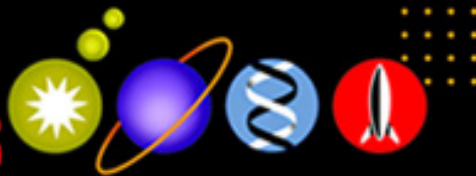


SCIENCE BUDDIES

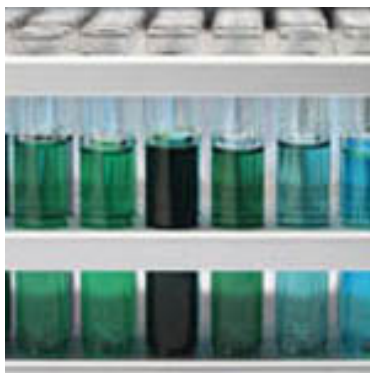


Science Buddies Project Ideas Roundup September 2009

Whether you want to investigate alternative sources of energy, delve into the field of biotechnology, or want to know how science ties into your everyday life, you'll be intrigued by these new Project Ideas from Science Buddies!

Two Biotechnology Project Ideas... Written by Students!

Two high school seniors at Tracy Joint Union High School in Tracy, California, recently authored Project Ideas for Science Buddies. Jeffrey Susila and Xiomara Fonseca, in Kirk Brown's Advanced Biology and Biotechnology classes, respectively, developed their own cutting-edge biotechnology science projects, based on products from Bio-Rad's Biotechnology Explorer kits.



Check out the projects for yourself!

[Sizing It Up! How Scientists Separate Proteins](#)

Difficulty: 7-9 (Grades 8-12)

In this science fair project, you'll use size-exclusion chromatography (SEC) to approximate the size of green fluorescent protein (GFP). Because of its fluorescent properties, it is often used in cellular and molecular biology to track the expression of genes and the location of other proteins.

In biotechnology labs, it is important to know the actual size of proteins and their relationship to other proteins, and SEC is a commonly used application that fulfills this requirement. When producing recombinant drugs, such as insulin, biotechnicians use SEC to separate out very small contaminants from the desired protein or drug.

[No Whey! Milk Protein Content Doesn't Change...Or Does It?](#)

Difficulty: 9 (Grades 11-12)

Fueling Our Future



In an era of increasing energy needs, the world needs more talented geoscientists and alternative energy experts. [Chevron Corporation](#) recently awarded Science Buddies a generous grant to support the development of new Earth science-related Project Ideas. Chevron is the world's leading producer of geothermal power. It's also investing in solar energy, biofuels, and other emerging energy sources. Our staff scientists hope to tap into Chevron's expertise to publish more cutting-edge Project Ideas, like these, over the next year.

[Biodiesels: Converting Oil into Clean Fuel](#)

Difficulty: 8-10 (Grades 10-12)

This featured project was written by Dr. Annaliese Franz (a researcher funded by Chevron) and Megan Danielewicz, from the Department of Chemistry, University of California - Davis. In this energy science fair project, you will make biodiesel using several different types of oil, researching different ways to make biodiesel and the best oils to use.

[Go Green by Growing Green: How to Extract Energy from Grass](#)

Difficulty: 4 (Grades 5-6)

In this energy science fair project, you will learn more about biomass energy. You will grow three kinds of grasses and see which kind produces the most biomass.

More biomass means more energy. Do some grasses grow faster than others? Do some grasses grow taller than others? This energy science fair project will help you figure out the answers to these questions.



[Burning Biofuels: Comparing](#)

Milk is critical for the healthy development of all young mammals, including humans. In this science fair project, you will analyze the protein composition of cow's milk during different stages of lactation. Does the total protein level change? How about the quantity of casein versus whey protein?

In the field of nutrition, analyzing the protein content and understanding the composition of milk is critical for formulating dietary supplements, such as infant formulas. Think about the infant animals raised in zoos or human infants that rely upon formula--if the protein content isn't correct, there could be dire consequences for the growing infant!

[Biotechnology Explorer](#) is the life sciences education program run by Bio-Rad, which offers a wide range of teacher resources and educational products at discounted education prices. Bio-Rad is a sponsor of both Science Buddies and of the Advanced Biology & Biotechnology courses at Tracy Joint Union High School. Development of these two high-quality Project Ideas--validated by students for students--is a result of the collaboration between Science Buddies, Bio-Rad, and Tracy Joint Union High School. Development of educational materials and ideas always works better as a team effort!



