

2007
Science Buddies Annual Report

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Executive Summary

Organization

The Kenneth Lafferty Hess Family Charitable Foundation is a 501(c)(3) public charity (founded in 1995). In 2001, the Foundation began its sole operating program: Science Buddies. Science Buddies is located in the San Francisco Bay Area, but serves students from all over the United States and English speakers in many other nations.

Purpose

Science Buddies focuses on helping a diverse audience of K-12 students do better science research projects. We provide some of the most useful and innovative educational material available on the Internet for students who are doing science fair projects. All of our programs aim to save students time, while simultaneously improving the quality of their scientific investigations. Our mission is to help children from all walks of life develop a love of science and an understanding of the scientific method.

Description of Programs

The common theme running through all Science Buddies programs is the goal of identifying specific student needs (e.g. "I need help selecting a topic for my project") and creating solutions (not just reading material) that actively engage students and scientific professionals. Our programs focus on:

- Involving science and technology professionals who can interact directly and indirectly with the students, making science real.
- Leading students to projects that are more challenging and that have higher science content than projects they might choose on their own.
- Saving students time and frustration: students WANT to use our tools because they save them time and make science research more fun.

We offer three main types of resources for students and teachers: how-to information that explains the scientific method and the process of creating a science research project; field-specific information that introduces students to various fields of science and provides ideas for research projects; and Web-based mentoring programs. Details follow:

1) The **Science Fair Project Guide** is a comprehensive online guide to doing science research and science fair projects. It includes step-by-step guidance, actual sample assignments, photos of science fair projects, tips for success, and self-grading guides for students. The Teacher Resources section includes a planning guide and printable copies of the how-to information.

2) The **Topic Selection Wizard** (TSW) is an immensely popular interactive tool that helps students to explore different topic areas for their science fair project. The TSW has two main components: the Interest Survey and the Interest Areas. First, the tool leads students through a series of plain English questions to help them determine science fields of true interest to them. Then the tool analyzes student responses to provide a custom-tailored selection of **Interest Areas** to visit. Currently, we maintain 26 different Interest Areas. Each Interest Area covers a major field of science or engineering and offers both background information (e.g. vocabulary, important concepts, equations, and safety information) and a large selection of Project Ideas, which are developed either in-house by Science Buddies' staff scientists or by science professionals who collaborate with Science Buddies. Each Project Idea includes a description of the subject matter, bibliographic references, locations of Internet-based public domain tools and/or real-time scientific data, and suggestions for experiments. During the 2007 season, we added approximately 300 new Project Ideas to the Science Buddies

website, bringing the total to 701. As we move into 2008, we will continue to update and expand the library of Project Ideas to meet the growing student and teacher demand.

3) **Ask an Expert** (AAE) is an online forum staffed by volunteer scientists and talented science students who help students anywhere, on a drop-in basis, with their project questions. AAE is a great way for students to get help when they don't have a parent, teacher, or other adult with the knowledge, time, or desire to help them. When students have such help, they have more fun doing their science fair project, undertake more challenging experiments, learn more, and generally develop a more positive interest in science. AAE also offers a searchable database of past questions and answers so that other students may benefit from past discussions. Science Buddies also conducts the **Classroom Scientists Program**, in which we match 2-3 volunteer mentors with a specific classroom of students and they work together over the science fair season in a private mentoring forum.

Highlights of 2007

2007 was a year of upgrades and development for Science Buddies. Our Ask an Expert forum grew in popularity and we conducted the first season of our Classroom Scientists Program. In the fall of 2007, we announced an updated look for the Science Buddies website, including a more user-friendly interface and updates to our Teacher Resources section.

- We served over 7 million unique visitors during 2007. That was an increase of nearly 75% over last year. In addition, we saw an increase of nearly 100,000 registered users (note that registration on our website is optional; 10-15% of our total visitors register) on the Science Buddies website, bringing our total for 2007 to 762,781.
- We welcomed Seagate Technology as our first National Presenting Sponsor and enjoyed continuing support from other longtime partners, such as AMD, Bio-Rad Labs, EMC, and Symantec.
- We completed the 2006-2007 seasons of our successful Ask an Expert online advice forum and the pilot mentoring program, Classroom Scientists.
- We were honored as one of only 34 websites selected this year for inclusion in the prestigious Great Web Sites for Kids directory of the **American Library Association**.
- We entered into (non-monetary) partnerships with both **Cyberchase**, the award-winning children's math program on **PBS**, and **Sally Ride Science**, a national science education organization.
- Science Buddies appeared in an article in the **National Science Teachers Association** journal, [Science and Children](#).
- We launched an upgrade with lots of new materials in the Teacher Resource area of our website.
- In early 2007, **AOL** chose Science Buddies to be the behind-the-scenes editor of its homework help section on science fair. See <http://kids.aol.com/homework-help/science-fair-elementary>
- The **PBS series DragonflyTV** entered into a partnership with us to develop Project Idea content for our website, based on video clips from 75 DragonflyTV episodes.
- Our lean organization continued to operate very efficiently, and at a much lower cost per student served than other prominent mentoring and education organizations.

In the following sections, we provide a detailed overview of our 2007 season. While a majority of our programs were successful, we continued to find areas to improve and worked diligently to make those improvements or implement upgrade plans that reflect the changing nature of our visitors. We will continue to solicit feedback from and listen to our visitors, and provide offerings that reflect their needs and help improve their science skills to foster their interest in science and engineering. As we move into 2008, we hope for continued growth and increased participation from students all over the world.

Results of 2007 Programs

Overall Website Traffic

We are delighted to report a significant increase in the number of unique visitors to the Science Buddies website during 2007. Our traffic is primarily generated through regular Internet advertising (with ads placed at search engines); however, we also rely heavily on word of mouth and press coverage. Science Buddies appeared in an article in the National Science Teachers Association journal, *Science and Children*. In early 2007, AOL chose Science Buddies to be the behind-the-scenes editor of its homework help section on science fairs, and the PBS series DragonflyTV entered into a partnership with us to develop Project Idea content for our website, based on video clips from 75 DragonflyTV episodes. Highlights of our website traffic this program year include:

- An increase of nearly 100,000 visitors registered on our Topic Selection Wizard survey, bringing the total to 762,781 in 2006.
- An increase of over 200% in the number of visitors to the Teacher Resource section, bringing the total pageviews to 175,378.
- A new all-time high for the total number of visitors to the website, reaching 7,204,538—nearly twice the number reported during the 2006 season.

