



HOWTOSMILE.ORG

Designs & Strategies

Sherry Hsi

NSDL Annual Meeting 2010

November 3, 2010

Overview

1. Vision - Howtosmile.org
2. Demo
3. User testing and evaluation
4. The Collection and Metadata
5. Seed grants & SMILE Champions
6. Future work



HOWTOSMILE.ORG
ALL THE BEST SCIENCE & MATH ACTIVITIES

MISSION & GOALS

- *Make it easy for out-of-school educators to **discover** high-quality STEM learning resources and use them with a **diversity of audiences***
- *Create a **metadata profile** that captures the value-added information unique to informal educators*
- *Build a **sustainable partnership** among informal science institutions to contribute, share, and use activities*





DINO JUNGLES RETURN
Back to Main Menu

PLAY YOUR VOLT DINOJUNGLES DETECTIVES EXPERIMENTS GAMES

Dinosaur Bone Experiment #1 STEP 1 2 3 4

Put the two bones in a jar of water.

Soak the bones for up to 30 minutes or any remaining meat falls off.

Then remove the bones.

30 min

Main Menu

- "Dinosaur" Bone Experiments Site
- Experiment #1
- When You Get Done
- Experiment #2
- When You Get Done

Print Version (PDF)

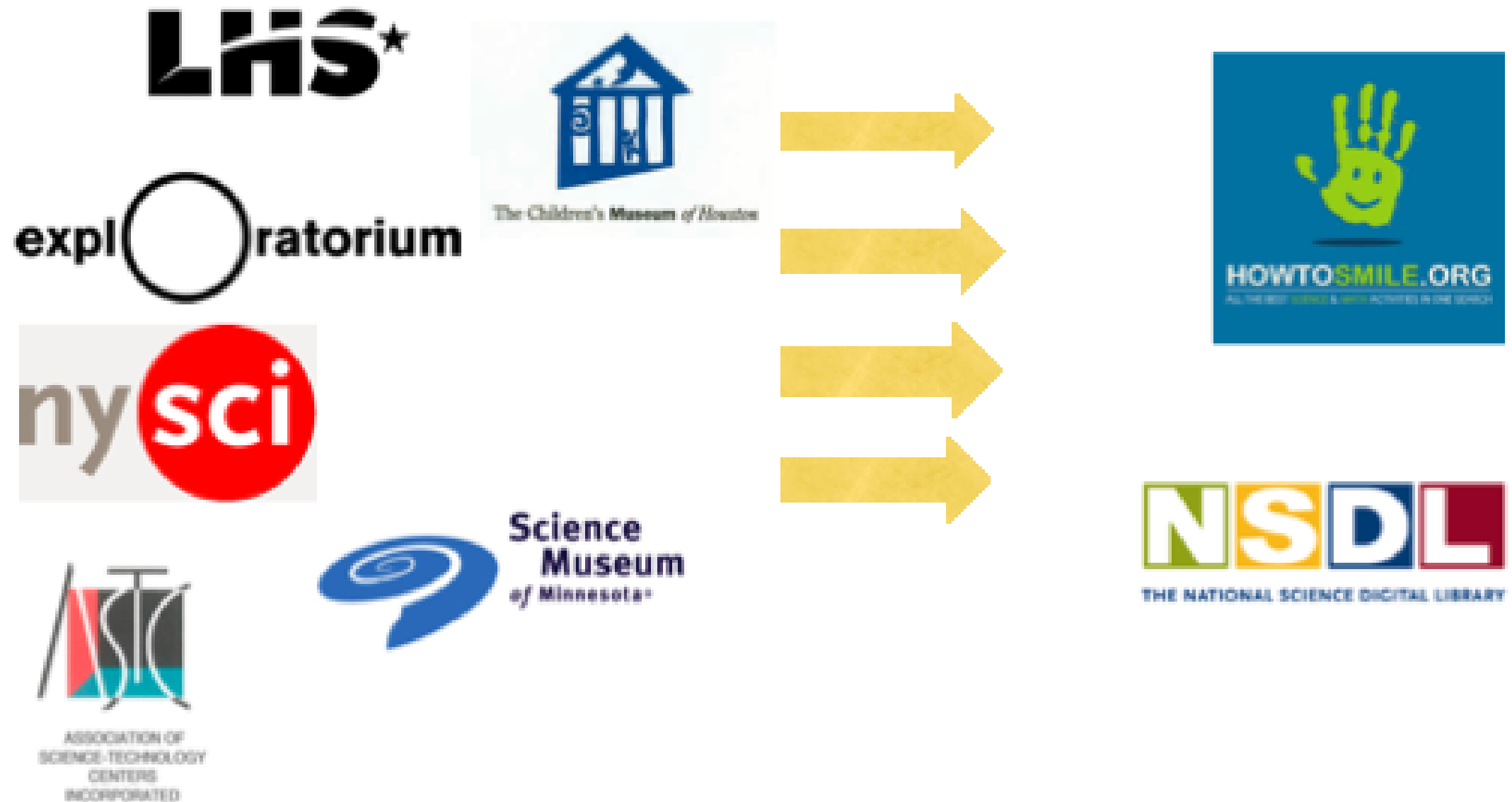
Back

HOW TO

SIZE WHEEL INSTRUCTIONS

- Open the Size Wheel page. Open the Wheel Cover page. Open the Stick page. PEEK at these pages.
- Cut out the Size Wheel along the outside circle.
- Use a paper fastener (staple) to make a hole through the center of the wheel.
- Prepare the Cover to Size Wheel without wheel.
- Join Wheel and Cover using fastener.
- Cut out the sticks along the dotted lines.
- Apply the appropriate sticks to the squares.

HOWTOSMILE.ORG ***(Science and Math Informal Learning Educators = SMILE Pathway)***



