



December 2008

Great Information Jewels You Don't Want To Miss!

Treasures for Teachers TREASURE CHEST NEWSLETTER

Please RECYCLE this newsletter by passing it on to a friend.

What's In This Issue?

Activity of the Month

The Story of H₂O

Upcoming Workshops

- Project Learning Tree
- Project WET
- Project WILD
- Introduction to Internet Resource Materials
- Science Take-Home Bags
- Kid Friendly Report Design
- Family Math or Science Night

What's In Stock?

Free classroom materials

Things To Know About Celestia

The Greens

MESSENGER project workshops

Spider's Prey

Web Site of the Month:

Spacesuits and Spacewalks



Come and see our extensive collection of science and technology curriculum that you can download for FREE!

Activity of the Month



The Story of H₂O

A Whole Group Mime Activity

This month's activities will allow your students to:

- experience H₂O in a dynamic, kinesthetic way
- build a precursor understanding of atoms and molecules.

See the last page of this NEWSLETTER for attached activity.



This is the time of year
that individuals consider
giving to good causes.



Please consider giving to the Space Grant Education and Enterprise Institute. Your tax deductible gift of 20, 50, 100 or more will support their teacher education and student development programs in science, engineering, environment and technology. All it takes is 10 minutes on a secure fund raising web site. Simply

Go to www.guidestar.org

When the "Find Nonprofits" box appears type in the words "Space Grant Education and Enterprise Institute" and click the "Search" button. When the Space Grant site appears simply click the "Donate Now" button. Answer the questions, and add your donation with the "Add to Cart" button. It's as simple as that. Thank you for your consideration!

Upcoming Workshops

End the year with a BANG!

Join us for WORKSHOPS to make the last days of
2008 GREAT!

Come today, use it tomorrow!



The Science & Technology Teacher Resource Center offers FREE science workshops to teachers! Join us for a few hours and add some new ideas to your science repertoire. Workshops are offered at our site or they may be scheduled at a time or place more convenient to you. Call 619-255-2912 to schedule a time or to sign up for a workshop.

We have received a generous grant that makes these workshops possible!

Environmental Education Workshops

These award winning programs provide more than just an introduction to environmental ed. They are balanced programs that **teach how to think, not what to think.** Each program is aligned to the California State Standards and teaches science concepts and skills in fun, collaborative ways.



Look in next month's Newsletter to see when these Workshops will be offered in the New Year.



What do you do with a Tree Cookie? Discover

activities to increase your students' awareness and knowledge of the environment, as well as their place within it.

Attendees will be provided a **FREE 470 page Environmental Education Activity Guide.**



WET stands for Water Education for Teachers. Join us for an introduction to how water impacts our lives.

Attendees of this 6 hour workshop will be provided with a **FREE 500+ page curriculum & activity guide** filled with games and activities to use with their classes.



This 6 hour workshop provides you

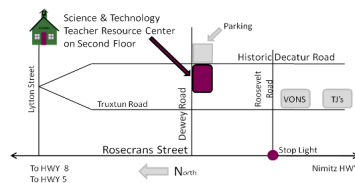
with games and activities to use with your students that introduce them to how animal life fits into the environment.

Attendees will receive a **FREE 500+ page curriculum & activity guide.**

This workshop will be held at the Resource Center from 9am-3pm on Dec 6, 2008.

Science & Technology Teacher Resource Center

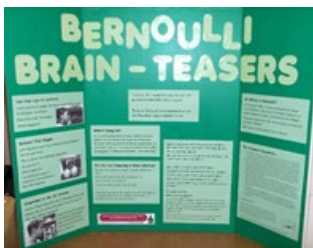
Located at NTC Promenade (former Naval Training Center) in Point Loma, just off Rosecrans Street
2825 Dewey Road # 205
San Diego, California 92106



CALL 619-255-2912 for an appointment to view the Center.

We can be reached at: sfreeburn@csgf.org

More Workshops!



Family Math or Science Night

Create excitement and get parents involved with your school. Attend this workshop to find out **HOW** to organize this event at your school. We will discuss **WHAT** to include and **WHERE** to get ideas to make the event a success.

This 2 hour workshop will be held at the Resource Center from 6-8 pm on Dec 2, 2008.