Figure 1. Science Buddies Website Traffic Summary¹

Website Traffic	'04-'05	2006	2007
	Program Year	Calendar Year	Calendar Year
Total Visitors to Website	853,093	4,076,114	7,204,538
Total Page Views	6,525,371	28,163,383	46,610,928
Pages Viewed per Visitor	7.6	6.91	6.47
Bytes Transferred (GB)	143.3	1034.2	2263.0
Avg Session Length (Min:Sec)	06:22	06:51	06:33
Visitors Registering for the Topic Selection Wizard	215,353	684,307	762,781
Page views of Teacher Resource Material	18,380	73,213	175,378
International Traffic (approx. percentage of total)	6.20%	15%	16%

Figures 2 and 3 show visitor demographics for our website. The figures are calculated based on the registered users of our Topic Selection Wizard survey (note that registration on our website is optional; 10-15% of our total visitors register). We can apply these percentages to the 7 million visitors to our site, which shows a very diverse usage, with thousands of minority students using our resources. For the first time this season, we saw an increase in middle school visitors, who made up more than 50% of the total visitors to the website during 2007.

¹ Traffic summary information for 2006 and 2007 reflect the change to calendar year reporting and are not an exact match to the months reported during the 04-05 season.
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Figure 2. Science Buddies Website Demographics

Grade Level	%Total	Ethnic Group	%Total
K - 5	27.4%	African-American	11.1%
6	16.3%	Alaska Native	0.4%
7	19.4%	Asian	4.9%
8	18.9%	Asian Indian	2.5%
9	6.8%	Caucasian	32.7%
10	4.3%	Latino-American	10.0%
11	2.4%	Native American	2.0%
12	1.9%	Other	13.9%
Adults	2.5%	Pacific Islander	1.2%
Total	100%	Decline to State	21.3%
		Total	100%

Figure 3. Registrants for the Topic Selection Wizard by State or Region (in alphabetical order by state)

State	Registered Users	% of Total	Index of Usage Per Capita (100 = Avg)	Population
Alabama	4,760	0.8%	50	4,627,851
Alaska	2,297	0.4%	164	683,478
Arizona	13,158	2.1%	101	6,338,755
Arkansas	5,777	0.9%	99	2,834,797
California	69,455	11.2%	93	36,553,215
Colorado	8,188	1.3%	82	4,861,515
Connecticut	4,179	0.7%	58	3,502,309
Delaware	1,217	0.2%	69	864,764
District of Columbia	2,984	0.5%	247	588,292
Florida	75,393	12.2%	201	18,251,243
Georgia	21,472	3.5%	110	9,544,750
Hawaii	3,124	0.5%	119	1,283,388
Idaho	925	0.1%	30	1,499,402
Illinois	27,270	4.4%	103	12,852,548
Indiana	12,277	2.0%	94	6,345,289
Iowa	2,551	0.4%	42	2,988,046
Kansas	2,952	0.5%	52	2,775,997
Kentucky	7,958	1.3%	91	4,241,474
Louisiana	9,365	1.5%	106	4,293,204
Maine	1,709	0.3%	63	1,317,207
Maryland	21,422	3.5%	186	5,618,344
Massachusetts	11,564	1.9%	87	6,449,755
Michigan	14,461	2.3%	70	10,071,822
Minnesota	8,616	1.4%	81	5,197,621
Mississippi	6,823	1.1%	114	2,918,785
Missouri	7,938	1.3%	66	5,878,415

State	Registered Users	% of Total	Index of Usage Per Capita (100 = Avg)	Population
Montana	1,894	0.3%	96	957,861
Nebraska	2,573	0.4%	71	1,774,571
Nevada	4,484	0.7%	85	2,565,382
New Hampshire	1,055	0.2%	39	1,315,828
New Jersey	13,279	2.1%	74	8,685,920
New Mexico	5,316	0.9%	131	1,969,915
New York	34,841	5.6%	88	19,297,729
North Carolina	19,740	3.2%	106	9,061,032
North Dakota	754	0.1%	57	639,715
Ohio	23,102	3.7%	98	11,466,917
Oklahoma	4,654	0.8%	63	3,617,316
Oregon	5,309	0.9%	69	3,747,455
Pennsylvania	20,173	3.3%	79	12,432,792
Puerto Rico	1,002	0.2%	12	3,941,459
Rhode Island	2,516	0.4%	116	1,057,832
South Carolina	13,004	2.1%	144	4,407,709
South Dakota	1,820	0.3%	111	796,214
Tennessee	11,012	1.8%	87	6,156,719
Texas	48,952	7.9%	100	23,904,380
Utah	10,758	1.7%	198	2,645,330
Vermont	730	0.1%	57	621,254
Virginia	22,398	3.6%	141	7,712,091
Washington	14,347	2.3%	108	6,468,424
West Virginia	2,406	0.4%	65	1,812,035
Wisconsin	4,815	0.8%	42	5,601,640
Wyoming	733	0.1%	68	522,830

The Topic Selection Wizard

The Topic Selection Wizard (TSW) addresses the first, and often the largest problem, facing a young scientific investigator: What project should I do? The TSW is the first in a series of tools that will make it easier for students to do meaningful science projects.

During the past year, the number of students registering for the Topic Selection Wizard increased more than three times over 2006 to 762,781, including individuals from every state in the U.S.

