Fun. Educational. Inspirational.

Science & Math Achiever Teams

Southwestern University

Volunteer Guide Adapted from Yale University:
http://www.yale.edu/prgsmart/resources.html

VOLUNTEER GUIDE

FALL 2007

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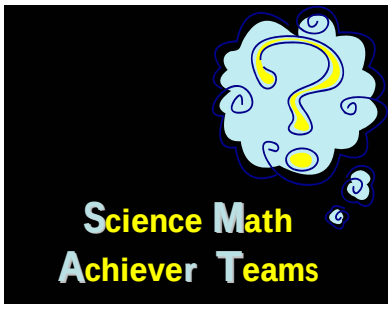

This **VOLUNTEER GUIDE** is intended to help you to be a better volunteer, mentor, and teacher to your student-partner.

SMArT, Science and Math Achiever Teams, is a mentoring program which provides Southwestern University students with the opportunity to share their interests in science or math with elementary school students. This uniquely successful program pairs college students one-on-one with third, fourth or fifth graders to complete a math- or science-related project of their choice over the course of 9-10 weeks.

Volunteers meet with their partners once a week for an hour to work on their project. At the end of the program, the students display their projects at an Achievement Party, an open house to which parents, faculty, administrators, community members, and the media are invited. This also provides time for the volunteers and students to learn about and discuss the projects that other pairs have completed.

Program SMArT's design allows students to explore an area of interest with personal attention and ample resources, which often are not available to them in the regular classroom setting. The elementary school students learn that through planning and commitment they can achieve their goals and have a finished product. They also see that learning does not require being lectured at or being forced to do something, but rather that learning can be fun and rewarding. Program SMArT creates an environment of cooperative learning. Interacting in such an environment is a unique experience for most students in SMArT.

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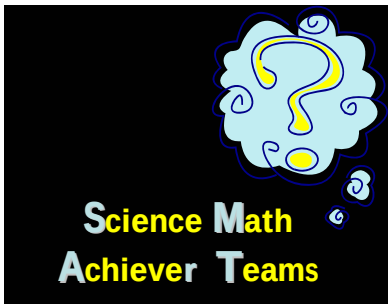

Project Summary:

This SMArT (Science Math and Achiever Teams) Program will involve 10 Southwestern students (from any discipline, although largely recruited from the sciences) and 10 community students for 9-weeks. Each pair (one college student & one community student) would meet once a week after school to work together on a project of scientific inquiry. Although some emphasis would be placed on ecological projects, teams will have the flexibility to investigate whatever inspires them about science. The inquiry is "question-based," but not necessarily hypothesis-driven. The outcome will be an Achievement Party where each of the teams share their work with the group and the community. SU students will also have the opportunity to discuss their experience working with community students.

Rationale:

STEM (Science, technology, engineering and mathematics) education represents a priority nationwide for many reasons, most of which underscore the U.S. struggle to keep pace with other nations in developing scientists, engineers, and professionals with technological expertise, and, most importantly, qualified teachers to educate them. A 2005 report commissioned by the Business-Higher Education Forum (BHEF), *A Commitment to America's Future: Responding to the Crisis in Mathematics and Science Education*, connects lackluster student performance in science and math with predictions of this country's rapid loss of competitive edge in the global marketplace. Key data cited in the report include:

- The 2004 Program for International Student Assessment, showing the problem-solving skills of American 10th graders was significantly lower than their peers in 25 countries.
- The U.S. Department of Labor predicts that from 1998-2008, jobs requiring science, engineering, and technical training will increase by 51%, and that by 2008, there will be some 6 million job openings for scientists, engineers, and technicians.
- Attempts to recruit and retain science and math teachers at the secondary level have been largely ineffective, and in 2008, the data suggests that the U.S. public education system will need between 260,000 to 290,000 new high school math and science teachers.[1]

Statewide, a recent report by the Fordham Institute blames the public school science curriculum for inadequately preparing students for work in math and science, and gives the Texas science standards unfortunately earned the third worst score in the country. The report also cited that approximately half of all students in Texas' state colleges and universities need remedial classes in science and math.[2] Even in Georgetown Independent School District, which outperforms the statewide percentages for meeting TAKS standards, 25% of all 10th graders failed the science TAKS test in 2006.

With its fusion of mentoring and question-based inquiry, SMArTeams has the potential to spark the interest and imagination of students in ways that have far-reaching impact. Through this program, both Southwestern and public school students stand to make gains in their understanding around certain concepts and build new relationships at the very least, and at best, may be challenged to think critically about how to apply their learning, and for whom.

