IEEE Science Kits for Public Libraries Grant

Sample Science Kit Descriptions

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Science Kits Background Information

The following kit descriptions are based on the science kits created by the Mount Prospect Public Library (MPPL) in Mount Prospect, IL. Most of the information contained in this guide was compiled by youth services librarians at MPPL. Funding for the MPPL kits was provided by IEEE - Chicago Section.

MPPL created seven kits, including:

- Energy Lab
- Van de Graaff Generator
- Straw Rocket Launcher
- Snap Circuits
- Electronics Projects Lab
- Early Structures
- Early Simple Machines

Each kit comes with information and equipment to perform science activities. Kits are limited to MPPL cardholders and circulate for three weeks with holds and renewals allowed. Each kit includes a binder of background information and/or instructions for experiments. Each binder also includes a note which designates IEEE-Chicago Section as the grant provider funding the kit.

Some of the kits include parts that periodically need to be replenished; the library covers the costs of these parts and materials. For example, the straw rocket launcher kit comes with straws and note cards that the library provides.

In creating the kits, MPPL youth services librarians worked collaboratively with the technical services department to catalog and process the kits. Each kit has its own catalog record; links to records for the MPPL kits can be found in Appendix D. The technical services department did most of the packaging, but the youth services department had input on containers and other choices in packaging material.

Straw Rocket Launcher

Description from Lego Education:

Students can build their own straw rockets and test them on the *Straw Rocket Launcher*. Just like early rocket pioneer Robert Goddard, they can conduct scientific experiments by varying the trajectory angle and launch energy. These rockets can travel up to 50 feet!

The *Straw Rocket Launcher* uses pneumatic force created by releasing a weighted drop rod in the cylinder to launch rockets. The force of the launch can be controlled by varying the release height of the rod. The launcher features:

- Adjustable trajectory angle with angle gauge
- Clear tube, which displays internal parts
- Adjustable launch force
- Simple operation

Building straw rockets is a fun, inexpensive activity and a great way to introduce students to rocketry. Use with *Precision Straws*, sold separately. Recommended for use in a large, open indoor area, such as a gymnasium.

Contents of this kit:
Straw rocket launcher (purchased from Lego Education, $169.00)
Straws
Klean Klay (modeling clay)
Note cards
1 binder

Included in the binder:
User Guide
Student Instructions
Soaring Straws Lab
(http://mrzimmerman.org/New%20Folder/LabPage/zim.com%20labs/lab_soaring_straw.pdf)
Reproducible Investigation Log (Appendix E)
Helpful Science Websites (Appendix A)
Teacher's Guide (purchased from Lego Education, $24.95)

Early Structures

Description from Lego Education:

Students learn basic structures concepts with hands-on exploration! Concepts include balance within structures, ways of building structures, and stability. By building a variety of models, children can determine the best shape for the job. It's ideal for developing design and problem-solving skills. The set is designed for use by teams of two to three children. In addition to the elements, it includes teacher notes with support for 16 activities, 14 investigation and problem-solving cards, and an inventory list.

Contents of this kit:
Early structures Lego pack (purchased from Lego Education, $96.95)
1 binder
Story Starters book (purchased from Lego Education, $29.95)

"Stories are a great way to excite and motivate young children. This 24-page book from LEGO® Education serves as a series of story starters to promote the creative, social, and expressive skills of kids while using LEGO Education DUPLO® sets. The *Story Starters* feature 16 activities with challenges and questions that trigger children's imaginations and help them build problem-solving and critical-thinking skills. For ages 3-6."

Included in the binder:
Notes for the Teacher (included in the set purchased from Lego)
Building Bridges Activity (http://www.galaxy.net/~k12/structure/bridge.shtml)
Reproducible Investigation Log (Appendix E)
Helpful Science Websites (Appendix A)
Activity Cards (included in the set purchased from Lego)

Early Simple Machines

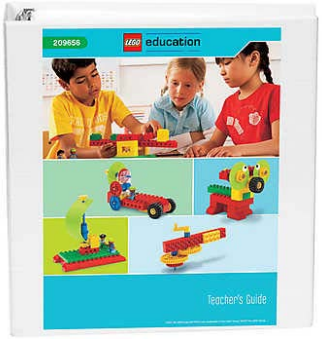
Description from Lego Education:

With this updated version of the *Early Simple Machines Set*, young students build fun and simple models like a seesaw, rolling vehicle, spinning top, raft, and many more. By playing with and manipulating the models, they experience pulleys, levers, gears, and wheels and axles, while exploring energy, buoyancy, and balance. The set is designed for use by teams of two or three children. It includes full-color activity cards with pictorial instructions for eight models; a plastic punch-out sheet with eyes, sails, scales, and wings; and a plastic bin for easy cleanup and storage. Use with the *Early Simple Machines III Teacher's Guide*. Ages 5+.

