aspx>

***Chemistry (physical science):***

* Density cubes: <https://www.enasco.com/product/SB44474M>
* Galileo thermometers: <http://www.arborsci.com/prod-Galileos_Thermometer_Fahrenheit-946.aspx>
* Ball and ring: <https://www.enasco.com/product/SB07985>
* Aluminum boats (good experiment w/ buoyancy and density): aluminum foil, containers for water, 1” washers
* Phantom crystals: <http://www.arborsci.com/prod-Phantom_Crystals-549.aspx>
* Insta-snow: <http://www.stevespanglerscience.com/category/instant-snow>
* Hydrophobic sand: <http://www.stevespanglerscience.com/product/1331>
* Mentos and Diet Coke - geyser tube and depth charge: <https://www.stevespanglerscience.com/store/mentos-geyser-tube-event-packs.html>
* Dry ice: Ultra Foods - 501 S County Farm Rd Wheaton, IL 60187

***Colloids:***

* Elmer’s glitter glue – [http://www.amazon.com/Elmers-6-Ounces-Washable-Glitter-Glue/dp/B008M56Z04/ref=sr\_1\_3?ie=UTF8&qid=1364843934&sr=8-3&keywords=elmer%27s+glitter+glue](http://www.amazon.com/Elmers-6-Ounces-Washable-Glitter-Glue/dp/B008M56Z04/ref%3Dsr_1_3?ie=UTF8&qid=1364843934&sr=8-3&keywords=elmer%27s+glitter+glue)
* Sodium Tetraborate – Borax – at Walmart
* Lined cups – available at most stores
* Popsicle sticks
* Baggies
	+ 1 tablespoon Borax per cup of water in solution
	+ mix half glue, half water, - STIR
	+ 5mL of Borax solution at a time
	+ Don’t over-Borax! (probably need about 15 mL of solution for about 5 oz of colloid)

***Ice Cream / Slushies:***

* Gallon and quart-sized FREEZER bags
* Ice
* ½ cup table salt for every two students
* Ice cream or beverage in the quart-sized bag – seal with as much air out of the bag as possible
* Ice and salt in gallon-sized freezer bag – quart-sized bag in size – squeeze with ice in exterior bag
* Ice cream mixture – Gallon of whole milk (pour out enough to put 1.5 to 2 cups of sugar) add vanilla or chocolate to taste

***Earth science:***

***Rocks and minerals:***

* <http://www.etacuisenaire.com/catalog/product?deptId=&prodId=21140&q=Rocks+and+mineral+sets>
* Fog machine: <http://www.arborsci.com/SearchResult.aspx?KeyWords=fog%20machine>
* Water Olympics: Project Wet: <http://www.projectwet.org/>
* Cookie mining: variety of chocolate chip cookies, graph paper, paperclips, and toothpicks – good for mining/conservation discussions
* Relative distance from space: <http://micro.magnet.fsu.edu/primer/java/scienceopticsu/powersof10/>

***Life science:***

* Owl pellets (good for predator/prey relationships): <https://www.enasco.com/t/-owl-pellets/Elementary-Education>
* Smoker’s lung: <https://www.enasco.com/q?question=simulated+lungs&x=0&y=0>
* Decalcified eggs: vinegar and non-boiled eggs – good for osmosis and diffusion – cell membrane
* Digestive demo:
* *Objective:* Students will describe the processes and parts of the digestive system using appropriate vocabulary.
* *Materials:*
	+ - Left over foods to constitute “3 meals”
		- Blender
		- Bag labeled small intestines
		- Beakers – one with green water – amylase (enzyme in saliva – breaks down carbs), red water – hydrochloric acid, and yellow water (bile)
		- Nylon hose
		- Basin
		- Scissors
* *Procedure:*
	+ - Label parts with one color and processes with another
		- Where does digestion begin?
		- Mouth – mastication
		- Salivary glands – enzyme – amylase
		- Place breakfast in blender with amylase – masticate
		- Move food to esophagus – peristalsis
		- Stomach – add hydrochloric acid and bile – churn
		- After 4 hours – move to small intestine (baggie)
		- Lunch – repeat process
		- Discuss small intestine – approximately 21 feet in adults (15 feet in 10 year-olds) – composed of villi – remove nutrients
		- Dinner – repeat process
		- Large intestines – discuss – 3 feet, removes water – diarrhea occurs when not functioning properly
		- Pour into nylon hose over basin – have student simulate peristalsis, another student cut an anus in the nylon
		- Total process takes 18-24 hours on average