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[1] "Systematic Failures in U.S. Math and Science Infrastructure Threaten Global Leadership, Jennifer Ehrlich, Business-Higher Education Forum, February 16, 2005.

[2] "Texas Lags in Math, Science," Jamie Story, Texas Public Policy Foundation, December 22, 2005.

THE BASICS

What is a Day Coordinator?

A Day Coordinator leads each SMArT team of volunteers to the elementary school. Having worked previously with a student, your Day Coordinator is the "SMArT Expert" of the day, and is there to help you develop a creative and innovative project. The Day Coordinator is also responsible for ordering any supplies you may need and maintaining a cooperative working environment for the kids. For the first pilot program, Dr. Burks will serve as the Day Coordinator. However, for future programs, we hope to recruit a student for this responsibility. If you are interested now, please let Dr. Burks or Suzy know ASAP. Please **utilize** your Day Coordinator by asking questions about project ideas.

Going to the school

3:45 p.m. on Mondays @ the front of Fondren Jones Science Center

Each SMArT day travels **to and from** the elementary school as a group – no exceptions. **Please be on time** when meeting your SMArT day as it is important to be at the school at the allotted time. If you are unable to be on time, please contact your Day Coordinator so that he/she knows whether to wait a couple of minutes.

The first and second weeks

The first and second weeks of SMArT are atypical. The first week is intended for getting to know the students and to get them to start thinking about science. Therefore, the Day Coordinator leads the group in solving some scientific inquiry through a small demonstration. It is during the discussion of the demonstration when students usually pair with their volunteers; project ideas may emerge at this time as well.

Make sure to get the telephone number of your partner before leaving the first week. The second week is when the students and volunteer become specific about project ideas, decide on a creative and innovative project, and then order the supplies (via your Day Coordinator). The third and following weeks involve more typical project research and work.

Developing a SMArT project

One of the greatest concerns of new volunteers is creating a project. **DO NOT WORRY** – it is much simpler than it may seem. There is no need to approach the student the first week with a specific idea. Project ideas emerge through discussion with the student during the first and second weeks. It's important to center the project around the student's interests in order to maintain his/her attention and enthusiasm throughout the semester. Therefore, creating the project is a matter of developing the core idea using your Day Coordinator, other project aides (Project Journal etc.), and SMArT resources. It is crucial to plan the project through the program when developing the idea in order to have a creative and innovative project by the end when students and volunteers display their projects at the Achievement Party, an open house to which parents, administrators, and the community are invited.

Southwestern SMArTeams is designed as a project of inquiry so one should focus on **A QUESTION** and develop a method as a guide to the project process, and record your progress in the Project Journal.

The *essential* phone call

SMArT students love to come to SMArT and they will attend as part of the Williams Elementary Extended School Enrichment Program. However, kids will be kids, and they might forget to think about their projects. Therefore, it is **NECESSARY** to telephone your student the day before SMArT (SUNDAY) each week to remind him/her about SMArT and give an idea as to the objective of your next meeting. During your first phone call (the second week), please introduce yourself to the parents. Use the phone call as a time to develop your friendship and discuss your project.

Considerations working with this age group

- Positive reinforcement/vocabulary only; be open and encouraging.
- Avoid language barriers; let little kids define things as they understand them.
- Award initiative and thought with kind words.
- Be present, physically and mentally.
- Acknowledge that a range of ability to think abstractly exists.
- 8 (early 3rd grader) – 11 (late 5th grader) is a big mental and physical range of kids.
- Avoid generalizing – every kid/person is different.
- If you are struggling to explain a concept or idea to your partner, try using different methods to express your thoughts (draw a picture, use different descriptive terms, etc.)

