

## A Life-Saving "Beat"

*Hands-only CPR saves lives*

Everyone knows that CPR can save a life, but not everyone knows CPR. And not everyone is willing to perform mouth-to-mouth CPR on a stranger.

There is another option, however, one with a fast-paced beat that can mean the difference between life and death. **Continuous chest compression CPR** is a **hands-only technique** that can be as effective as mouth-to-mouth CPR. But successful hands-only CPR requires a pace of 100 compressions per minute. *That's fast!* Having the right song in your head can help you keep the beat, and the American Heart Association (AHA) has reported success with classic songs like "Staying Alive," by the Bee Gees. You can find [a list of other CPR-friendly songs](#) on the Be the Beat website, sponsored by the Medtronic Foundation. With titles listed by artists ranging from the Black Eyed Peas to Bon Jovi and ABBA, *everyone* can find a familiar song to have in mind in case of an emergency.



## Spreading the Word

*Students can apply point-and-click Scratch programming skills to develop a training and awareness-building application*

There are over 300,000 cases of cardiac arrest each year, and yet survival rates often bottom out at 1 in 10. Educating the public about hands-only CPR can make a difference. In the [Save a Life! Teach Hands-Only™ CPR](#) human health and biology project, students will learn more about CPR and will use what they learn to design a software application that can help teach others to *keep the beat*. Using the free Scratch programming environment, students can create an application that might, someday, help save lives. (Difficulty: 5-7)

*(Science Buddies' [human biology & health](#) Project Ideas are sponsored by the Medtronic Foundation)*

## New Year, New Awareness

*What kinds of environmental changes will you make this year?*

Did you make New Year's resolutions? Did you vow to eat healthier or exercise more?



Self-improvement is always a focus at the start of a new year, but January is also a perfect time to think about our impact on the environment and the choices we can make, day to day, that can help conserve resources. Understanding the issues and the ways in



## New Summer Science Camp Resource

*Find out more about the benefits of science-based summer programs*

Science Buddies is excited to announce the launch of a new [Summer Science Camp resource](#), sponsored by the Motorola Foundation. Many camps offer early

which small decisions can add up is an important first step in being smarter about the environment. The following Science Buddies projects help students see firsthand what's going on, especially in our high-tech households.

### Printer Smarts

*When paper-free isn't an option, there are still "green" choices you can make*

It's not always practical to "not" print. We're used to having paper copies of materials, and sometimes you really *need* a printout to carry with you. In the [Printing Power! Save the Environment. One Printer Page at a Time](#) computer science project, students can investigate how changing printer options can help cut down on paper waste. *Do you really need to double-space that?* (Difficulty: 2)

### Hidden Energy Suckers

*Even if it's not being used, something that is plugged in may be zapping your power bill*

Do you conscientiously flip off lights when you leave a room? What about the Internet radio that goes to standby on its own? Do you shut it down? Is your DVD player on even when you're not home? Our houses are filled with appliances and peripherals that are smart enough to go into a standby state but that still draw on the power if they are not fully shut down. Students might be surprised when they add up all the power silently being sucked away. In the [Killing 'Vampires': Saving Money and Power by Turning Off Computer Peripherals](#) computer science project idea, students can analyze power consumption of various peripherals and come up with a conservation-minded plan for better managing high-tech equipment. *Food for thought: is flipping a surge protector switch off enough?* (Difficulty: 5)

*(Science Buddies' [computer science](#) Project Ideas are sponsored by the Symantec Foundation. Support for continued project development in areas that explore natural resources, pollution, energy, and the relationship between the environment and technology comes from the Intel Foundation.)*

### Stir the Pot

*Making the most of thermal energy transfer*

What's the secret to quickly and evenly

registration pricing, so now is the time of year to look into exciting science-based opportunities in your area!

### Science Careers: Chain of Life

Do you have students interested in **saving lives** and **finding ways to prolong and improve the quality of life**? Both [physicians](#) and [paramedics](#) are



vital "*chain of life*" career tracks. Our in-depth career profiles can help students learn more about what it's really like to work in these challenging fields.

To browse our full listing of career profiles, visit the [Careers in Science index page](#).