The History of the Topic Selection Wizard

In 2001, our founder, Ken Hess, became interested in helping kids participate in the wonderful learning experience of science fairs. Right away, he discovered that many students find selecting a topic to be the most frustrating aspect of doing a science research project. He designed and programmed the TSW to help students with this vexing problem. During the 2003-2004 school year, we made the TSW available to the general public. We were thrilled to see that with only minimal Internet advertising, thousands of students were coming to our website from all over the U.S. and using the TSW. The following school year, with major funding from American Honda Foundation, we embarked upon a project to develop new content and Project Ideas for the TSW. The new version first launched to the public in September 2004 (and additional improvements were completed and released throughout the fall). Upgrades included increasing the capacity of the tool to handle additional users, expanding the number of “fields of science” available to students from 6 to approximately 26, and creating new Project Ideas (bringing the total to 142), which allowed students to narrow down an interest in a topic area to a specific question. As we moved in to 2006, we started work on updates to the TSW recommender engine. Planned upgrades will provide students with more accurate recommendations and Project Ideas that more closely match their area of interest.

Topic Selection Wizard Assessment & Future Plans

During 2007, Science Buddies continued working on upgrades to the TSW. Our staff started to refine the underlying recommender engine so that it will be even more precise and accurate in predicting exactly which Project Ideas from our library will most interest any given student. Upgrades include a shorter survey that will produce recommendations that are more specific and directly related to the students’ interests. We can use student registration on the TSW to evaluate how students are using the survey tool and how they utilize the resources on the Science Buddies website, allowing for personalized suggestions based on their preferences. Other features include a “my favorites” option where students can save Project Ideas that interest them and a “show others like this” option where students are guided to Project Ideas similar to the ones recommended by the survey tool. At the end of 2007, Science Buddies launched the beta version of the new TSW survey tool, allowing visitors to try out the new features and offer feedback about their experience. As we move into 2008, we will evaluate the data collected from the beta version and implement it into the final version of the new TSW survey tool.

Content Development and Upgrades

Overview of the Teacher Resources Content Development Project

With support from Agilent Technologies Foundation in 2007, Science Buddies made significant upgrades to the Teacher Resources section of our website. After years of collecting participant feedback and with the help of experienced teachers and science fair administrators, Science Buddies hired a team of writers to update existing content and develop new content for the Teacher Resources section. Improvements include:

- A Teacher's Guide to Science Projects, which is designed to help teachers prepare, organize, and manage a science project program in the classroom.
- Science Fair Project Grading Rubrics, consisting of teacher-vetted rubrics for each step of a science fair project, from grading the question to evaluating the display board.

The updates and new resources were met with positive responses. In conjunction with the launch of the new teacher resources, Science Buddies, with the support of Seagate Technology, created a Scientific Method classroom poster. The poster is available, free of charge, to teachers and administrators. By the end of December, we had sent out nearly 5,000 classroom posters, and as we move into 2008, we continue to get requests on a daily basis from teachers all over the nation. In addition to the upgrades mentioned above, we started working on a Teacher's Guide to Planning a Science Fair. The guide is an invaluable step-by-step manual loaded with tools, tips, and tricks for those teachers who want to offer their students the benefits of a full science fair event. We will have it completed and available for teachers in 2008. We have also started developing a Quarterly Newsletter to keep teachers, parents, students, and volunteers up-to-date on new Project Ideas, teacher resources, and changes to our website.

Project Ideas

We continued to develop new content for the TSW during 2007. Science Buddies' staff scientists, along with help from volunteers, worked diligently to write, edit, and publish new Project Ideas for the website. By the end of 2007, our staff scientists had developed approximately 300 new Project Ideas and Project Idea Abstracts, bringing the total to 701. Project Idea Abstracts are abbreviated Project Ideas that contain a brief summary of the project and bibliographic references. They are not full Project Idea articles, but they provide students with enough information to research and create their own unique science fair project.

We continued to invite volunteers from our corporate and academic partners to author Project Ideas and we received participation from both individuals and organizations. A team of volunteers from Schering-Plough worked together to author the Project Idea "Bioinformatics – The Perfect Marriage of Computer Science & Medicine." Their project has already been viewed nearly 2,000 times since it was put on the Science Buddies website in late 2007. Celia Cuba, a stylist from St. Louis, Missouri, submitted her Project Idea "The Chemistry of Hair Highlights," which has quickly become one of the most popular projects in the Chemistry Interest Area.

In the fall of 2007, we started a series of Success Stories about students who have used our Project Ideas and resources to prepare for science fairs in their areas. We were inspired by the feedback we received from visitors to our website, like Corynn Evans, a student from San Bernardino, California who used the Science Buddies' Project Idea "Paw Preference in Pets." In conjunction with the Project Idea, Corynn used the Project Guide to complete her project. In the end, she walked away with a gold medal at the RIMS Inland Science and Engineering Fair. As we move into 2008, we will continue to write, and eventually publish, additional Success Stories to our website in the hope that they will inspire other students to use our resources and participate in science fairs in their area.

Website Upgrade

In conjunction with the recent content upgrades to the Teacher Resources section, Project Ideas, and the Topic Selection Wizard survey tool, Science Buddies upgraded the look of our website. During the fall, we rolled out the new website pages. New features include an updated logo and header, user-friendly tabs that guide visitors to the resources they need, a new homepage format with announcements, Project Ideas in Action, and quick-links to the most common resources needed by students and teachers.

While upgrading the look of the website, we took the opportunity to upgrade the user features as well. We added a search tool to each page so visitors can search the entire website in one step. Features such as "Email This" and "Printable Version" were added to each of the Project Idea pages to facilitate communication between students and access to Project Ideas.