Fall 2007 SMArTeams Calendar

Weekday	Date	Time	Event
Thurs/Fri	1.24-25.08	4 – 5 p.m.	Applications Distributed to Elementary Students (Amanda)
Tuesday	1.25.08	Lunch	SMArTeam recruitment meeting FYS Room (??)
Thursday	1.31.08	5 p.m.	Applications Due for Both Groups
Wednesday	**9.12.07**	**4 – 5 p.m.**	**Notify Elementary Students (?)**
Sunday	2.3.08	7 – 7:45 p.m.	SMArT Pep Talk with SU Students
Monday	2.11.08	3:30 – 5 p.m.	SMArT Day 1: Pairs and Brainstorming
Monday	2.18.08	3:30 – 5 p.m.	SMArT Day 2: Questions and Materials
Monday	2.25.08	3:30 – 5 p.m.	SMArT Day 3: Timelines and Objectives; Maybe Start Project
Monday	3.3.08	3:30 – 5 p.m.	SMArT Day 4: Materials Arrive; Start Project
Monday	3.7.08	3:30 – 5 p.m.	SMArT Day 4: Materials Arrive; Start Project
Monday	3.10.08	3:30 – 5 p.m.	SMArT Day 5: Continue Project
-------Spring Break-------			
Monday	3.24.08	3:30 – 5 p.m.	SMArT Day 4: Materials Arrive; Start Project
Monday	3.31.08	3:30-5:00pm	SMArT Day 6: Continue Project
Monday	4.7.08	3:30 – 5 p.m.	SMArT Day 7: Bring Project to Close; Sketch out Poster
Monday	4.14.08	**4:00-7:00pm**	**SMArT Day 8: Finish Poster; Achievement Party**
Monday	**4.21.08**	**Lunch**	**SMArT Volunteer Reflection Meeting FJS 148 ??**

The Job: Volunteer!
What does it take to be a SMArT volunteer?

One common misconception about volunteering in SMArT is that you need to be a science or math major. However, a high school science and math background is adequate to work with elementary school students. The most important qualities needed to volunteer are enthusiasm and the desire to pique a student's interest in math and science through a "hands-on" project.

Each week, the volunteer meets with the student for about an hour. In addition, the volunteer may want to spend a small amount of time preparing material related to the project. This is a very manageable time commitment. However, this commitment is **serious**. It is very disappointing for an elementary school student to remain after school only to find that his/her partner does not arrive with all of the other volunteers and will not attend that afternoon's session. If a conflict should arise, making it impossible for a volunteer to work with his/her partner on the regularly scheduled day, it is often possible for an alternate to take his/her place.

To ensure that both the volunteer and student are present for each after school session, communication between students, volunteers, and day coordinators is crucial. Volunteers are encouraged to call their partners every week, preferably the day before their set meeting, to remind the student to stay after school for SMArT. These weekly calls are designed to prevent the volunteers from being frustrated when they take the time to go to the school only to find that their partners are not there. SMArT experience has shown that a brief telephone call the evening before greatly increases the chance that the student will remember to be at SMArT. A five minute call lets the student know that the volunteer is enthusiastic about the project, and this often helps keep the student interested in the project. Communication with the coordinator by the volunteer will ensure that the pair will be able to continue their project without missing an afternoon session.

Some volunteers have even met with their student outside of SMArT to visit a lab at the college or university. This may be a possibility for the program. A true partnership is the result of a successful SMArT experience; this relationship grows over the course of the program, providing the elementary school student with a role model and the volunteer with a special friend.

The First Week: Day One

Program SMArT begins with an orientation meeting for all of the volunteers in a team the week before the program. At this time, volunteers meet the team/day coordinator and discuss what to expect for the program. The coordinator also will set a place to meet the volunteers each day before walking/driving to the elementary school. Throughout the semester, the volunteers will meet at this location and then arrive at the school together. Everyone also returns to campus together. This not only provides safety, but also creates an opportunity for volunteers to get to know each other.

The first day of SMArT usually begins with everyone sitting in a circle. For the pairing process, it helps if volunteers and students alternate themselves in the circle so that each volunteer is sitting between two middle school students. To start, everyone plays a name game. Then, the coordinator will tell the students a little about SMArT and how the program works. Next, everyone participates in a "hands-on" science demonstration, and then they break into smaller groups to discuss which principles were demonstrated in the activity. This provides a way for volunteers and students to start talking and also helps in the pairing process.

At this point, each volunteer should begin talking about science and/or math with a student and asking questions to find out what the student's interests are. Often, students do not have a firm idea of an area of science that they want to concentrate on and they usually do not know what kind of project they want to do. So, creativity is required. If a volunteer does not have any ideas for a project, they can always ask the coordinator for help.

<u>The following questions may be helpful in starting a dialogue:</u>

1) If you could invent anything in the world, what would it be?
2) Which animal do you like best? Why?
3) Do you know how your household appliances work?
4) What is your favorite sport? Do you know how the equipment works?
5) Do you do any cooking and cleaning around the house? Do you know how the stove works, why cakes rise, how cleaning solutions work?
6) Do you like to look at the stars? Do you know their names?
7) Which class is your favorite? What have you done in this class?
8) Do you have any hobbies?