Contents of this kit:
1 binder
Early simple machines Lego pack (purchased from Lego Education, $116.95)
Story Starters book (purchased from Lego Education, $29.95)
Teacher's guide (purchased from Lego Education, $9.95)

"Designed to supplement the *Early Simple Machines Set*, this 36-page teacher's guide has excellent suggestions for introducing science concepts, hands-on exploration, and thematic activities."

Activity pack (purchased from Lego Education, $30.95)



"Designed for the 779656 *Early Simple Machines Set III*, this activity pack includes eight engaging 45-minute lessons, each with extension activities of up to 20 minutes, and four additional open-ended problem-solving activities. The activities are designed to enable students to explore, investigate, and solve tasks related to mechanical principles, as well as learn about energy, balance, buoyancy, and much more. Ages 5+."

Included in the binder:
Simple Machines background (http://www.fi.edu/qa97/spotlight3/)
Simple Machines Post-Test (http://www.edheads.org/activities/simple-machines/pdf/simple-machines-post-test.pdf)
Reproducible Investigation Log (Appendix E)
2 Teacher's Guides (from Lego Education)
Activity Cards (included in the set purchased from Lego)

Electronic Projects Lab

Description from Discover This:

Children will learn how to identify and use electronic parts, and how to read the all-important schematics and wiring diagrams as they work through the 75-IN-ONE Electronic Project Lab. They'll learn all about electricity and electronics, from basic principles to even physics and magnetism!

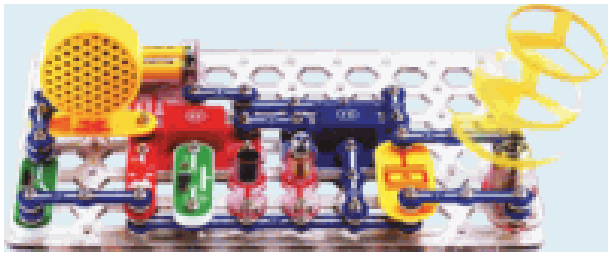
The battery-operated console creates a safe environment in which children can freely experiment. And another reason this is a good kit for beginners: there are no tools or soldering required, and the simple wire-and-spring method makes for frustration-free connections every time. The manual's illustrated projects are each written in easy-to-follow lab style.

Contents of this kit:
75-in-1 Electronics Project Lab (purchased from Discover This, $47.95)
Red, white, blue, and yellow wire
4 AA batteries
1 binder

Included in the binder:
Science of Electricity Basics (http://www.eia.gov/kids/energy.cfm?page=electricity_science-basics)
Glossary of Technical Terms (http://www.mos.org/sln/toe/glossary.html)
Open and Closed Circuits Activities
(http://www.eia.gov/kids/resources/teachers/pdfs/primary%20open%20closed%20circuits.pdf and http://www.energyquest.ca.gov/projects/open-short-circuit.html)
Reproducible Investigation Log (Appendix E)
Helpful Science Websites (Appendix A)
Owner's Manual (included with lab purchased from Discover This)

Snap Circuits

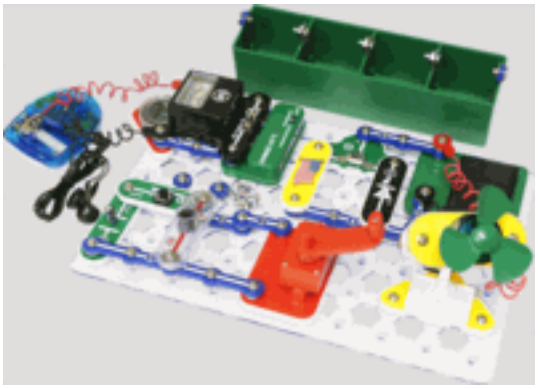
Descriptions from Discover This:



Snap Circuits Jr. 100 Electronics Set:

Using only their hands as 'tools,' children will follow the simple color-coded instructions to snap together more than 100 projects; there are no messy wires or soldering involved. On the underside of each piece, and spaced across the durable plastic base, are nubs that match up to the snaps on the bottom of each piece for a quick, secure fit. Ages 8 and up.