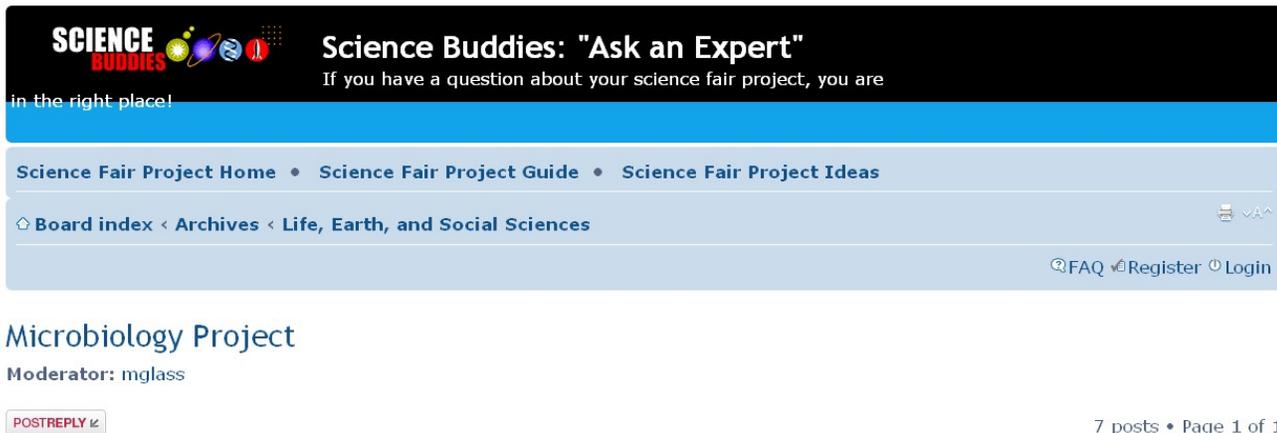
As we move into 2008, we will continue to update and upgrade features on the Science Buddies website to meet the growing demand for expanded content and resources.

Ask an Expert (AAE)

“Ask an Expert” is an online bulletin board staffed by volunteer scientists, engineers, and talented science students who offer their help to anyone regarding science fair project questions. In contrast to our dedicated mentoring programs, which offer help to a limited number of students during certain months of the year, AAE offers drop-in help to any student looking for answers and help with his or her work throughout the year. At the same time, Ask an Expert presents a volunteer opportunity that offers even more convenience and takes less time than our Classroom Scientists Program. During the 2006-2007 academic year, we had 104 volunteers staffing the Ask an Expert Forum, each taking a weekly time slot as their "shift." We divided AAE into five sub-forums where students can post their questions: Physical Science, Math and Computer Science, Life Sciences, Running a Science Fair, and Preparing for the Science Fair, which address questions about judging, how to set up a display board, preparing a presentation, preparing for interview questions, etc. During 2007, we saw even more students visiting the Ask an Expert forum. The Ask an Expert homepage had 238,351 pageviews in 2007, compared to only 48,984 in 2006. In addition to posting new questions for our science Experts, we saw an increase in the number of students viewing past conversation threads. There was a marked increase in the number of visitors to the website coming directly to threads in the Ask an Expert forum, which tells us that students are benefiting from past conversations by other student visitors. We estimate that volunteers responded to over 1,000 questions.

Below are example posts made on the AAE forums, along with a sample of the responses offered by the volunteer Experts. Students post a variety of questions reflecting the range in complexity and diversity of the Project Ideas themselves.

Figure 4. Sample Post from the Life, Earth, and Social Sciences Forum



The screenshot shows the top portion of a forum post on the Science Buddies website. At the top is a black header with the Science Buddies logo (a globe with colorful dots) and the text "Science Buddies: 'Ask an Expert'" followed by the tagline "If you have a question about your science fair project, you are in the right place!". Below this is a blue navigation bar with links for "Science Fair Project Home", "Science Fair Project Guide", and "Science Fair Project Ideas". Underneath is a light blue breadcrumb trail: "Board index < Archives < Life, Earth, and Social Sciences". On the right side of this bar are icons for "FAQ", "Register", and "Login". The main content area begins with the title "Microbiology Project" and the moderator "mglass". At the bottom left of the content area is a red "POSTREPLY" button with a small icon. At the bottom right, it says "7 posts • Page 1 of 1".

Microbiology Project

by [Sully](#) on Thu Sep 06, 2007 5:14 am

I need some help on how to get started on a project involving microbiology.

My idea is to test the antibacterial effects of different brands of regular hand soap compared to brands of actual antibacterial soap.

I need help with:

- What type of bacteria to use (my teacher suggested I use staf. or just swab my hands).

If actual bacteria is suggested, I would like to know the personal risks involved with handling that bacteria.

- How exactly to go about setting up the experiment

I was thinking of simply creating a soapy solution with a controlled amount of water and controlled amount of soap.

Any ideas and suggestions would be helpful.

Thanks!

[Sully](#)

Posts: 4
Joined: Thu Sep 06, 2007 5:02 am

by [Lise Byrd](#) on Sat Sep 08, 2007 2:19 pm

Sully,

Since your teacher suggested different ways for you to get bacteria, I'm assuming that working with bacteria is allowed for your school/ local science fair. Some fairs have rules and extra paperwork for projects that use bacteria.

If you are able to get a culture of a standard bacterium (for example, E. coli), it will reduce the number of variables in your experiment. You can ask your teacher or mentor about ordering a specific strain of bacteria; information about how harmful the bacteria strain is and what it will do to you should be available with the strain.

You can get bacteria from your hands or by swabbing often-used surfaces (like doorknobs or countertops), but you will culture many different kinds of bacteria, and they may not respond to your treatments in the same way. This may not be an issue, though, if you want to ask the broader question of whether antibacterial soap will kill more bacterial strains than non-antibacterial soap.

The Science Buddies website contains several project ideas similar to yours. These pages may give you ideas for how to proceed with your project:

<http://www.sciencebuddies.org/mentoring...?from=Home>

<http://www.sciencebuddies.org/mentoring...?from=Home>

Post again once you have a rough idea of your procedure, and we can look it over for you. You are also welcome to post if you have other questions.

Hope this helps!

Sonia

[Lise Byrd](#)

Former Expert

Posts: 91
Joined: Sun Sep 18, 2005 10:00 pm

by [Sully](#) on Sat Sep 08, 2007 7:28 pm

Thank you so much Sonia!