By asking such questions, the volunteers attempts to pinpoint where the students' interests lie and what kind of projects would suit them best. The volunteers should also aim to figure out how much experience the students have had in order to help select a project which is neither too advanced nor too basic. The following questions serve this purpose:

1) What are you doing in your science class right now?
2) What kinds of experiments have you done before and liked?
3) Do you ever do any projects outside of school? (e.g. building models, bird watching, etc.)
4) What are you doing in math class right now? Do you know your arithmetic? Can you do long division? Do you know how to do any algebra?

NOTE: These are just a few examples of possible questions that volunteers may wish to ask. This is not an interview, however, and volunteers should use personal judgment to tailor them to stimulate a conversation. These questions are designed to help the volunteer and student begin to learn a little about each other as they try to devise potential project ideas.

At the end of the first day, everyone will discuss the science demonstration together in order to discover what each group's ideas were and to see what actually did occur. Then, everyone will help clean up. Students will be reminded when SMArT will meet next. It is a good idea to exchange phone numbers at this time.

The Second Week: Day Two Creating your Project

In order to create a project, each volunteer should discuss the student's interests while thinking of ways in which a project can be related to these interests. The following is an example of a conversation similar to one that led to a past successful SMArT project:

Volunteer: What is your favorite subject in school?
Student: Art.
Volunteer: What do you like to do in art?
Student: I like to paint.
Volunteer: Do you like colors?
Student: Yes.
Volunteer: Do you know why we see colors?

From this point, the volunteer and student created a project studying the structure of the eye and how it sees color. The student also dissected a sheep's eye and was able to study its parts, including the lens. This pair also discussed visual light and prisms. (Refer to the curriculum on light, vision, and color that are readily available for additional project ideas in this area.)

As another example, if a student is interested in music, a project could involve studying sound waves and creating simple drums and stringed instruments. The student could experiment to see how differences in the tautness of the drums and lengths of the strings alter the sounds produced by these instruments.

A large part of the value of Program SMArT is that the student gets to design his/her own project. So, it is important for the volunteers to try to encourage the students' creativity and originality. For additional project ideas, volunteers may go to the Georgetown Public Library or the children's section of the Smith Library. In the children's section, there are many books with fun projects in all areas of science and math. Volunteers may also search the web for ideas using a guide prepared by SMArT.

Inquiry: Learning to Investigate a Question

http://scene.asu.edu/habitat/inquiry.html

Figure 1: Raising questions

K - What do I already know?

Before students generate questions to investigate, it is a good idea to have them review what they know, or think they know, about the topic under study. This focuses student interest and attention, reveals misconceptions, and allows a mentor to assess where the inquiry should or might lead.

This is the first part of the KWL process:

K = What do I know? W = What do I want to know? L = What did I learn?

W - What do I want to know? - Exploring

Questions naturally arise from experience with the world around us. School experiences often discourage children from questioning, especially when the classroom climate emphasizes getting the right answer. Most teaching formats involve teachers posing the question and students trying to answer it. The teacher who wants to encourage student inquiry may find it difficult to get students to raise any questions at all, much less any interesting or productive questions that could actually be investigated.

A good tool to address this problem is the "I notice/I wonder" chart. For older students, the columns are labeled "Observations" and "Questions." In the left hand column, students write down things they notice that are interesting to them; in the right hand column they note the corresponding question(s) that the observation provokes.

I notice	I wonder
Spiders	What do they eat?
Seeds	What kind are they?

Figure 2. I notice/ I wonder.

In order to generate questions, students need to have hands-on or observational experience with the materials or phenomenon first. The younger the child, the longer the time needed for the hands-on exploration and the simpler the question can be. The mentor will ultimately set the limitations for what is "doable" based on the list of successful and unsuccessful projects and the guide of the Day Coordinator. For example, if the topic is light, one might provide flashlights and mirrors and a darkened room for free experimenting before the children start generating questions.

Kinds of questions

Sometimes the stumbling block to inquiry is not getting students to raise questions, but the kinds of questions they raise. Questions nearly always fall into one of three categories:

1. Questions that can be investigated;
2. Questions that can be answered by doing research (looking up the answers);
3. Questions to which the answer is highly complex or not known.