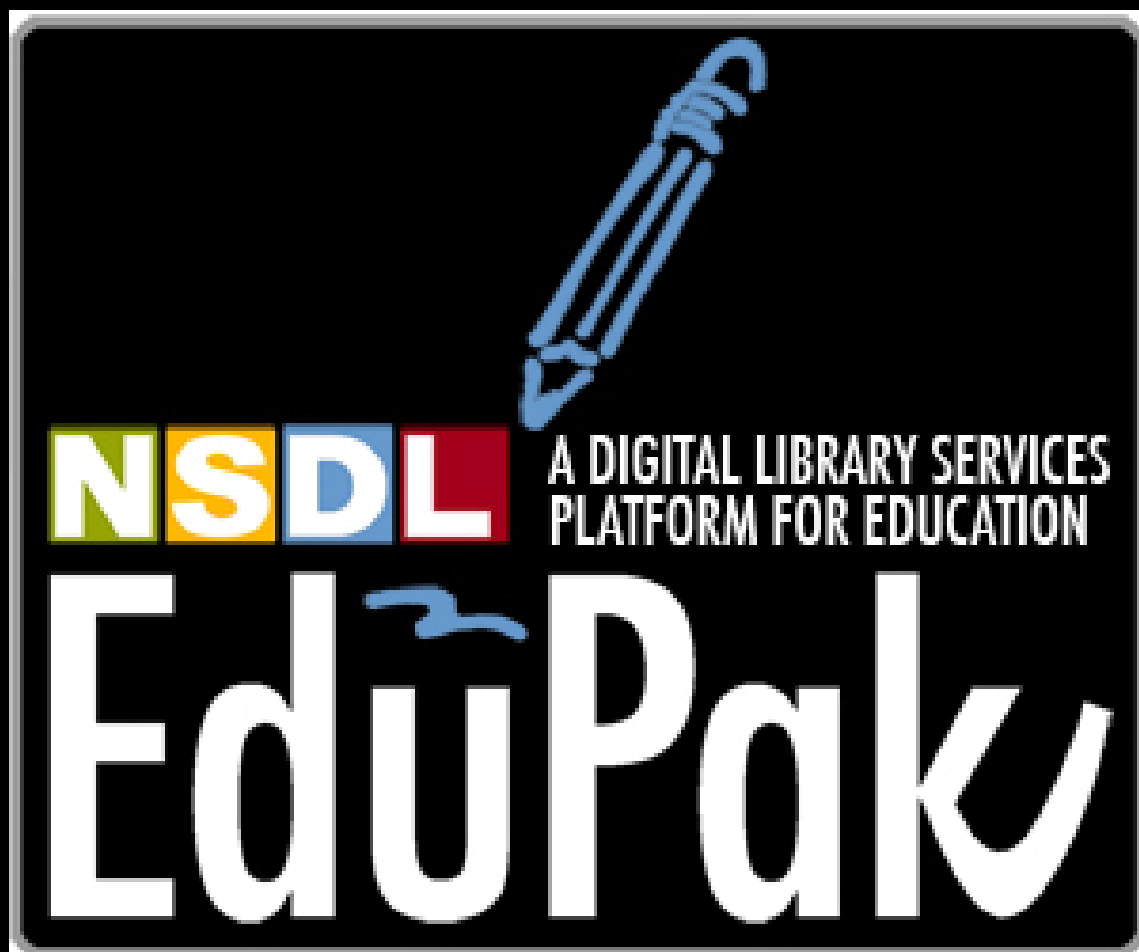
SEED GRANTS & SMILE CHAMPIONS

- AAUW
- Astronomical Society of the Pacific
- Assoc. of Zoos & Aquariums (AZA)
- The Bridge
- Coalition for Science Afterschool
- COSI Columbus
- DragonFly TV (TPT)
- 4H Council
- NASA
- NISE Network
- OMSI
- Perkins School for the Blind
- SACNAS
- Smithsonian National Air & Space Museum
- TERC
- WNET



Technology Behind

howtosmile.org



NSDL Cataloging System:

Interactive collection
metadata management
system

NSDL Data Repository:

Open source Fedora-based
digital object repository
software



Data Discovery System:

Search application with
flexible configuration
capabilities



Metadata Editor

smile009 → (s009test-000-000-000-035)

Activity Basics

Authorship, Rights

Cost, Time, Materials

Diversity

Place and Time

Save record

Validate page



Exit

Edit

View record

ActivityBasics NOTES:

- Items in red are required, and items in black are optional.
- Read the [introduction to the Guidelines](#) if you're new here.
- See a [preview of this record on the user website](#)

recordID

s009test-000-000-000-035

url

Enter the **URL** for the page that will be most useful to an educator for this resource.

[best practices](#)

title

Enter the resource **title** (required), and if there is a *subtitle*, enter it separately.