Green Alternative Energy Kit:



This kit features some of the latest innovations in alternative energy, put to use in working electronic projects children can make using safe, easy-building Snap Circuits. Children will create projects using a hand-crank dynamo, solar panel, and wind turbine. Parts work with other Snap Circuits sets. Ages 8 and up.

Contents of this kit:
Snap Circuits Jr. 100 Electronics Set (purchased from Discover This, $29.95)
Green Alternative Energy Kit (purchased from Discover This, $67.95)
1 binder

Included in the binder:
Science of Electricity Basics (http://www.eia.gov/kids/energy.cfm?page=electricity_science-basics)
Glossary of Technical Terms (http://www.eia.gov/kids/energy.cfm?page=kids_glossary)
Open and Closed Circuits Activities (http://www.eia.gov/kids/resources/teachers/pdfs/primary%20open%20closed%20circuits.pdf and http://www.energyquest.ca.gov/projects/open-short-circuit.html)
Reproducible Investigation Log (Appendix E)
Helpful Science Websites (Appendix A)
Instruction Manual for Snap Circuits Jr. (included with Snap Circuits Jr. kit purchase)
Instruction Manual for Snap Circuits Green (included with Green Alternative Energy kit purchase)
Think Green: Learn about Energy (included with Green Alternative Energy Kit)

Energy Lab

Description from Discover This:

This lab kit is designed to make children aware of the importance of energy conservation. The kit's comprehensive book deals with renewable sources of energy such as wind, solar, tidal, hydroelectric, geothermal, and biomass - all of which are friendly alternative sources of energy, replacing non-renewable energy such as coal, oil and natural gas.

Ages 8 and up.

Contents of this kit:
Energy Lab with 10 parts (purchased from Discover This, $53.95)
1 binder
Energy Book
Assembling and Operating Instructions

Included in the binder:
Comparing Light Bulbs (http://www.need.org/needpdf/PriComparingLightBulbs.pdf or http://www1.eere.energy.gov/education/pdfs/efficiency_comparinglightbulbs.pdf)
Meet the Sun (http://energyquest.ca.gov/projects/sunenergy.html)
Make a Turbine (http://www.need.org/needpdf/PVCTurbineDirections.pdf)
Energy in Food (http://www.eia.gov/kids/resources/teachers/pdfs/PRI%20ELEM%20_Energy%20in%20Food.pdf)
Energy Activity: Motion (http://www.eia.gov/kids/resources/teachers/pdfs/PrimaryActivityMotionpdf.pdf)
Energy Source Puzzles (http://www.eia.gov/kids/resources/teachers/pdfs/PuzzlesPriElem.pdf)
Wind Logic Puzzles (http://www.eia.gov/kids/resources/teachers/pdfs/Wind%20elem%20logic%20puzzles.pdf)
Energy Play: Harry Spotter and the Chamber of Windy Myths (http://www.eia.gov/kids/resources/teachers/pdfs/HarrySpotterPlay.pdf)
Sources for Worksheets (Appendix B)
Reproducible Investigation Log (Appendix E)
Helpful Science Websites (Appendix A)
Energy Book (included with Energy Lab purchased from Discover This)
Assembling and Operating Instructions (included with Energy Lab purchased from Discover This)

Van deGraaff Generator

Description from Ramsey Electronics:

VG200 – 200 kV Van deGraaff Generator

- 200,000 volt potential
- Sparks up to 5"
- Operates in high humidity
- Available kit or assembled & tested

Create your own lightning with these time-tested devices that have delighted students for decades! Named after the inventor Van deGraaff, a German physicist, this machine produces low-amperage static electricity that can be "shocking" but perfectly safe. Two different pulleys with 2 neoprene belts inside a 1.75" plastic column create and carry static charge up to the 7" polished aluminum collector globe. You can draw out this static charge in a burst of lightning, sparks, or you can even set each hair on your head on end! It's an incredible display! The entire unit is 18" tall and runs on 110VAC and includes a ground clip for discharge wands. Our comprehensive instruction book tells you how to raise hair, produce lightning and electric wind, experiment with St. Elmo's fire or electrostatic attraction and repulsion.