[Sully](#)

Posts: 4
Joined: Thu Sep 06, 2007 5:02 am

Figure 5. Sample Post from the Preparing for a Science Fair Forum

The screenshot shows the top section of a forum page. On the left is the Science Buddies logo with a globe icon. To its right is the text "Science Buddies: 'Ask an Expert'" and "If you have a question about your science fair project, you are in the right place!". Below this is a blue navigation bar with links: "Science Fair Project Home", "Science Fair Project Guide", and "Science Fair Project Ideas". A secondary navigation bar contains "Board index", "Archives", and "Life, Earth, and Social Sciences". On the right side of the navigation bar are icons for "FAQ", "Register", and "Login".

Yeast repiration

Moderator: mglass

POSTREPLY ↻

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Yeast repiration

by Izzi on Sat Oct 13, 2007 9:05 am

I am conducting the aerobic and anaerobic yeast respiration experiment. I have run the experiment 10 times for each respiration type and I have the results. I hypothesized that because yeast metabolism of sugar in the presence of oxygen is more efficient and more energy is derived that it would produce more CO₂. However my data shows the opposite to be true. The anerobic respiration produced 100ml of CO₂ in less time than the aerobic respiration. I want to know if these results are correct. Please help. Thank you

Izzi

Posts: 3
Joined: Tue Oct 09, 2007 9:48 am

by MelissaB on Sat Oct 13, 2007 9:27 am

Izzi,

In science, there are not 'correct' answers--there's only what you observe. You did the experiment and obtained your results, and they are perfectly valid results. Some of the most important discoveries in science--including antibiotics!--came from results other people would consider 'incorrect' or that the scientists did not anticipate.

What you need to think about now are the potential explanations for your results. Some of them have to do with the organisms themselves, and others with the experimental setup. For example, the experiment instructions might not tell you how much air to leave in your -air bottle; if you left a lot your anerobic conditions might not have been as anerobic as you thought they were! On the other hand, it may be that yeast do produce more CO₂ under anerobic conditions...but is that what your experiment really measures? I would argue that it tells you something about the rapidity of the CO₂ production but not necessarily the amount (if I'm reading your post correctly). Could it be that under anerobic conditions the yeast metabolize faster, but in the end metabolize less?

MelissaB
Expert

Posts: 284
Joined: Mon Oct 16, 2006 11:47 am

AAE Assessment and Future Goals

At the end of 2007, as part of our general upgrades, we replaced the existing Ask an Expert bulletin board software with a newer version. The new software proved to be more convenient and user-friendly. We successfully divided the existing forums into grade-level categories for the benefit of students and volunteers. With the new grade-level division, we were able to help volunteers better understand their audience and to ensure that student visitors received responses appropriate for their level of understanding. The division of the forums also meant fewer spam messages, which had been an issue in previous years. The updated format is still very new and we are working with volunteers and participants to ensure that it runs smoothly.

As we move into 2008, we plan to assign moderators to each of the forums. The moderator role will be given to experienced volunteers with a history of active participation and a desire to provide the best information possible to visitors. We will continue to evaluate traffic and make updates to meet the ever-changing needs of students, parents, teachers, and volunteers.

Classroom Scientists Program (CSP)

During the beginning of the 2006-2007 mentoring season, we made changes to the former Ask an Expert Mentoring Program (AAEMP) to develop the Classroom Scientists Program. The updated format was created as a way to maximize our volunteers' efforts by grouping them with students guaranteed to use the program, while still benefiting those students who weren't as active in the forum. The new format allowed for the same student and volunteer interaction, but provided students with a secure Online Classroom where they could openly communicate with other students. In addition, the program had a number of added features that were not previously available in the AAEMP format, such as links to the Project Guide and other resources, the ability to upload documents for review, project-evaluation forms, and a "due date" calendar that allowed both students and volunteers to stay on track. We set goals for what information we hoped to obtain by studying the CSP groups' usage of Science Buddies' resources and tools. The primary goal of the Classroom Scientist Program was to get feedback about our online resources from teachers and students. In addition, we hoped that it would create a learning community where students could support each other and get advice from experts. The new format consisted of a semi-private forum, called an Online Classroom, which housed a Discussion Board Index (similar to that used in the Ask an Expert advice forum) where students, called Investigators, could post questions for their volunteer Mentors (both adult science professionals and top high school students) and where they could communicate with each other about their projects. In addition to the Discussion Board Index, the Online Classroom also mirrored the Science Buddies website and allowed students direct access to all the same resources available on the public site, such as the scientific method resources and our library of Project Ideas.

Classroom Scientists Program Recruiting and Training

After careful evaluation, we decided that we wanted to have about 20 groups, for a total of around 400 students. We established criteria for selecting classroom groups for participation, including: students who had the ability to select the topic of their project; teachers who did not have an existing science fair guide in use; and students who had regular access to the Internet at home and/or in a computer lab. We developed a teacher contract in order to ensure that key program rules and guidelines would be followed (for example, it was absolutely critical that student participants begin the program by first using the Topic Selection Wizard). In the contract, we promised to provide students with direct access to mentors (both high school and adult science professionals) and we promised to provide teachers with grading rubrics and science fair scheduling tools to ease the burden on them during the busy science fair season. In return, we asked teachers to obtain signed permission slips from their students, allocate time in the classroom for their students to access the Online Classroom, and submit the students' grades over the course of the science fair. We initially had trouble getting teachers to commit for a variety of reasons. A number of teachers were concerned about the extra planning and commitment required to involve themselves and their students for the duration of the program, and quite a few were concerned about their students' willingness to participate in an auxiliary program outside the required classroom assignments. Eventually, we were able to sign up 11 teachers for a total student audience of 399, which represented 24 Online Classrooms.

A combination of high school volunteers and adult scientists teamed up to support the Online Classrooms. Volunteers were assigned in groups of 3-5 individuals and worked with an Online Classroom for the duration of the science fair season. A total of 95 volunteers responded to questions on a daily basis. They worked with students in the Online Classroom by directing them to resources available on the Science Buddies website, reviewing the work that was uploaded to the Online Classroom, and guiding them through all of the steps of the scientific method.