***General science supplies:***

* Goggles: <https://www.enasco.com/q?question=safety+goggles&x=0&y=0>
* Beakers: <https://www.enasco.com/q?question=beakers&x=0&y=0>
* Graduated cylinders: <https://www.enasco.com/q?question=graduated+cylinders&x=0&y=0>
* Scales: <https://www.enasco.com/t/-scales/Elementary-Education>
* Magnetic stirrer: <https://www.enasco.com/q?question=magnetic+stirrer&x=0&y=0>
* Pipettes: <https://www.enasco.com/q?question=pipette&x=0&y=0>

***Books:***

***Primary***

[**Sisters and Brothers: Sibling Relationships in the Animal World**](http://www.amazon.com/Sisters-Brothers-Sibling-Relationships-Animal/dp/0618375961/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258999410&sr=1-1)by [Robin Page](http://www.amazon.com/Robin-Page/e/B001H6RR4I/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258999410&sr=1-1) and [Steve Jenkins](http://www.amazon.com/Steve-Jenkins/e/B001H6O27S/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258999410&sr=1-1) (**Hardcover** - April 14, 2008)

[http://www.amazon.com/Sisters-Brothers-Sibling-Relationships-Animal/dp/0618375961/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258999410&sr=1-1](http://www.amazon.com/Sisters-Brothers-Sibling-Relationships-Animal/dp/0618375961/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258999410&sr=1-1)

[**Eggs**](http://www.amazon.com/Eggs-Marilyn-Singer/dp/0823417271/ref%3Dsr_1_4?ie=UTF8&s=books&qid=1258999787&sr=1-4)by Marilyn Singer and Emma Stevenson (**Hardcover** - Mar 15, 2008

[http://www.amazon.com/Eggs-Marilyn-Singer/dp/0823417271/ref=sr\_1\_4?ie=UTF8&s=books&qid=1258999787&sr=1-4](http://www.amazon.com/Eggs-Marilyn-Singer/dp/0823417271/ref%3Dsr_1_4?ie=UTF8&s=books&qid=1258999787&sr=1-4)

[**The Wolves Are Back**](http://www.amazon.com/Wolves-Back-Jean-Craighead-George/dp/0525479473/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259008825&sr=1-1)by [Jean Craighead George](http://www.amazon.com/Jean-Craighead-George/e/B000AQ1OBS/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259008825&sr=1-1) and Wendell Minor (**Hardcover** - April 17, 2008)

[http://www.amazon.com/Wolves-Back-Jean-Craighead-George/dp/0525479473/ref=sr\_1\_1?ie=UTF8&s=books&qid=1259008861&sr=1-1](http://www.amazon.com/Wolves-Back-Jean-Craighead-George/dp/0525479473/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259008861&sr=1-1)

[**What's Eating You?: Parasites -- The Inside Story**](http://www.amazon.com/Whats-Eating-You-Parasites-Inside/dp/0763645214/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259008958&sr=1-1)by [Nicola Davies](http://www.amazon.com/Nicola-Davies/e/B001IQWM1A/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259008958&sr=1-1) and Neal Layton (**Paperback** - Aug 11, 2009)

[http://www.amazon.com/s/ref=nb\_ss\_2\_17?url=search-alias%3Dstripbooks&field-keywords=what%27s+eating+you+parasites--the+inside+story&sprefix=What%27s+eating+you](http://www.amazon.com/s/ref%3Dnb_ss_2_17?url=search-alias%3Dstripbooks&field-keywords=what%27s+eating+you+parasites--the+inside+story&sprefix=What%27s+eating+you)

(WINNER – METHODS 2010) [**Where in the Wild?: Camouflaged Creatures Concealed... and Revealed**](http://www.amazon.com/Where-Wild-Camouflaged-Creatures-Concealed/dp/1582462070/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258997855&sr=8-1)by David Schwartz, Yael Schy, and Dwight Kuhn (**Hardcover** - Sep 1, 2007)

[http://www.amazon.com/Where-Wild-Camouflaged-Creatures-Concealed/dp/1582462070/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258997855&sr=8-1](http://www.amazon.com/Where-Wild-Camouflaged-Creatures-Concealed/dp/1582462070/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258997855&sr=8-1)

[**Vulture View**](http://www.amazon.com/Vulture-View-April-Pulley-Sayre/dp/0805075577/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259010418&sr=1-1)by [April Pulley Sayre](http://www.amazon.com/April-Pulley-Sayre/e/B001ITYUVW/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259010418&sr=1-1) and Steve Jenkins (**Hardcover** - Oct 2, 2007)

<http://www.amazon.com/exec/obidos/ASIN/0805075577/sciencebooksfilm/103-9966551-6338213>