Description from Science First:

Mini Discharge Wand (for Van deGraaf)

Make electricity by friction; store and transfer it; learn about electrophorus and proof plane. Includes: electrophorus with charge plate and handle; 6 friction rods, labeled; acetate and polyethylene cloth; proof plane with transfer ball; neon lamp; conductive ball with hook; pith balls; instructions.

Contents of this kit:
VG200 – 200 kV Van deGraaff Generator (purchased from Ramsey Electronics, $139.95)
Discharge wand (purchased from Science First, $42.95)
8 – 4 ½ inch pie tins
1 binder

Included in the binder:
Safety Information (page 13)
Usage (page 14)
History of the Van deGraaff Generator (http://www.mos.org/sln/toe/history.html)
Van deGraaff Generator Background Information (page 15)
Van deGraaff Generator Experiments (pages 16-17)
Electrostatics Packet
(http://education.jlab.org/beamsactivity/6thgrade/electrostatics/electrostatics.pdf)
Static Electricity: Background Information for Teachers
(http://www.mos.org/sln/toe/staticintro.html
Static Power (http://www.need.org/needpdf/PriStaticPower.pdf)
Lightning Safety Quiz (http://www.mos.org/sln/toe/safety.html)
Reproducible Investigation Log (Appendix E)
Discharge Wand instructions (included with discharge wand purchased from Science First)
Van deGraaff Generator instructions (included with Van deGraaff purchased from Ramsey)

Safety:

This generator is safe when used properly. As with all electrical appliances, follow these general safety rules.

1. Plug the generator into a grounded 3-prong 110 volt 60 Hz outlet only.

2. Do not operate in a wet or damp location or outdoors (to avoid shock).

3. Check for loose, worn or frayed wires. Replace any defective parts.

4. Do not operate on a metal table with an insulator in between, it will diminish output and can act as a capacitor. For best results place on a wood or slate table.

5. Since discharge of electricity can damage electronic devices, keep away from appliances such as televisions, computers, stereos, microwave ovens. Nearby electrical equipment should also be turned off prior to using the Van De Graff.

6. The shock caused by touching the generator directly is not harmful and is similar to the shock received when walking across a carpet and touching a metallic object. It may feel uncomfortable however and should therefore be avoided.

7. People with cardiac pacemakers or a heart condition should never operate the generator or come in contact with it.

8. Adult supervision required.

PLEASE READ ALL DIRECTIONS CAREFULLY!

Using the Discharge Wand

Purpose:
The Discharge Wand provides a convenient way to discharge the collectors of Van de Graaff generators.

To Use:

- Connect the wire lead from the wand to the ground terminal on the Van de Graaff Generator. The terminal is a banana plug socket. The alligator clip is used to connect to other models.

- To discharge the Van de Graaff, bring the domed end of the wand close to the collector of the Van de Graaff.

- This will draw arcs to the dome of your wand. You will hear and see a spark which discharges the Van de graaff.

- To completely discharge the Van de Graaff, touch the dome of the wand to the dome of the Van de Graaff and keep it there. This will create a continuous grounding and allow a person to touch the Van de Graaff without being shocked.

Tips for using the Van de Graaff:

- Use a power strip with an on/off switch to plug the generator into. It is easier to flip the on/off switch each time then to have to unplug the generator between experiments.

- Always discharge the collector dome between experiments and when you are finished. Use the discharge wand for this.

- The motor produces a lot of heat that could damage the belt or the motor itself. Do not run the generator continuously for long periods of time. Turn it off when not in use.

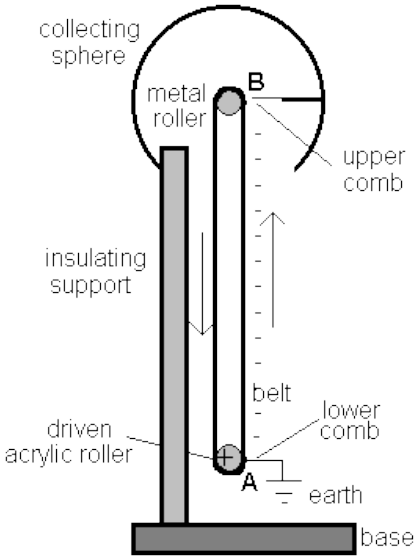
- Try all the experiments before doing them with a class

- Works best in low humidity

Van de Graaff Generator Background Information

This was first invented by Robert van de Graaff in 1931. The idea was to build a machine that could accelerate ionized atoms using an electrostatic field. It is important to realize that the models used for schools demonstrations are just that - models. They show the principles of operation, but are greatly simplified versions, achieving neither the scale or performance of research Van de Graaff accelerators, which achieve voltages of many millions of volts. One of the largest Van de Graaff generators ever built in air (many modern machines are contained in low pressure vessels to increase the breakdown potential) is now on display at Boston Science Museum, after being used in research at the MIT for many years. It can produce up to two million volts.