Classroom Scientists Program Assessment and Future Plans

The primary goal of the Classroom Scientists Program was to collect and measure data on how students were using the Science Buddies website. It was our goal to collect feedback from student and teacher participants about our online resources. Overall, that goal was met with mixed results. Early into the season, we saw a decrease in activity in some Online Classrooms. Although we attempted to increase activity within the

program as a whole, some Online Classrooms were shut down. Fortunately, we were able to evaluate those Online Classrooms that did participate for the duration of the program. We saw the greatest amount of traffic to our Topic Selection Wizard, due mostly to the fact that it was a required part of participation in the program. Second to the TSW homepage, the Bibliography page was the most-visited resource page. Below is a table outlining the pageviews for each of the resource homepages utilized by participating students.

Figure 6. Pageview Statistics for Classroom Scientists Program Participants

Resource Homepages	Total Pageviews
Topic Selection Wizard	403
Project Guide – Bibliography	320
Project Guide – Review of Literature	199
Project Guide – Variables	140
Project Guide – Research Paper	138
Project Guide – Question	135
Project Guide – Materials & Procedure	112
Project Guide – Scientific Method	92
Project Guide – Display Board	74
Project Guide – Data Analysis	65
Project Guide – Conclusions	56
Project Guide – Experiment	46
Project Guide – Sample Research Paper	41
Project Guide – Judging	21
Project Guide – Science Fair Supplies & Materials	18
Project Guide – Science Fair Standards	13
Project Guide – Engineering & Programming Project Tips	11
Project Guide – Scientific Review Committee	7
Total Views	1,891

As you can see from the table above, students participating in the Classroom Scientists Program viewed a large selection of resources. Our teacher participants were also helpful in gaining feedback about our resources and materials. Teachers utilizing the grading rubrics we provided gave us feedback about their features. With their feedback, as well as with feedback from other teachers, our staff created the Science Fair Project Grading Rubrics, which were launched in the fall of 2007 along with the other Teacher Resource updates.

During the fall of 2007, we made the decision to suspend the Classroom Scientists Program. The program required more managerial resources than we could allocate, given our small staff. Instead, we decided to pool our resources into developing additional content for our website. We continued to offer the Ask an Expert program as an alternative mentoring environment where students could still work with Experts to get advice as they work on their science fair projects. As we move into 2008, we will focus on our existing programs and resources. While we may opt to provide a mentoring program similar to the Classroom Scientist Program in the future, we are not actively pursuing that goal at this time.

Selected Participant Feedback (All Programs)

"Your website is great! It has helped my sixth-grade students get ideas for their science fair project this year. I particularly liked the Topic Selection Wizard, as it helps the students narrow their focus for a project." **Elizabeth Leach, Almond School, Los Altos, CA**

"I just discovered your website. It is hands-down the best science fair web site out there. Thank you for this tremendous resource!" **Kirsten Rohrbach, Denny Middle School, Seattle, WA**

"Thank you so much for this wonderful resource, and continue working toward making it an ongoing wealth of information where the inexperienced and experienced may go for direction and/or information about a science fair." **Pat Haynie, Caddo Middle Magnet School, Shreveport, LA**

"Thank you, thank you, thank you!!!!!! This is the best site I've seen for science fair info for a first-year teacher." **Norma Jean McLaughlin, John L. Chapin High, El Paso, TX**

"Thank you, Science Buddies team, for your terrific website. I am teaching an eighth-grade science class and needed some research scenarios to do an activity in which the students recognize variables, develop a purpose question and hypothesis, think about background research, and what kinds of data/graphing/conclusions they could draw. Your resources helped me pull together some real examples to look at! Thank you very much." **Susan Jankowski, Science Teacher**

"This website is a fantastic resource. Our school has not held a science fair for many years. With this resource, I feel that I will be on the right track when school begins mid August. Thank you for this valuable free information." **Cathy Coleman, Science Teacher**

"Wow, what a great site! I can hardly wait to show it to the kids in our science fair club. It should really help us as mentors and them as participants to pick some great topics, learn, and produce an excellent project. Thanks for all of the effort you have put into your site. Makes our lives much easier!!!" **Pat Prosser, Club Leader, Winnipeg, Manitoba, Canada**

"Thank you so very much for all the information and forms I can use to help my students with their projects. Your site has been a tremendous help for us." **Jeannie Bayles, Science Teacher**

"I am the Science Resource Teacher (Grades K-6) in a Science/Technology Magnet School. We take our science fair seriously and find your site a great resource. I have used your site for several years and it gets better and better. I downloaded several of your handouts—specifically the rubrics and checklists, as well as some other sheets. Most of my fifth and sixth graders will be using part of or all of your Topic Selection Wizard. Several seventh and eighth graders have told me they will also use the TSW as well. Thanks for the great support! Every good science fair needs lots of support." **Tricia Maloney, Science Teacher**

Student Awards & Recognition

Science Buddies Awards to High School Volunteers

Science Buddies gives out a variety of award to recognize the outstanding efforts of high school volunteers in our Ask an Expert and Classroom Scientists Programs. Each Outstanding Expert Award winner received a personalized certificate, an award letter, and a \$300 scholarship. Honorable Mention Award winners each received a personalized certificate, an award letter, and a 5G Pocket Drive, sponsored by Seagate Technology. All other Mentors who completed the program received a personalized letter detailing their involvement in the 2006-2007 program, including the number of hours spent online, which can be counted toward their community service requirement at their schools.

School	Student Name	Award
Henrietta High School (Henrietta, TX)	Philip Pierce	Honorable Mention Award
Mission San Jose High (Fremont, CA)	Tarang Srivastava	Honorable Mention Award
Monte Vista High (Danville)	Tara Templin	Honorable Mention Award
Monte Vista High (Danville)	Kathleen Kimball	Honorable Mention Award
Oak Grove High School	Terik Daly	Outstanding Expert Award

State and National Science Competition Participants & Winners

In 2007, we saw continued science fair success from student volunteers and participants. One of the most rewarding aspects of working with students across the nation is reporting their success as they participate in local, regional, and national science competitions. Science Buddies had the honor of attending a number of local and regional science fairs and we were delighted by the number of students who had used our resources and/or participated as volunteer mentors on the website and gone on to win awards at those fairs. Below are some of the high school participants (both volunteers and student visitors) who competed in top science competitions across the nation.