***Intermediate***

[**Tracking Trash: Flotsam, Jetsam, and the Science of Ocean Motion (Scientists in the Field Series)**](http://www.amazon.com/Tracking-Trash-Flotsam-Science-Scientists/dp/0618581316/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258997778&sr=1-1)by [Loree Griffin Burns](http://www.amazon.com/Loree-Griffin-Burns/e/B001ILIGQU/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258997778&sr=1-1) (**Hardcover** - Mar 26, 2007)

[http://www.amazon.com/Tracking-Trash-Flotsam-Science-Scientists/dp/0618581316/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258997778&sr=1-1](http://www.amazon.com/Tracking-Trash-Flotsam-Science-Scientists/dp/0618581316/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258997778&sr=1-1)

[**Where Else in the Wild?**](http://www.amazon.com/Where-Else-Wild-David-Schwartz/dp/1582462836/ref%3Dsr_1_2?ie=UTF8&s=books&qid=1258998571&sr=8-2)by [David M. Schwartz](http://www.amazon.com/David-M.-Schwartz/e/B000APFLNQ/ref%3Dsr_ntt_srch_lnk_2?_encoding=UTF8&qid=1258998571&sr=8-2), Yael Schy, and Dwight Kuhn (**Hardcover** - Sep 8, 2009)

[http://www.amazon.com/Where-Else-Wild-David-Schwartz/dp/1582462836/ref=sr\_1\_2?ie=UTF8&s=books&qid=1258998571&sr=8-2](http://www.amazon.com/Where-Else-Wild-David-Schwartz/dp/1582462836/ref%3Dsr_1_2?ie=UTF8&s=books&qid=1258998571&sr=8-2)

[**Dinosaur Eggs Discovered: Unscrambling the Clues**](http://www.amazon.com/Dinosaur-Eggs-Discovered-Unscrambling-Clues/dp/0822567911/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258998679&sr=8-1)by [Lowell Dingus](http://www.amazon.com/Lowell-Dingus/e/B001IZXAVC/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258998679&sr=8-1), Rodolfo A. Coria, Luis M. Chiappe, and Stephanie Abramowicz (**Library Binding** - Sep 2007)

[http://www.amazon.com/Dinosaur-Eggs-Discovered-Unscrambling-Clues/dp/0822567911/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258998679&sr=8-1](http://www.amazon.com/Dinosaur-Eggs-Discovered-Unscrambling-Clues/dp/0822567911/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258998679&sr=8-1)

[**Q Is for Quark: A Science Alphabet Book**](http://www.amazon.com/Q-Quark-Science-Alphabet-Book/dp/1582463034/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258998841&sr=1-1)by [David M. Schwartz](http://www.amazon.com/David-M.-Schwartz/e/B000APFLNQ/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258998841&sr=1-1) and Kim Doner (**Paperback** - Oct 13, 2009)

[http://www.amazon.com/Q-Quark-Science-Alphabet-Book/dp/1582463034/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258998841&sr=1-1](http://www.amazon.com/Q-Quark-Science-Alphabet-Book/dp/1582463034/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258998841&sr=1-1)

[**How We Know What We Know About Our Changing Climate: Scientists and Kids Explore Global Warming (About Our Changing Climate)**](http://www.amazon.com/Know-What-About-Changing-Climate/dp/1584691034/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258999514&sr=1-1)by [Lynne Cherry](http://www.amazon.com/Lynne-Cherry/e/B001IO9UPI/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258999514&sr=1-1) and Gary Braasch (**Hardcover** - Mar 3, 2008)

[http://www.amazon.com/Know-What-About-Changing-Climate/dp/1584691034/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258999514&sr=1-1](http://www.amazon.com/Know-What-About-Changing-Climate/dp/1584691034/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258999514&sr=1-1)

[**Circulating Life: Blood Transfusion from Ancient Superstition to Modern Medicine (Discovery!)**](http://www.amazon.com/Circulating-Life-Transfusion-Superstition-Discovery/dp/0822566060/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259010551&sr=1-1)by [Cherie Winner](http://www.amazon.com/Cherie-Winner/e/B001JRXWTO/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259010551&sr=1-1) (**Library Binding** - April 2007)

<http://www.amazon.com/exec/obidos/ASIN/0822566060/sciencebooksfilm/103-9966551-6338213>

[**Oh Rats! The Story of Rats and People**](http://www.amazon.com/Oh-Rats-Story-People/dp/B002N2XIC0/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259009744&sr=1-1)by [Albert Marrin](http://www.amazon.com/Albert-Marrin/e/B001H6PVE6/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259009744&sr=1-1) and C. B. Mordan (**Hardcover** - Aug 17, 2006)