The model Van de Graaff generator is a common school demonstration due to its ability to demonstrate many of the principles of electrostatics, and achieve very high voltages, capable of causing electrical sparks to jump several centimeters in dry air. Its operation is explained with the help of the diagram below.



When the motor turns the bottom roller, the friction between the acrylic and the rubber causes the acrylic to become positively charged. This attracts electrons to the tips of the comb A where they collect, and then spray via the action of points onto the belt. The belt carries this negative charge up to the top comb where the same inductive effect occurs, this time the comb tips become positively charged causing positive charge to spray onto the belt and neutralize the charge on the belt. The deficiency of positive charge on the collecting sphere continues, leaving it more and more negatively charged, until the rate of charging equals the rate of discharging to ground from the dome.

University of Glasgow, Created and maintained by Ken Skeldon,
http://www.physics.gla.ac.uk/~kskeldon/PubSci/exhibits/E10/

Van de Graaff Generator Experiments

1. Hair raising

Steps

- Start with the generator off and fully discharged.
- Have a volunteer stand on a plastic footstool or something to insulate them from the floor. The volunteer places one hand on the top of the Van de Graaf.
- Turn on the generator. The hair should slowly start to float up and away from the head.
- Once you are ready, turn off the generator.
- After the generator is off, the volunteer can remove his/her hand from the generator.
- Discharge the generator using the discharge wand.

Notes/tips

- This is the most well known experiment using a Van de Graaff Generator.
- The volunteer should not touch anything while their hand is on the generator, or they will receive a mild shock.
- This works best with long fine hair, but almost any hair type will work. Dry hair without any styling product (i.e. hairspray, mouse, gel…) is recommended.
- The volunteer may receive a shock as they step off the footstool or remove the hand from the generator. To avoid this, the volunteer can try to "shake off" the excess charge.

2. Van de Graaff Volcano

Steps

- Tape a plastic container to the top of the generator.
- Place paper punch holes in the container.
- Turn on the generator.
- Discharge the generator using the discharge wand.

Notes/tips

- Once the generator has been turned on, the paper goes flying out of the container, looking like an erupting volcano.
- Masking tape or scotch tape both work for this experiment.
- You can also try this using a paper, metal or Styrofoam cup
- Instead of paper try Rice Krispies, packing peanuts, confetti, small Styrofoam balls, or pom-poms.
- You could also try placing the paper punch holes directly onto the generator.
- This can create a mess.

3. Strings

Steps

- Tape long strips of paper to the top of the generator.
- Turn on the generator.

Notes/tips

- Once the generator has been turned on, the paper stands up.
- Masking tape or scotch tape both work for this experiment.
- Newspaper also works.

4. Flying Saucers (Pie plates)

Steps

- Place a stack of aluminum pie tins on top of the generator.
- Turn on the generator.

Notes/Tips

- Once the generator is on, the tins will lift and float off one at a time.
- Try this with the tins facing both up and down and note the difference.

Explanation

- What's happening is that the top tin picks up a charge and is repulsed by the generator and the tins under it. As soon as it is gone, the next tin is also repulsed, and so on until the entire stack has taken off.

5. Balloons

Steps

- Inflate two balloons and tie the balloons together with a string.
- Turn on the generator.
- Hang the balloons over the end of a wooden stick and bring them close to the dome.
- Observe and explain.

Notes/Tips

- Try seeing what it does with only one balloon.
- The balloons do carry a charge and can give you a shock.