Build Your Own Wind Tunnel

If you're looking for a do-it-yourself project, Science Buddies has developed a thorough how-to guide, [How to Build and Use a Subsonic Wind Tunnel](#). It is excellent for classroom use and for science fair projects. Once you've completed the wind tunnel, Science Buddies has several aerodynamics-related Project Ideas that require the use of a wind tunnel, like [Which Wing Design Creates the Greatest Lift?](#) and [Winglets in Wind Tunnels](#).

From Game *Play* to Game *Design*



The leap from playing video games to programming video games isn't necessarily a big one. Even elementary school students who enjoy filling some down-time with a favorite game can begin exploring the logic and sequencing involved in designing a video game.

Encourage your students to work on mapping out a storyboard as they think through the premise (or plot) of their game. *Who are the main characters? What is the goal? What kinds of problems will be encountered? What skills do you need to win?*

Answering these questions is an important first step and encourages solid grounding in "process-oriented thinking." It's easy to envision A, D, and Z, but what steps happen in between? If a storyboard for a video game ends up looking like a massive flow-chart filled with conditional if-then statements (*if this happens, then this will happen*), they are on the right track!

Nonrenewable and Renewable Fuels

Difficulty: 4 (Grades 5-6)

Agrofuel is a type of biofuel and is a form of renewable energy. There are disadvantages, however, to using agrofuels. Agrofuels compete for land and resources with other crops that are grown solely for food. In this energy science fair project, you will determine if equivalent amounts of a renewable agrofuel (fresh vegetable oil) release the same amount of heat energy as a nonrenewable fuel (motor oil) to heat water.

Sweet Science?

Difficulty: 2-3 (Grades 2-4)

This summer's *Aliens in the Attic*, a movie full of science-inspired fun, includes a Mentos® bottle rocket. Unlike baking soda and vinegar volcanoes, which depend on a *chemical* reaction, Mentos-based rockets involve a *physical* reaction. Our Project Idea [Coke® and Mentos - Nucleation Goes Nuclear](#), will show you how to turn popular bottle rockets into a truly explosive classroom or backyard experiment. It's sure to inspire you to learn about chemical versus physical reactions, surface tension, and more.

Newly Released Science Fair Project Ideas



Looking for something new?

The following Project Ideas were recently added to the Science Buddies library:

Difficulty: 3-4 (Grades 4-6)

- [Crazy Crystal Creations: How to Grow the Best and Largest Crystals](#)

Difficulty: 5 (Grades 6-7)

- [Perfecting Pastries: The Role of Fats in Making a Delicious Pastry](#)
- [Stop Slumping: What Makes Foams Stand Up Straight](#)
- [To Infinity and Beyond: Plan a City of the Future with Sim City](#)

Difficulty: 5-7 (Grades 6-9)

- [Enjoy It Now...Or Enjoy It Later? Understanding Delayed Gratification](#)
-

Explore first steps in game programming with the [Want To Make a Video Game? Here's How!](#) Project Idea. Difficulty: 5-7 (Grades 6-9)

For other game-inspired Project Ideas, visit our [Video and Computer Games Interest Area](#), which is sponsored by the AMD Foundation.

(excerpted from the [Science Buddies Blog](#))

[Paintball Ballistics](#)

Difficulty: 7-9 (Grades 8-11)

- [Wire Wilt: How Light-Emitting Diodes Fade As Temperature Increases](#)

Science Buddies Featured on Local Daytime Show

Science Buddies was recently featured on the San Francisco-based TV show, *View from the Bay*. Demonstrating the [Cabbage Chemistry](#) Project Idea with her son and another mother-child pair, Science Buddies vice president Courtney Corda offered tips for relating science to your everyday life. Watch the [video clip](#) on the Science Buddies blog.

Keep in Touch with Science Buddies

Check out the [Science Buddies blog](#) to find even more ways that our science fair project ideas tie in with science in the news, in the movies, and around you day to day. Mark yourself a "fan" of [Science Buddies at Facebook](#) to easily track our updates.



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