[http://www.amazon.com/s/ref=nb\_ss\_0\_8?url=search-alias%3Dstripbooks&field-keywords=oh+rats+the+story+of+rats+and+people&sprefix=Oh%2C+Rats](http://www.amazon.com/s/ref%3Dnb_ss_0_8?url=search-alias%3Dstripbooks&field-keywords=oh+rats+the+story+of+rats+and+people&sprefix=Oh%2C+Rats)

[**Team Moon: How 400,000 People Landed Apollo 11 on the Moon (Outstanding Science Trade Books for Students K-12 (Awards))**](http://www.amazon.com/Team-Moon-Outstanding-Science-Students/dp/0618507574/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259009854&sr=1-1)by [Catherine Thimmesh](http://www.amazon.com/Catherine-Thimmesh/e/B001ILMEM2/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259009854&sr=1-1) (**Hardcover** - Jun 26, 2006)

[http://www.amazon.com/Team-Moon-Outstanding-Science-Students/dp/0618507574/ref=sr\_1\_1?ie=UTF8&s=books&qid=1259009854&sr=1-1](http://www.amazon.com/Team-Moon-Outstanding-Science-Students/dp/0618507574/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259009854&sr=1-1)

[**Cold Light: Creatures, Discoveries, and Inventions That Glow**](http://www.amazon.com/Cold-Light-Creatures-Discoveries-Inventions/dp/1590784685/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259009067&sr=1-1)by [Anita Sitarski](http://www.amazon.com/Anita-Sitarski/e/B001JPCSKK/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1259009067&sr=1-1) (**Hardcover** - Oct 2007)

[http://www.amazon.com/Cold-Light-Creatures-Discoveries-Inventions/dp/1590784685/ref=sr\_1\_1?ie=UTF8&s=books&qid=1259009067&sr=1-1](http://www.amazon.com/Cold-Light-Creatures-Discoveries-Inventions/dp/1590784685/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1259009067&sr=1-1)

[**A Drop Of Water**](http://www.amazon.com/Drop-Water-Walter-Wick/dp/0590221973/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1269878047&sr=1-1)by [Walter Wick](http://www.amazon.com/Walter-Wick/e/B000APB3T2/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1269878047&sr=1-1) (**Hardcover** - Apr. 1, 1997)

 [https://www.amazon.com/Drop-Water-Book-Science-Wonder/dp/0590221973/ref=sr\_1\_1?s=books&ie=UTF8&qid=1491318401&sr=1-1&keywords=A+drop+of+water](https://www.amazon.com/Drop-Water-Book-Science-Wonder/dp/0590221973/ref%3Dsr_1_1?s=books&ie=UTF8&qid=1491318401&sr=1-1&keywords=A+drop+of+water)

***Young Adult***

[**Welcome to Your Brain: Why You Lose Your Car Keys but Never Forget How to Drive and Other Puzzles of Everyday Life**](http://www.amazon.com/Welcome-Your-Brain-Puzzles-Everyday/dp/1596915234/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258999637&sr=1-1)by [Sam Wang](http://www.amazon.com/Sam-Wang/e/B001JP0Z5K/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258999637&sr=1-1) and [Sandra Aamodt](http://www.amazon.com/Sandra-Aamodt/e/B001JPBYRS/ref%3Dsr_ntt_srch_lnk_1?_encoding=UTF8&qid=1258999637&sr=1-1) (**Paperback** - Dec 23, 2008)

[http://www.amazon.com/Welcome-Your-Brain-Puzzles-Everyday/dp/1596915234/ref=sr\_1\_1?ie=UTF8&s=books&qid=1258999637&sr=1-1](http://www.amazon.com/Welcome-Your-Brain-Puzzles-Everyday/dp/1596915234/ref%3Dsr_1_1?ie=UTF8&s=books&qid=1258999637&sr=1-1)

***Great Resource for Demonstrations and Experiments***

Spangler, S. (2010). *Naked eggs and flying potatoes: Unforgettable experiments that make science fun.* Austin, TX: Greenleaf Book Group Press.

Spangler, S. (2012). *Fire bubbles and exploding toothpaste: More unforgettable experiments that make science fun.* Austin, TX” Greenleaf Book Group Press.

Gray, T. (2009). *Theo Gray’s mad science: Experiments you can do at home – but probably shouldn’t.*  New York, NY: Black Dog & Leventhal Publishers.

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<http://www.k8science.org/>