Appendix A

Helpful Science Websites:

Energy Kids from the U.S. Energy Information Administration
http://www.eia.doe.gov/kids/

NASA Education
http://www.nasa.gov/audience/foreducators/index.html

Energy Quest from the California Energy Commission
http://www.energyquest.ca.gov/index.html

NEED (National Energy Education Development) Project
http://www.need.org

EdHeads
http://www.edheads.org

The Hands-On Technology Program
http://www.galaxy.net/~k12/

Middle School Science
http://middleschoolscience.com/index.html

Appendix B

Sources for Worksheets

"Comparing Light Bulbs." *The Need Project.* www.NEED.org

"Meet the Sun." *Energy Quest*. California Energy Commission.
http://energyquest.ca.gov/projects/sunenergy.html

"Make a Turbine." *Energy Quest*. California Energy Commission.
http://energyquest.ca.gov/projects/turbine.html

"Energy in Food." Energy Kids, U.S. Energy Information Administration.
http://www.eia.doe.gov/kids/resources/teachers/pdfs/PRI%20ELEM%20_Energy%20in%20Food.pdf

"Energy Activity: Motion." *U.S. Energy Information Administration – EIA – Energy Kids*.
http://www.eia.doe.gov/kids/resources/teachers/pdfs/PrimaryActivityMotionpdf.pdf

"Energy Source Puzzles." *U.S. Energy Information Administration – EIA – Energy Kids*.
http://www.eia.doe.gov/kids/resources/teachers/pdfs/PuzzlesPriElem.pdf

"Wind Logic Puzzle." *U.S. Energy Information Administration – EIA – Energy Kids*.
http://www.eia.doe.gov/kids/resources/teachers/pdfs/Wind%20int%20sec%20logic%20puzzles.pdf

"Energy Play: Harry Spotter and the Chamber of Windy Myths." *U.S. Energy Information Administration – EIA – Energy Kids*.
http://www.eia.doe.gov/kids/resources/teachers/pdfs/HarrySpotterPlay.pdf

Appendix C

Vendors:

For the kits:
Discover This (www.discoverthis.com)
27885 Irma Lee Circle, Suite 105
Lake Forest, IL 60045
866-438-8697
Purchased: Energy Lab, 75-in-One Electronics Projects lab, and both Snap Circuits kits

Lego Education (www.legoeducation.us/store)
PO Box 1707
Pittsburg, KS 66762-1707
Phone: 800-362-4308 Fax: 888-534-6784
Purchased: Early simple Machines kit, Early Simple Structures kit, Straw Rocket Launcher, and supporting materials for these kits

Ramsey Electronics (www.ramseyelectronics.com)
590 Fishers Station Dr.
Victor, NY 14564
Phone: 800-446-2295 Fax: 585-924-4886
Purchased: Van deGraaf Generator

Science First (www.sciencefirst.com)
86475 Gene Lasserre Blvd
Yulee, FL 32097
Phone: 800-875-3214 or 904-225-5558 Fax: 904-225-2228
Purchased: Mini Discharge Wand (for Van deGraaf Generator)

For circulating material to support the kits:
Baker & Taylor
Midwest Tape

Appendix D

Catalog records from MPPL

Electronic Projects Lab
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c535830

Energy Lab
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c536832

Early Structures
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c536791

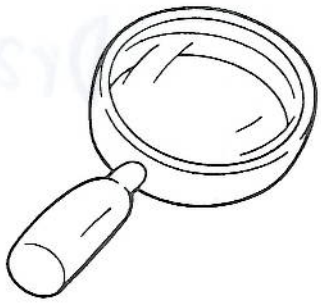
Snap Circuits
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c535839

Straw Rocket Launcher
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c535837

Early Simple Machines
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c536793

Van deGraaff Generator
http://catalog.mppl.org/?hreciid=%7clibrary%2fm%2fmppl-dynix%7c536772

Investigation Log



Question: What I want to know is:

Prediction: What I think I will find out is:

Procedure: How I will find out is by:

Materials: What I need for my investigation is:

Draw Your Investigation

Investigation Notes:

Mad Scientist Club General Information

Wednesday, September 8th
Topic: Electricity
Description: Mad about science? Join us for fun hands-on science explorations and even create an amazing project to take home. Experiments this time will be electrifying! Space in the lab is limited to 20 3rd to 5th grade scientists who live in Mount Prospect--so register today!
Activities: Vande Graaff Generator and make a flashlight