Science Take-Home Bags

What can you do with a convention bag? Attend this workshop and find out!! We will provide the bags and ideas. You will provide some imagination!! This 2 hour workshop will be held at the Resource Center in the New Year!



Introduction to Internet Resource Materials

The internet is loaded with **FREE** supplementary science materials. Find out where they are located in this hands-on workshop.

This 3 hour workshop will be held at the Resource Center in the New Year!

Kid-Friendly Report Design

Looking for a more interesting way for your students to present science reports? This workshop will introduce you to a fun, kid-friendly report design.

This 3 hour workshop will be held at the Resource Center from 6 -9 pm on Dec 16, 2008.

Drop by to discover all of the wonderful **FREE** treasures available to take back to your classroom!



What's In Stock?

We have **tote bags** from conventions that were held in San Diego. Tote bags are a wonderful way to store science units. Drop by and pick some up to help organize your science materials.

Science is FUN

TEACHER: "Donald, what is the chemical formula for water?"

DONALD: "H I J K L M N O."

TEACHER: "What are you talking about?"

DONALD: "Yesterday you said it's H to O."

TEACHER: "Gary, do you know what copper nitrate is?"

GARY: "Yes sir, it's what they pay policemen on nightshift!"

TEACHER: Well, at least there's one thing I can say about your son.

FATHER: What's that?

TEACHER: With grades like these, he couldn't be cheating.

"Success is a lousy teacher. It seduces smart people into thinking they can't lose."

*--Bill Gates,
Microsoft co-founder,
philanthropist*

Things To Know About!

Science programs you don't want to miss.

www.shatters.net/celestia/

This Virtual astronomy software will spark your student interest in science.

Celestia is a free software program that will allow your students to traverse time and space. The software transforms a classroom into a three-dimensional virtual universe.



NEW WGBH RESOURCE FOR 9-12 YEAR-OLDS

THE GREENS, a PBS Web site that encourages kids to explore sustainability and take action wherever they can, is offering **FREE Activity Guides to educators** working with 9 to 12 year-olds. The Guide pairs hands-on activities to deepen kids' understanding of topics like recycling and global warming with campaigns to reduce junk mail and get drivers to stop idling cars. Activities can be conducted

over separate one-hour sessions. Download the activities at

<http://meetthegreens.pbskids.org/features/>

Would you like to learn how to make a scale model of the Solar System? Or learn how to demonstrate how craters are made? Or even share with your students how the sun emits UV light and what simple things will protect them from the UV light? This month's science activity is just one of the wonderful learning experiences from NASA's MESSENGER project that you can share with your students. As a MESSENGER Educator Fellow Sharon would be delighted to share the materials with you and/or the teachers in your faculty in a FREE workshop. Call 619-847-5518 to find out more!

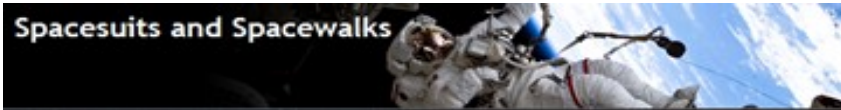


Spider's Prey

Web Sites of the Month

The **NASA Education Spacesuits and Spacewalks Web site** brings a wealth of educational resources together in one place.

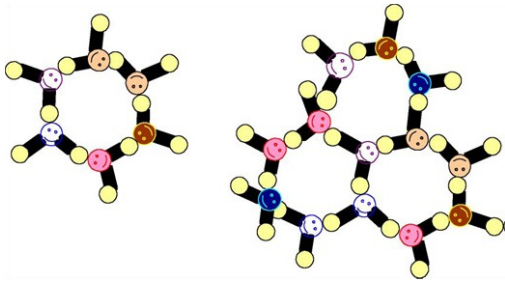
www.nasa.gov/education/spacesuits



With the upcoming space shuttle missions continuing construction on the International Space Station and to provide maintenance to the Hubble Space Telescope, the importance of spacewalks and the reliance on spacesuits are taking center stage. To help educators share these topics with their students, NASA Education has unveiled a new Web site.

Visitors to the Web site can:

- Check out the Clickable Spacesuit and learn about the different parts of a spacesuit.
- Take a look at videos about the spacesuits of the future.
- Watch Brain Bites videos and learn about hard-to-do moves in a spacesuit.
- Take a step back in time and visit the Spacesuit History Gallery.
- Explore the Educational Activities.
- Read about spacesuit designers and engineers who create and test spacesuits.
- Discover other NASA Web sites with information about spacesuits and spacewalks.