Other kinds of student questions are: comments expressed as questions (which can be responded to in a way that encourages students' curiosity and reinforces making observations), requests for simple facts (which can be given if the mentor knows the answer or can be looked up later), and philosophical questions, which are often "why" questions to which there is no answer.

However, many questions that students phrase with a "why" can be restated so that they can be investigated. If you can turn the question into a "how would you?" or a "what would happen if?" question, it can usually be investigated. To turn questions, you need to break the big, complex "why" question into smaller, component parts (i.e. variables).

For example, let us imagine that a student asks, "Why do plants grow?" Variables immediately apparent are factors such as light, water, soil, and nutrients. We might then rephrase the question into several "what would happen if?" questions that can be investigated by students: "What would happen if we stop giving plants water?" "What would happen if we give plants more light?" "What would happen if we add nutrients to the soil around a plant?" "What would happen if we remove the plant from soil and place it in water?" As basic principles are discovered, the investigation can be refined and made more challenging as students try to find the optimal growth conditions for the plants with which they are working.

More on questions

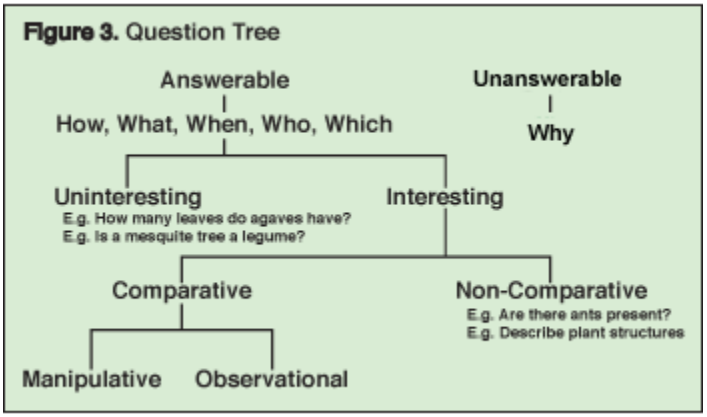
You may have noticed that the question about why plants grow could be answered either by student investigation or by looking up the answer. Many questions that students ask will fall into both categories. Obviously, there is not enough time to conduct an investigation into every interesting question that students raise. It is up to the mentor to choose which questions should be answered with a full investigation, and to help students choose appropriate resources to find answers to questions that will not be investigated. By doing just one simple investigation, you will enrich your students' education tremendously.

When considering which questions to investigate, you need criteria for what makes a question investigate-able in your classroom. Some criteria to consider are:

- Can the question be answered by making observations, collecting data, making measurements, changing variables?
- Can we narrow the question to look at a single thing?

- Can we conduct the investigation safely?
- Do we have or can we acquire the necessary materials?
- Does the investigation fit the developmental level of the children?

The Question Tree below is a helpful tool as you consider what kinds of questions you will investigate with your students.



L - Reflecting on what has been learned

The last part of the KWL sequence is, "What did I learn?" Reflecting on what was learned in the course of an investigation/experiment is an integral part of the inquiry process. It is the part that leads to the generation of more questions for investigation. It can also be a self-evaluation tool for students. Reflection should focus not only on what was discovered, but also on the process of the investigation itself: What did we do that worked? What didn't work and why? What could we change next time to get more accurate results? And so forth.

Inquiry is not a linear process, it is a circular one. We do not start at Point A and arrive at Point B and stop. Because what we have learned on the journey from Point A to Point B has made us curious about a new question, C. So off we go again on another adventure. No scientist ever finishes his work, just as no human being ever stops learning.

THE KEY TO THE SMArTEAMS PROGRAM IS TO FINISH THE PROJECT BY ASKING "WHAT'S YOUR NEXT QUESTION?"

KEEP TRACK OF QUESTIONS THROUGHOUT SMArT IN YOUR LOG

Inquiry can [but doesn't necessarily have to] lead to the SCIENTIFIC METHOD:

1. Observation
2. Hypothesis
3. Procedure (Materials & Methods)
4. Experiment
5. Results
6. Discussion / Conclusions

If the volunteers and students decide upon projects requiring materials that need to be ordered, they may use any remaining time to begin perusing the equipment catalogues provided. Volunteers should try to keep the project expenses as low as possible (limit $50) by comparing prices in catalogues. All orders should be given to the Day Coordinator.

Note: often the best projects are "home made ones" that involve household supplies – the day coordinator can be given a list of such supplies to pick up or mentors can volunteer to get the supplies themselves. If this is the case, be sure and KEEP RECEIPTS.