Wednesday, February 16th
Topic: rockets/ flight
Description: Mad about science? Join us for fun hands-on science explorations and even create an amazing project to take home. Your imagination will reach new heights with these high flying experiments! Space in the lab is limited to 20 3rd to 5th grade scientists who live in Mt. Prospect so register today.
Activities: Straw rocket launcher, Saturn V Rocket model, and making flying fish

Wednesday June 1st
Topic: structures
Description: Mad about science? Join us for a fun hands-on exploration of engineering & physics as we lay siege to the castle and build towering turrets. Even create an amazing project to take home! Space in the lab is limited to 20 3rd to 5th grade scientists who live in Mount Prospect--so register today!
Activities: Early structures lego kit, Tallest tower challenge, make catapults

Each program was 1 hour long, but will be longer in the future due to patron feedback. Registration for the programs filled up quickly and all three programs were full with a full waiting list as well. The programs all had good attendance ranging from 18-20 children. Future programs are being planned around other Science to Go kits and science themes.

Science Grant Purchases

7 Kits ($150 each for a total of $1050)

1. Straw Rocket Launcher

Rocket Launcher	$169.00
Teacher's Guide	$24.95
Straws (class pack)	$19.95
Total:	$213.90

2. Early Structures

Lego pack for Early Structures	~~$94.95~~ 96.95
Story Starters	$29.95
Total:	$124.90

3. Early Simple Machines

Lego Simple Machines Set III	~~$114.95~~ 116.95
Teacher's Guide	~~$12.95~~ 9.95
Activity pack	~~$29.95~~ 30.95
Story Starters	$29.95
Total:	$187.80

4. Electronic Project Lab

75-in-1 Electronic Project Lab	$47.95
Total:	$47.95

5. Snap Circuits/Snap Circuits Jr.

Jr. 100 Electronics Set	$29.95
Green Alternative Energy Kit	$67.95
Total:	$97.90

6. Energy Lab

Energy Lab	$53.95
Total:	$53.95

7. Van deGraaf Generator

Van deGraaf Generator	$139.95
Mini Discharge Wand	$42.95
Total:	$182.90

Other costs for kits:

Shipping from Discover This	$10.21
Shipping from Lego Education	$55.31
Shipping from Ramsey Electronics	$7.97
Shipping from Science First	$8.95
Total:	$82.44

Total costs spend for kits: $982.79

Binders for science kits $17.43

Circulating print collection total $600

Titles	
Mindstorms Mayan Adventure	$24.99
Doc Fizzix's Mousetrap Powered Cars & Boats	$9.95
Science and Math for Technology	$21.95
Building Toothpick Bridges	$29.00
Story Starters	$29.95
Energy for Every Kid	$12.95
Move it Work It: a song about simple machines	$19.49
Alternative Energy Beyond Fossil Fuels	$24.99
Master Engineer: Rockets	$10.71
Why Do the Lights Turn On?	$28.00
My First Book About Airplanes and Rockets	$4.51
Electricity and Magnetism Science Fair Projects	$27.68
Understanding Electricity	$21.68
All about rockets	$17.00
See inside How Things Work	$9.74
How Did That Get to My House? Electricity	$18.15
Rockets	$25.54
Electricity and Electrical Circuits	$26.25
Alternative Energy Sources	$26.25
Engineering ABC's	$7.11
Electrical Circuits	$12.71
How Things Work Encyclopedia	$9.60
Ocean, Tidal, and Wave Energy	$19.95
Earth's Energy	$18.24
Energy	$12.40
Sustainable Energy	$19.49
Rocket-Powered Science	$14.20
Lever, Screw, and Inclined Plane	$14.32
Cool Stuff 2.0 and how it works	$14.12
Build it Green	$24.59
	Total: $555.48

Circulating AV collection total $400

Titles	
Lego Education Pre-School Activity Software	$29.95
Lego Education Kindergarten Activity Software	$29.95
Dr. Zoon SunEzoon Video	$24.95
Dr. Zoon Straw Structures Video	$24.95
Dr. Zoon Toothpick Bridges Video	$24.95
Alternative Energy Sources (DVD)	$15.99
Dragonfly TV-Flight (DVD)	$23.99
Electrical Circuits (DVD)	$39.99
Electricity (DVD)	$39.99
Energy Alternatives (DVD)	$47.99
The Future Fuels Series 1 (DVD)	$11.99
Introduction to Electricity (DVD)	$23.99
Newton's Apple Multimedia: Rockets/Gravity (DVD)	$23.99
	Total: $362.67