### Scientist's Pick

#### Tackling Global Water Contamination

*Clean water is a luxury many of us take for granted*

Staff scientist, Michelle Maranowski presented the [From Contaminated to Clean: How Filtering Can Clean Water](#) environmental engineering project last month to Science Buddies staff. With [recent outbreaks of cholera](#) around the world, the issue of water purification, and the risks associated with contaminated water, remains a critical concern. As Michelle shows in this project, understanding the process of purifying water through filtration is something students can see and explore firsthand. (Difficulty: 4)

*(Science Buddies thanks the Intel Foundation for its support of project development in areas of environmental engineering.)*

### Professional Development for Teachers

#### 2011 Earthwatch Program

*Giving teachers an immersive science experience*

Applications are being accepted for the 2011 Earthwatch Educator Program. The program, sponsored by Earthwatch and Northrop Grumman, awards lucky middle school teachers the chance to explore current science issues firsthand and as part of an on-site team. 2011 fellows will participate in either an **ocean sciences expedition** exploring the Bahamian archipelago or a **climate change expedition** exploring the carbon-rich peatlands in the Arctic tundra.

Earthwatch training experiences can be transformative, giving teachers inspirational

heating up a pot of soup or a tub of water? The answer may lie in how you stir it. Should you stir with broad circles? Should you stir only in the middle? Should you stir fast or slow?



Investigating principles of thermal energy and energy transfer can help uncover the processes at work as the soup heats up.

The thermal energy in a container of liquid is the total of all of its moving particles, and the movement of thermal energy is called heat. According to the second law of thermodynamics, heat will always move to a colder object. In the [Mix It Up: Transferring Heat by Convection in a Tank](#) mechanical engineering project, students can explore the transfer of heat and the patterns of convection that can influence the rate of transfer. To expand the investigation, add in the variable of viscosity! How do issues of heating and thermal energy transfer differ between tomato soup and chicken noodle? (Difficulty: 6-7)

## Puff Goes the Legume

*Explore bean rehydration and softening*



A range of winter and vegetarian soups get their flavor and substance from dried beans. Rehydrating these beans often involves soaking them for a period of time before beginning the soup. As the beans soak, they plump up, filling with water. In the [Is the Soup Ready?](#) food science project, students can observe how much liquid dried beans can absorb. *Do some bean varieties hold more liquid than others?* (Difficulty: 2-4)

## Softer with Water or with Molasses?

*What you soak the beans in matters*

The ultimate softness of a cooked bean is related to the type and amount of liquid in which it cooks. Altering the cooking liquid can speed up or slow down the softening process, which might be necessary for a recipe that needs to simmer for hours. In [Tough Beans: Which Cooking Liquids Slow Softening the Most?](#), budding food scientists can explore the ways that agents like molasses and lemon juice alter the softening rate of beans.

and exciting material to take back to the classroom. The deadline for applications is February 4, 2011. For more information, visit the [Northrop Grumman site](#).

**NORTHROP GRUMMAN**

(Science Buddies' [aerodynamics & hydrodynamics](#) Project Ideas are sponsored by the Northrop Grumman Foundation.)

## Blogged: Science Gadgets!

We had a great time last month putting together posts on cool, nifty, edgy, science-focused, and techy kits, tools, and gadgets that would be fun to have and could be used in a variety of science projects. Let us know what cool science toys you got (or still want)!



- [Gifts to Give the Grownups--That You can Put to Good "Scientific" Use!](#)
- [Scientifically Speaking: A Holiday Wish List](#)

## Help Students find the Perfect Project for Them



Our [Topic Selection Wizard](#) can help guide students to science projects that fit their areas of interest *and* meet science fair requirements. Give it a try today!

## Keep in Touch

Adding us to your "like" list at [Facebook](#) is an easy way to find out about new projects, giveaways, and other Science Buddies news. No Facebook? You can also follow us at [Twitter](#) or on our [blog](#).



## Quick Links

- [Science Project Directory](#)
- [Topic Selection Wizard](#)
- [Project Guide](#)
- [Scientific Method](#)
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(Difficulty: 4-6)

(Browse other Science Buddies' [cooking](#)  
[and food science](#) Project Ideas)

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