[best practices](#)

subtitle

relatedUrls

[add relatedUrl](#)

Enter **relatedURLs** for components of the resource ("Has part"), and higher level pages ("Is part of").

[best practices](#)

For standards or assessments, enter the URLs in the separate fields below, *standardsUrl* and *assessmentUrl*.

description

Enter a brief (50-125 words) but comprehensive **description** of the resource. Consider using this format:

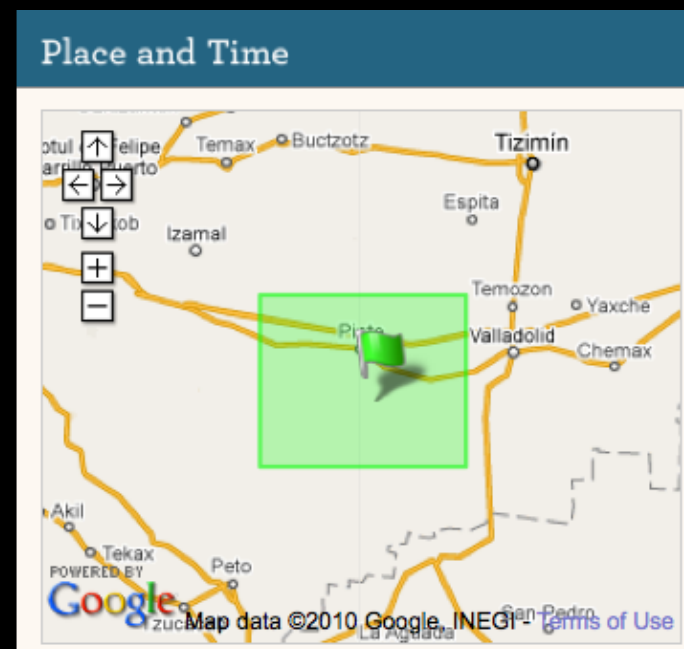
[best practices](#)

- This is an (activity, game, etc.) about (concept, topic, etc.).
- Learners will (do stuff).
- Ideas for use include (ideas).
- Other important, useful, cool information is (examples).

Word count: 0

SMILE Metadata

- Materials, Cost
- Diversity
- Informal categories
- Place and Time
- NSF project #



Animals
Arts and Crafts
Backyard
Science
Collecting
Computers
Electronics
Food and
Cooking
Games
Gardening
Historical
Reenactment
Literature
Model Building
Music
Outdoor and
Nature
Performing Arts
Photography and
Film/Video
Sports and
Exercise
Toys
Transportation

<http://howtosmile.org/feedback/>

DEMO

howtosmile.org

Home Page



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Search 1013 Science & Math Activities

FIND THE BEST
SCIENCE & MATH
ACTIVITIES

It's free! Set up your account and start exploring today!