ACT OUT THE SCIENCE

*A Whole Group Mime Activity:
Movement Integration Mediating Experience*

The Story of H₂O

from *Exploring Ice in the Solar System*

Contact Sharon at Sfreeburn@sgeei.org for more activities in this wonderful NASA program.

This activity illustrates H₂O in a dynamic, kinesthetic way, comparable to a graphic illustration. This sequence builds a precursor understanding of atoms and molecules.

You've probably heard that water and ice are made of H₂O. What does this really mean? Let's explore this *immediately*. Everyone stand up. Let's see if we can figure this out together. (Have everyone stand up in an open area. Make sure everyone has plenty of room to move without bumping into anyone or anything. We are going to use the hands and then the whole body to create an experiential model of H₂O.)

First, put up your hands, shake them out. Roll your hands into a fist, and then unroll. Good. Okay, now we are going to make models of molecules of water — out of ourselves! So, what is H₂O? First, let's explore what the H means: hydrogen. What's hydrogen? It's a tiny atom with a proton and an electron. Hydrogen is what stars are made of. And it's mostly what we are made of. Hydrogen is in a lot of the foods we eat: have you ever heard of proteins and carbohydrates? Got hydrogen? When we eat proteins and carbohydrates and when we drink water, we're *hydrogenating* ourselves!

So let's start making a model of Hydrogen. Let one hand roll into a fist. We'll call this fist a powerfully positive proton. It is the center, or the *nucleus*, of an atom of hydrogen. (Have everyone form one fist, in the air, to show a proton.)

Now, let the other hand, with its fingers opening and closing and zipping around, sometimes in close to your powerfully positive proton, sometimes jumping about. This represents an energetic electron cloud. (One hand remains playing the part of the powerfully positive proton, as the other hand moves around as the energetic (and negatively charged) electron cloud.) If you could move your hand as fast as an electron, it would seem to be everywhere all at once as far as it could reach.

If a proton were really as big as your fist, your arm would have to be 100 to 200 yards long. We'd have to reach from here to ... select a familiar spot to make this point... and move so fast as to be everywhere in every direction filling up that space. (Let everyone stretch their arms, imagining that they are getting longer and longer. Scale: if you were standing on the pitcher's mound, reach to the outer bleachers and race around in all directions to fill up the volume of space defined by the electron cloud.)

Together, your powerfully positive proton and your energetic electron cloud make up an atom of Hydrogen. When two of them join up with an oxygen atom, it makes H₂O. Got water? (Together, the fist and the rapidly moving open hand, represent an H atom — with proton nucleus and electron cloud.)

Let's make a new model to fit this all together: imagine now, that your head is an atom of oxygen, O, and each of your hands, a hydrogen atom ready to connect, forming a covalent bond, which you can show as your arms. Hey, they're already connected! (Take a moment to shift the scene from the two hands showing the H atomic structure to the H₂O: the head is now the O atom; the two fists are the two H atoms. The arms represent the covalent bond that holds the H close to the O.)

Oxygen attracts two H atoms to make a triangular shape. Stretch your arms as if you were about to give a bear hug (~104°). Notice that it's a little wider than if we were making the shape of the corner of a square(90°). (The two arms become the two H atoms that seek to join the O. This forms a covalent bond, a sharing of electron cloud space.)

Now each of us is a water molecule. H- shake your fist — 2- shake both your fist s— O- bob your head. Hey, look, we're *bobbled water!*

At room temperature, we all just slosh and bobble around as liquid water, but if it gets colder... down close to within 4°C of freezing, we start moving closer together, more densely packed — but just as we reach freezing, we water molecules expand and connect! (These connections are *hydrogen bonds*. This also anticipates understanding why ice floats The difference between 104° and 109° is very slight, yet the distinction is critical because it helps explain structurally why ice is less dense than water.)

Slightly widen your bear hug angle to ~109° and you'll notice that we just fit six of us to form a ring, hand to shoulder — this shape is a six sided hexagon, and we are now frozen ice crystals! (The precise difference between 104° and 109° angle is not so important. But it is important to understand that the slightly larger bear hug makes a difference — between water and ice.)



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