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An Eye on the Gold

The 2010 Winter Olympics promise to be full of chilling speeds, lutzers, hairpin turns, backside 720s, Lincoln loop 180s, and toe loops. Already know the difference between a *salchow* and an *axel jump* or a *switch corked 720* and a *D spin 720*? Pair up your winter sports tricks vocabulary with some cool sports science for a winning combination. On the [Science Buddies blog](#), we've pulled together science Project Ideas that will help you explore issues of balance, speed, friction, and equipment, which could mean the difference between silver and gold.



An Inside Look at the Golden Gate Star Party

Every year, in a secluded field in northern California (one of the darkest spots in the continental U.S.), hundreds of amateur astronomers and astrophotographers camp out for what's known as the Golden State Star Party. Science Buddies founder and president Ken Hess made the trek and has written [a three-part series](#) on the Science Buddies blog, chronicling his experience watching and photographing two nearby galaxies, M81 and M82.

Focusing on stars 12 million light years away, galaxies 90,000 light years in diameter, and long-exposure photos taken over periods of hours gives new meaning to the word "vast." From measuring the speed of light in gelatin to plotting the center of the Milky Way, Ken's

Get the Party Started!

Difficulty: 6



Food and drinks? *Check*. Friends? *Check*. Music? *Check*. What would take this party to the next level? An *interactive dance pad*! In [Dance Mania: Build Your Own Dance Pad](#), you will use a simple circuit and other readily available materials to make your own dance pad. Learn more about circuits and the flow of electricity as you step on and off the pad, activating a light bulb or buzzer with each step!

Vintage Sound

Difficulty: 4-6

"Vinyl" is mostly a thing of the past, but there *was* recorded music before CD's and mp3's. In [Take a Musical Step Back in Time: Make Your Own Phonograph from Everyday Items](#), you'll set up a simple player to explore which materials create the best sound.

You might not rock the house with your makeshift turntable, but for a crash course in decibels, check out [Extreme Sounds: Lessons in a Noisy World](#).

Staff Scientist's Pick of the Month



[series](#) will get you started exploring astronomy and astrophotography at home.

Do-It-Yourself DNA

With DNA in the limelight of many TV shows, there's a certain mystique to these genetic building blocks. With the right Project Ideas and materials, you can get started extracting, comparing, separating, and exploring DNA at home. In the process, you'll learn about gel electrophoresis, protein ladders, gene expressions, transformations, forensics, and more.

Extracting DNA

- [Do It Yourself DNA](#) (Difficulty: 1-3)
- [Extracting Onion DNA](#) (Difficulty: 5)

Visualizing DNA

- [Forensic Science: Building Your Own Tool for Visualizing DNA](#) (Difficulty: 7-9)
- [Who Done It? DNA Fingerprinting and Forensics](#) (Difficulty: 8-10)

Manipulating DNA

- [Expression Cloning*](#) (Difficulty: 8-10)
- [Bacterial Transformation Efficiency](#) (Difficulty: 8-10)

Many of these Project Ideas employ materials or equipment from the Biotechnology Explorer™ program of Bio-Rad Laboratories, sponsor of the Science Buddies [biotechnology interest area](#).

Warming Up Your Winter



Heating Your Hands with a Supercooled Solution

Difficulty: 7

It's freezing outside, but you are having way too much fun out in the snow to call it a day. One way to warm up fast so you can keep those snowballs coming is to use hand warmers. These plastic pouches, found at your local sporting goods store, contain a clear solution of sodium acetate and a small metal disk. When the disk is pushed, the solution crystallizes, and the pouch warms up.

To find out more about the chemistry behind

According to Science Buddies staff scientist David Whyte, a simple organism isn't always as "simple" as we might think. One of David's latest Project Ideas involves putting *Physarum* (aka "slime mold") in a maze to see how "smart" the slime mold is when it comes to finding a food source.

This fascinating project will leave you thinking about what constitutes "intelligence." You can read David's ["Pick of the Month" write-up](#) on the Science Buddies blog. Or, head straight for the Project Idea: [Smarter Than Your Average Slime: Maze-solving by an Amoeboid Organism](#).