Terik Daly

"Chemical Aspects of the Impact Process"

Intel International Science & Engineering Fair (ISEF)

- 2nd Place award of \$1,500 from the Geological Society of America
- 2nd Place award of \$500 from the American Statistical Association
- 2nd Place award of \$250 from the American Geological Institute
- Award of Merit of \$250 from the Society of Exploration Geophysicists

Yihe Dong

"Maternal Effects of Diet Restriction in Fruit Flies"

Intel International Science & Engineering Fair (ISEF)

- Best of Category, award of \$5,000 for Intel ISEF Animal Sciences sponsored by New Mexico State University
- 1st Place award of \$3000 in Animal Science

Richard Li

"A Novel Approach to Rapid Diagnosis of Cancer"

Intel International Science & Engineering Fair (ISEF)

- 4yr Scholarship Award of \$5,000 and summer internship with a \$1,000 stipend from the Albany College of Pharmacy of Union University
- Tuition Scholarship of \$120,000 from Drexel University

Justin Spahn

"Airfoil Efficiency as Determined by Camber"

Intel International Science & Engineering Fair (ISEF)

- Participant

Amy Tai

"Computational Prediction of Genes in the Human Genome Using Nucleotide Composition"

Intel International Science & Engineering Fair (ISEF)

- Participant

JinJu Yi and Vijay Jain

"An Integrated Smart Chip for the Early Diagnosis of Cancer: A New Take on Surface Molecular Imprinting"

Intel International Science & Engineering Fair (ISEF)

- 1st Place award of \$3000 in Biochemistry
- Team Award of \$1000 from the United States Air Force
- Savings Bond award of \$1000 from the United States Army
- Scholarship Award of \$20,000 from the Department of Homeland Security, University Programs Office

Alexandra Courtis

"Bright, Luminescent Silicon Nanoparticles for Biological Applications"

Intel International Science & Engineering Fair (ISEF)

- 2nd Place award of \$1,500 in Chemistry
- 2nd Place award of \$1,500 from the United States Air Force
- Scholarship Award of \$1,000 from the National Collegiate Inventors and Innovators Alliance/The Lemelson Foundation
- Honorable Mention Award from the American Chemical Society
- All-expense-paid trip to Taiwan to attend the Taiwan International Science Fair



Student participants in the 2007 Tri Valley Science and Engineering Fair in Livermore, CA.

Ask an Expert Participating Schools & Employers

High School Expert Schools

Participating Schools	County or [State]	Participants
Amador Valley High School	Alameda	1
Benicia High School	Solano	1
Burlingame High School	San Mateo	3
California Academy of Mathematics and Science	Los Angeles	1
Clayton Valley High School	Contra Costa	1
College Preparatory School	Alameda	1
De La Salle High	Contra Costa	3
High Technology High School	[New Jersey]	1
Highlands Ranch High School	[Colorado]	1
John Swett High School	Contra Costa	1
Live Oak High School	Santa Clara	1
Lynbrook High School	San Mateo	1
Maranatha High School	Los Angeles	2
McIntosh High School	[Georgia]	1
Mission San Jose High (Fremont)	Alameda	1
Monte Vista High (Danville)	Contra Costa	14
Oak Grove High School	Santa Clara	1
Pacific Grove High School	Monterey	1
Plainview Old Bethpage JFK High School	[New York]	3
Quarry Lane School	Alameda	1
Red Bank Regional High School	[New Jersey]	1
Redwood High School	Marin	5
Salinas High School	Monterey	1
San Jose High Academy	San Mateo	1
Stevenson School	Monterey	1

High School Totals by County or [State]	
[Colorado]	1
[Georgia]	1
[New Jersey]	2
[New York]	3
Alameda	4
Contra Costa	19
Los Angeles	3
Marin	5
Monterey	3
San Mateo	5
Santa Clara	2
Solano	1
Total Mentors	49

Adult Expert Employers

Advisor Organization	Participants
Advanced Anesthesia Specialists	1
Advanced Micro Devices, Inc.	1
Albert Einstein College of Medicine	1
Bio-Rad	1
California Department of Fish and Game	1
California Department of Health Services	1
California Integrated Waste Management Board	1
Collin County Community College	1
Contra Costa Water District	1
Doodlebug Prints	1
Dow AgroSciences	1
EMC Corporation	1
In Silico Studios	1
Lawrence Livermore National Laboratory	2
Massachusetts College of Liberal Arts	1
Merck & Co., Inc.	1
Motorola	1
National Semiconductor	2

Advisor Organization	Participants
Ohio Wesleyan University	1
Penn State Cancer Institute	1
Rembold Companies	1
Rocky Mountain Laboratories	1
SF Bay Area Rapid Transit	1
SRI International	1
Stanford University	1
Sun Microsystems	1
Symantec	14
UC Berkeley	1
UC Los Angeles Emergency Medicine Center	1
UC San Francisco	1
UC Santa Cruz	1
University of Montana	1
University of Pennsylvania	1
US Geological Survey	1
Other (retired, independent, etc.)	3
Total Experts	52

Classroom Scientists Program Participating Schools & Employers

Investigator Schools

Participating Schools	County or [State]	Participants
Bailey Middle School	[North Carolina]	15
Belding Middle School	[Michigan]	38
Belding Middle School	[Michigan]	45
Dempsey Middle School	[Ohio]	73
Foothill Farms Junior High School	Sacramento	28
Los Coyotes Middle School	Los Angeles	36
Mayflower Middle School	[Arkansas]	24
Millville Elementary School	Shasta	17
PEARLS Hawthorne School	[New York]	103
Pelham Memorial High School	[New York]	14
Plainview Old Bethpage JFK High School	[New York]	27
Totals by County or [State]		
	[Arkansas]	24
	[Michigan]	83
	[New York]	144
	[North Carolina]	15
	[Ohio]	73
	Los Angeles	36
	Sacramento	28
	Shasta	17
Total from Underserved Communities		
Students from schools with greater than or equal to 25% of students qualifying for free lunch program (we collect no such information from individual students) ²		328
Total Investigators		420