The Rest of the Semester:

This will be the rough guideline for the rest of your semester. Your Day Coordinator will make sure you and your partner stay on track.

WEEK 3	Examine research gathered (OBSERVATION) Refine QUESTION Plan out Weeks Ahead
WEEKS 4-7/8	Doing the project (INQUIRY) Gathering RESULTS Forming CONCLUSIONS
WEEK 8/9	Presentation Preparation Poster Planning
WEEK 9	Achievement Party

Safety in SMArT:

Being safe mainly involves common sense. The coordinator will discuss general safety rules with the elementary school students the first day of meeting. However, it is also important that each volunteer practices and helps to enforce these rules in order to ensure that no one gets hurt during the program.

General Rules:

1) Think safety and act responsibly.
2) Always alert the coordinator if there has been an accident or injury.
3) Read directions before starting experiments.
4) Never perform unauthorized experiments. (For example, do not perform experiments with chemicals unless you are guided to do so by a chemistry manual.)
5) Think of your neighbors…be courteous.
6) Be sure you know where the fire extinguisher is kept and how and when one should be used.
7) Be alert if you or someone else is working with chemicals or a flame. Often, people move around the room, and they may not be aware that you are working with these materials.

General Safety Procedures:

1) Wear safety glasses or prescription glasses at all times when handling chemicals.
2) Always wear rubber gloves when handling chemicals or dissecting.
3) Use proper equipment for handling chemicals and setting up experiments.
4) Wear gloves to pick up hot materials.
5) Tie back long hair and restrain floppy clothing while working with chemicals or flames.
6) Clean up and dispose of materials properly.
7) Be weary when you or the student handles sharp objects.

First Aid Techniques:

1) In the event of an accident, remain calm and notify the coordinator and volunteer immediately.
2) If someone receives a burn, flood the burned area with cold water.
3) For acid or alkali burns, neutralize the affected area by washing with lots of water.
4) If acid or base splashes in the eyes, flush the area with flowing water from a sink for a minimum of five minutes. By this time the coordinator should have been notified.
5) For cuts:
    - **a.** Be careful! To avoid the possible transmission of HIV, do not touch the wound. There are rubber gloves in the closet which will provide some protection if it is necessary to aid a person who has been cut.
    - b. Flush the area with water to remove foreign matter.
    - c. Try to reduce the bleeding by placing pressure on the cut area.
    - d. Notify the coordinator.
    - e. The coordinator will clean up any spilled blood with bleach.

NOTE THE LOCATION OF THE FIRST AID KIT. BE SURE YOU KNOW WHERE THIS KIT IS LOCATED SO THAT YOU CAN GET IT IN THE EVENT OF AN EMERGENCY.

HAVE FUN, and ENJOY THE SEMESTER!

Past Successful Projects
Project Lists | **Other Project Ideas** | **Unsuccessful Projects**
[return to resources]

Project Name/Description	Comments	Recommended ?
Dissecting a Frog	Kids found it very interesting; need to take in supplementary material (research) to make it last longer	yes
Solar Car Build a Car from a Kit		yes
Rocket Car Propelled by Acid-Base reaction		yes
Dissections of a dogfish, shark, frog, various sea animals	very educational, good for explaining	yes
Balloon-Powered Vehicles Balloons, Kleenex, Tons of Fon!	Awesome	yes
Fetal Pig Dissection	only lasted two days, need extension of some sort	yes
Airplane Design We investigated parachutes (surface area = slower), Bernoulli's principle and the concept of life	This is a bit of a grab bag of an experiment. Make sure there is a theme.	yes
Rocket Car Baking soda and vinegar chemical rxn => rocket car goes	This is a good project if the volunteer knows what to do	yes
Planets and Solar Systems A model of the planels and some of the moons	Definitely good b/c you can work on it a little a day until the end at your own pace	yes
Pop or Not? Heat transfer with water and balloons	be careful with matches	yes
Volcano	if you want an easy one (N.B. hard to make scientific -- must find variable)	yes
Slimey Chemistry	If you keep it organized	yes
Plant Growth testing the relative success of plant growth rates in different liquids: orange juice, coke, oil	it's a fairly standard science project, but it definitely works. One thing--there isn't so much to do but watch the plants grow. Also, one problem is making sure no one messes w/the plants during the week. See if you can arrange w/teachers to keep them in a safe location.	yes