Newly Released Science Fair Project Ideas



Looking for something new?

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

Difficulty: 2-5

- [Spinning Colors: How Do Primary Colors Combine to Make New Colors?](#)
- [Colorful Chemistry Creations: Make Your Own Sun Print with Color and Sunlight!](#)
- [The Pasta Puzzle: How Much Water is Required to Cook Pasta?](#)

Difficulty: 5-7

- [Build a Better Moth Trap: Will Different-colored Lights Affect How Many Moths You Catch?](#)
- [Build Your Own Windmill Generator & Measure its Electrical Current Output](#)
- [Helicopter Liftoff: How Does the Speed of the Rotor Affect the Amount of Lift?](#)
- [How Low Can It Go? Design a Kite that Flies Best in Low Winds](#)
- [Leveraging Light: Build a Laser-Based Device to Weigh Small Masses](#)
- [Rocketology: Baking Soda +](#)

these pocket-sized, single-use heaters, check out [How Do You Get Heat from a Supercooled Solution?](#)

Soup's On!

Difficulty: 2-4

Dried beans have a long shelf life, but soak them in a bit of water, and they're ready for your favorite cold weather soups, chilis, and stews. From kidney beans to lentils, find out more about rehydration and absorption in [Is the Soup Ready? Measure How Much Water is Absorbed by Dried Beans.](#)

For more fun with beans, see [Tough Beans: Which Cooking Liquids Slow Softening the Most?](#)

[Vinegar = Lift Off!](#)

- [Solar-powered Chemistry: Study Chemical Reaction Rates in Ultraviolet Beads](#)
- [Weathering the Windchill: How Does Wind Speed Affect How Quickly an Object Cools?](#)

Difficulty: 7-8

- [Animal Magnetism: Do Large Mammals Align Themselves with Earth's Magnetic Field?](#)
- [Piaget's Theory of Conservation: When One Cup of Water is Less Than One Cup of Water](#)

When Animals Get Cold

People have endless options when it comes to keeping warm in the cold and wind--scarves, hats, gloves, long johns, hand warmers, a fireplace. Animals, however, have fewer ways to keep warm, but that doesn't necessarily mean the ways they *do* have are any less effective. For a look at instinctive animal warming behaviors, check out:

- [Huddle & Cuddle: How Puppies Keep Warm](#) (Difficulty: 5-7)
- [Point Your Ponies: How Horses Keep Warm in the Wind](#) (Difficulty: 2-3)

Looking for a Perfect Project for *You*?



Our [Topic Selection Wizard](#) can help guide you to a science project that fits your areas of interest *and* meets science fair requirements. Give it a try today!

About Science Buddies Project Ideas

Abbreviated Project Ideas

Have you noticed that some of our projects have an asterisk (*) after the title? These projects are "*Abbreviated Project Ideas*" that give you a concept on which you can expand to create your own unique science project. Designed for more independent work, these projects do not contain an experimental procedure.

Difficulty Level

All Science Buddies projects are ranked in terms of "Difficulty Level." *This ranking does not correlate directly with grade level.* Given the differences between schools, statewide curricula, and individual experience and coursework, the noted "Difficulty Level" indicates a range for each project. To see where a project falls in terms of estimated grades, please view our [Understanding Project "Difficulty"](#) chart.

All-Time Favorite Science Project?

What's the coolest science fair project you ever did or had a student do? Stop by the [Science Buddies at Facebook](#) page and let us know! While you're there, mark yourself a "fan." It's an easy way to find out about new projects, giveaways and other Science Buddies' news.



Show Your Science Buddies Support!



The [Science Buddies CafePress store](#) features all kinds of cool logo-wear--from

Sigg™ bottles and hats to t-shirts and more. Shirts in kid-friendly sizes are now available! Stop by and check it out!

Help Spread the Word

If you have a friend, colleague, or family member that you think would enjoy Science Buddies and the Science Buddies newsletters, please forward a copy of this month's Project Roundup.

(If you received a copy of the newsletter from a friend and would like to sign up, please visit: <http://tinyurl.com/ydgjbsq>.)

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