Mentor Schools

Participating Schools	County or [State]	Participants
Arroyo High School	Alameda	1
Bayonne High School	[New Jersey]	1
Choate Rosemary Hall	[Conneticut]	1
De La Salle High	Contra Costa	1
Deer Valley High School	Contra Costa	1
Dempsey Middle School	[Ohio]	2
Dr. Michael Krop Sr. High	[Florida]	1
Forest Hill High School	[Florida]	1
Henrietta High School	[Texas]	1
John Swett High School	Contra Costa	1
Leonia High School	[New Jersey]	1
Mission San Jose High (Fremont)	Alameda	1
Monte Vista High (Danville)	Contra Costa	8
Northgate High School	Contra Costa	1
Notre Dame High	Santa Clara	1
Plainview Old Bethpage JFK High School	[New York]	2
Redwood High School	Marin	5
Rutherford B. Hayes High School	[Ohio]	6
Saint Andrew's School	[Florida]	1
San Ramon Valley High	Contra Costa	1
Shadyside High School	[Ohio]	1
Stevenson School	Monterey	1
Winston Churchill High	[Maryland]	1

High School Totals by County or [State]	
[Conneticut]	1
[Florida]	3
[Maryland]	1
[New Jersey]	2
[New York]	2
[Ohio]	9
[Texas]	1
Alameda	2
Contra Costa	13
Marin	5
Monterey	1
Santa Clara	1
Total Mentors	41

² Calculated based on statistics from www.greatschools.net
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Advisor Employers

Advisor Organization	Participants
Advanced Micro Devices, Inc.	5
Aerospace Corporation.	1
Atmel Corp.	1
Avnera Corporation	1
Battelle	1
Bio-Rad	1
Central Valley Water Quality Control Board	1
Cornell University	1
Debra L Banks Consultants	1
Department of Parks and Recreation	1
EMC Corporation	2
Hewlett Packard	1
Hollywood Presbyterian Medical Center	1
Hyperion Solutions	1
Intel Corporation	1
James Pearson Salon	1
MIRA	1
NASA-Ames Research Center	1
PPG Industries	1
Princeton University	2
Regional Water Board	1

Advisor Organization	Participants
SBC Long Distance	1
Seagate Technology	1
State Water Resources Control Board	3
SUNY Downstate Medical Center	1
Symantec	1
Synaptics, Inc.	1
UC Irvine	1
UC San Diego	1
Universal Hospital Systems	1
University of Rochester	1
University of Tennessee	1
US Air Force	1
US Geological Survey	1
USDA Forest Service	1
UT Austin	1
Vanderbilt University	1
Ventura County Sheriff's Department	1
Vertical Communications	1
Other (retired, independent, etc.)	3
Total Advisors	50

Calendar Year 20076 Financial Summary

Science Buddies is a very lean organization. The president, Ken Hess, takes no salary, and all other employees operate from home offices or donated office space, keeping overhead expenses at an absolute minimum.

Figure 11. Calendar Expenses

Revenues

Source	Amount	Notes
Corporate grants	\$754,331	Includes about \$280,000 of in-kind gifts
Dividends and interest from securities	\$5,449	
Total Revenues	\$760,129	

Expenses

Budgeted item	Amount	Notes
Total Salaries	\$349,309	Our CEO volunteers full-time
Employment Taxes	\$27,306	
Health Insurance	\$6,454	
Worker's Comp	\$4,624	
Human Resources	\$1,455	
Professional Fees	\$4,598	
Accounting Fees	\$1,465	
Taxes	\$130	
Bank Fees	\$760	
Personnel Screening	\$363	Background checks on employees and volunteers
Programming	\$40,495	
Rent Depreciation	\$0	Our office space is donated
Consulting	\$33,375	
IT Consulting	\$450	
Advertising	\$290,655	Most of this is donated in-kind
Outreach Consulting	\$800	
Internet	\$35,396	
Graphic Arts	\$3,700	
Other Insurance	\$6,770	
Depreciation	\$9,324	
Participant Awards	\$630	
Misc. Office Expenses	\$10,872	
Misc.	\$202	
Affiliate Income	\$349	
Total Expenses	\$829,482	

Category Breakdown

Source	Amount
Program expenses	\$763,123
General expenses	\$11,058
Fundraising expenses	\$55,297
Total	\$829,482

Fundraising Summary

Science Buddies continued to enjoy generous support from dozens of corporate sponsors whose donations funded the majority of our operating budget. As in prior years, enlisting corporate support was the focus of our fundraising strategy. Science Buddies received grants or in-kind donations from the following organizations in 2007:

National Presenting Sponsor (\$150,000)

Seagate Technology

Darwin Level (\$30,000 – \$49,999)

Bio-Rad Laboratories

Symantec

Yahoo Employee Foundation

Newton Level (\$20,000 – \$29,999)

Agilent Technologies Foundation

Salk Level (\$15,000 – \$19,999)

AMD

MedImmune

Edison Level (\$10,000 – \$14,999)

EMC Corporation

PG&E

Galileo Level (\$5,000 – \$9,999)

Applied Biosystems

Beckman Coulter

Biogen Idec Foundation

Hyperion Solutions

Lockheed

National Semiconductor

Novellus

OSI Pharmaceuticals Foundation

PMC-Sierra

SanDisk

Curie Level (\$1,000 – \$4,999)

F5 Networks

Genencor International

Intersil

Qualcomm

Raytheon SAS

Xilinx

Pasteur Level (>\$1,000)

Synaptics

Donations in Kind

AOL

Avis

Google

Plantronics

Polycom

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