Crystal Growth growing crystals	not the most scientific, but interesting nonetheless. The kid really enjoyed it	yes
Crystal Growing (space age crystal kit) growing crystals	Successful because they grew some neat crystals, but it involved finding a hot pot and carefully following instructions, which brought some trouble.	yes
Fetal Pig Dissection Dissecting a fetal pig with handbook guide.	Successful because the student learned a lot about anatomy and dissection.	yes
Frog, Fetal Pig, Shark Dissections	It was a pretty straight forward project. Dissections are always interesting, and it's not a very difficult thing to do. You get to see a lot of the animals anatomy. However, be warned that any dissection is smelly.	yes
Rocket Power baking soda-powered rocket kit	Awesome project, we got the kit really late, if we had it earlier we could have performed more experiments with it	yes
Bottle rocket using two liter bottle, water, and bicycle pump to make rocket	Excellent project that attracts a lot of attention from other kids in the playground area. At Troup, we already have the equipment… all you need is 2-liter soda bottles	yes
Water Bottle Rocket Soda bottles of different volumes and contents were launched at various pressure using air pump. Distance traveled was recorded and compared.	A very exciting project if the weather is nice, since this activity must be done outside. The project may be dangerous, so only serious volunteers and kids should attempt to do this project.	yes
Kitchen Table Chemistry Assorted experiments in a premade kit	Experiments aren't hard, hard to incorporate scientific method though	yes
Magnetism Kit from Nasco w/various experiments	Premade kit makes experiments easy, may be hard to explain theory to kids	yes
Hyper Peppy Robot	Worked, well, the kid really liked it. Found it does not respond to noise and touch as advertised, rather responds to noise of touch.	yes
Hyper Peppy Robot	it works well and the kids love it, especially since they can take it home	yes
Egg Drop	Works really well when volunteer and student are creative. This was done as a rush project when previously ordered things did not work. You can have a lot of fun with this one.	yes
Egg Drop Dropping eggs in different apparati from various heights.	Successful because it was an excellent way to learn the scientific method through looking at methods of trial and error. Also, inexpensive and fun	yes
Physics Forces	Worked well with this particular student. Ordered bunch of materials to create various vehicles. Might not work for	50/50

	hyper, and not so curious students. Need good volunteer.	
Potato Clock	Was a neat way to see that electricity could be conducted using alternate power sources- downside, everything worked, but kids understood why some stuff should, and others should not.	50/50
Ant Farm observing ants in an ant farm	This project was really interesting because it was an excellent way of learning about community building and live animals are always popular with the kids. It was really sad when our ants started dying though.	yes
Lemon Battery Using lemon and potato to make a battery.	Failed because the volunteer and student did not spend enough time with the project. Also, the volunteer needed more information about how to make the project work as he didn't order this project from a kit with instructions.	yes
Show me the light Compared and learned about electrical circuits: parallel, series/ open, closed	Great project, especially for a day coordinator. It's easy, interesting, and fun. The instructions are very useful too because they outline the procedure and give great background information.	yes
Amazing Bridges (kit)	Tough but a good kit.	yes
Building bridges building bridges from popsicle sticks	Interesting and hands-on	yes
Venus Fly Traps	Worked if the plants are kept well.	yes
Perfume Testing different brands of perfume and their effect on people's moods and feelings	very easy, but not much science. Good for learnng the scientific method	yes
Making Paper Kit that takes things like cookie paper box and makes them into paper	Fun and easy.	yes
Testing Tap Water Kit for water quality	Easy to do and scientific. Plus it tells you how clean the school drinking fountain is.	yes
Testing Tap Water Kit for water quality	"great project. very easy and applicable and scientific."	yes
Measuring the Density of Rocks Kit that instructs how to find weight and volume of rocks to derive density	Not very exciting but it depends on the kid. We have an electronic balance for those at Troup who may be interested in adding a twist to this kit. We already have the rocks too!!	yes
Paper Airplane design and testing (from book) Making paper airplanes from book instructions	This project was based on just one book. It's great because all you need is the book (which is still in the closet) and some plain 8.5x11 paper. Lots of designs to make, good as a comparative kind of project.	yes

Solar Powered Cars and Light Energy We tried using different color light sources and different intensities to find top speed etc.	With the right activities, this can be a good project.	yes
Air Pressure, Force, and Momentum: physics investigations (KIT) Little physics experiments from kit	This is a pretty fun physics project that is certainly instructive. However, it features a number of different activities that don't quite hold together as a project. Still worthwhile I would say (the kit will last forever too as long as we don't lose any parts).	yes
Structures and Materials: which materials are best for buildling? Little physics experiments from kit	This is a pretty fun physics project that is certainly instructive. However, it features a number of different activities that don't quite hold together as a project. Still worthwhile I would say (the kit will last forever too as long as we don't lose any parts).	yes
Taste Test Where you taste things on your tongue	Very good and you can buy everything @ shaws. Kids love doing it.	yes
Lipstick Test Which lipstick is better?	Good & very simple. Easy to enforce scientific method	yes
Designing a webpage	Good if volunteer knows how to do it. Need to figure out how to get web access	yes
Electro Lab kit	Doable little projects	yes
Telegraph kit	Works fine	yes
Blood Testing The group used a blood testing kit to test different synethetic blood samples for A or B proteins and also for Rh factor.	It was one of the cooler and more "scientific" projects on my day. They also had an interesting Aids test. I would definitely recommend the project for an older student who has a decent science background.	yes
Melting Candy The group melted different types of candy including gummy bears and chocolate, and timed how long it took for them to melt. They tasted the candy after it had melted and tried to draw some general conclusions as to what caused some candy to take longer to melt and what caused the foul tastes for some after melting.		yes
Making tornadoes Kit + two 2-liter bottles connected to make tornado effect	lots of fun. very easy. and homemade	yes

Past Unsuccessful Projects
Project Lists | **Successful Projects** | **Other Project Ideas**
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Project Name/Description	Success Rate	Comments	Recommended?
Building a Telephone Built telephone using soldering iron		Too difficult and took too much time	no
Fossil Evolution Hit a rock with a hammer?		It's not really a project...	no
Solar Car		It was ok, but not that exciting	no
Bottle Tornadoes Bottles w/ connector & liquid		Cool to look at but not very educational	no
Dissecting a shark		only lasted two days, messy	no
Crystal Radio building a crystal radio from a kit -- just following directions		took a good amount of time; it worked but not really scientific method	no
Crystals Grow crystals with powder (kit)		Only do it as a last resort -- It's fast and easy but not that scientific	no
The Strength of Naked Egg testing the effects of vinegar, coke and orange juice on egg shells		this experiment simply didn't take long enough. It was interesting, but it's more of a one day time filling project	no
Magnets testing the relative strength of different magnets		not really an experiment. It was difficult to keep this kid interested in anything for very long	no
Slime Chemistry at Work Work with the standard kit	40	Project not unique, and not complicated enough	no
Radio Signals kit radio, kit motor	30	radio difficult, motor difficult, neither were completed	no
Radio Building Soldering resistors (many!) onto a circuit board	15	Failed because soldering was difficult and there wasn't enough time to complete. Margin of error was also slim, which made working with student difficult if project was to work.	no
Solar Energy Kit Various projects involving work with solar energy	20	Failed because did not include many necessary items and the volunteer and student had difficulty finding enough sunlight to try anything out.	no

Solar Car Solar car kit	15	Did not work because the sun is not strong enough to get the car running. Only works if you use a high powered light bulb.	no
Infrared Robot A robot was built and the time constraints did not permit the conduction of any experimentation. Soldering and troubleshooting wasted a lot of time.	50	Failed because soldering was a difficult task and student didn't have patience. Only benefit for the student was he learned to solder	no
Battery-powered airplanes (kit) From Nasco... comes with battery charger pack		Planes from the kit are made of styrophone and breaks very easily on landing. Motor doesn't even work.	no
Building motor/mouse cars (kit) Built a mousetrap and motor car.		The mousetrap car was impossible to build (never do in smart!!!). The motor one wasn't that bad to build, but the entire project was kind of unsuccessful due to the difficulty of the mousetrap car. You couldn;t really race the cars properly or make adjustments to them according to the hypotheses.	no
Science of Scent The group used a kit with different floral extracts to mix/make different fragrances. They then asked people what they thought about these fragrances and how they made them feel when they smelt them.		A hard project to make "scientific".	no
Bridges--triangle or square design Building bridges with popsicle sticks & comparing strengths of triangle or square design		this ended up being ok, although the stated problem of the relative strength of triangles vs. squares was a bit complicated. we also had some trouble with homemadeness of the project - difficulties getting the popsicle sticks to be the right size and getting them properly glued together	Maybe
Rockit Robot Kit		the kids really enjoyed this, although it was very much following directions from the box and not at all scientific.	no