SIGN UP for FREE

Featured Activity: **Sticky Situations** [Go to Activity](#)

Activities

Recently Added | Most Popular | Most Popular Today | Highest Rated



Pollen Tracks



A Model Nuclear Power Plant Steam

1

Lists

Recently Added | Most Popular



Chemistry
by rstalbans on 10/11/10



Biology
by rstalbans on 10/11/10

Comments

Recently Added | Most Popular



What a great idea
by megan.ennes on 10/7/10



Heart action activity
by poreilly on 10/6/10

Search results



candy

Search

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[Log Out](#)

sherryhsi's Stuff



[View Public Page](#)

[View Lists](#)

[My Settings: Edit Public Page Info](#)

Your Filters:

Your Filters:

[clear all](#)

Search Term: candy

Narrow Results By:

▼ Age Range

- 4-6 years old (PreK-K) (2)
- 6-8 years old (grades 1-2) (5)
- 8-11 years old (grades 3-5) (8)
- 11-14 years old (grades 6-8) (7)
- 14-18 years old (grades 9-12) (5)
- 18 years and older (adult) (1)



Results Showing 1-10 of 10 records:

Sort by: [Relevance](#)



Starburst® Graph

★★★★★

In this activity, children use Starburst® candy to sort, classify, compare, and graph. Grab a handful of one-inch candy squares, sort them by color, graph your candy, and discuss ...

[ADD TO LIST](#)



\$ \$5 - \$10 per group

📅 Ages 4 - 11

🕒 5 to 10 minutes

[SMILE DETAILS](#)



Candy Dish Natural Selection

★★★★★

In this yummy biology activity (page 3 of the PDF), learners participate in a demonstration of natural selection. By using a bowl of candy as a "population," students discover how ...

[ADD TO LIST](#)



\$ \$5 - \$10 per group

📅 Ages 11 - 18

🕒 10 to 30 minutes

[SMILE DETAILS](#)



Color Sudoku

★★★★★

The popular sudoku puzzles use number, but it could be any set of 9 different objects! In this activity (on pages 56-75 of PDF), students use objects of different colors to solve ...



\$ 1 cent - \$1 per student

📅 Ages 8 - 14

🕒 45 to 60 minutes

Faceted Search

Narrow Results By:

▼ Age Range

- 4-6 years old (PreK-K) (2)
- 6-8 years old (grades 1-2) (5)
- 8-11 years old (grades 3-5) (8)
- 11-14 years old (grades 6-8) (7)
- 14-18 years old (grades 9-12) (5)
- 18 years and older (adult) (1)

▼ Subject

- Earth and Space Science (1)
- Engineering and Technology (1)
- Life Sciences (4)
- Mathematics (3)
- Physical Sciences (4)

> Resource Type

▼ Material Costs

- 1 cent - \$1 (2)
- \$1 - \$5 (5)
- \$5 - \$10 (3)

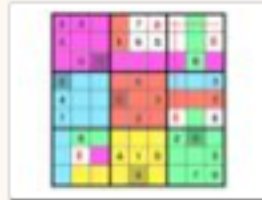
▼ Learning Time

- 5 to 10 minutes (2)
- 10 to 30 minutes (4)
- 30 to 45 minutes (2)
- 45 to 60 minutes (1)
- 1 to 7 days (1)

▼ Source Institution

- COSI (3)
- Children's Museum Of Houston (1)
- Lawrence Hall of Science (1)
- Oregon Museum of Science and Industry (1)
- Perkins School for the Blind (1)
- The Exploratorium (2)

ADD TO LIST



Color Sudoku

★★★★★

The popular sudoku puzzles use number, but it could be any set of 9 different objects! In this activity (on pages 56-75 of PDF), students use objects of different colors to solve ...

ADD TO LIST

SMILE DETAILS

OMSI

- \$ 1 cent - \$1 per student
- 📖 Ages 8 - 14
- 🕒 45 to 60 minutes

SMILE DETAILS



Beach Buckets

★★★★★

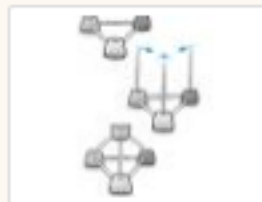
In this activity, learners explore a bucket of sand and beach objects. First they sort items using observable characteristics, then they turn hard candy into "candy sand" to model ...

ADD TO LIST

LHS LAWRENCE HALL OF SCIENCE

- \$ \$1 - \$5 per group
- 📖 Ages 4 - adult
- 🕒 10 to 30 minutes

SMILE DETAILS



Geodesic Gumdrops: Candy and Toothpick Architecture

★★★★★

This hands-on activity shows you how to build basic architectural shapes out of toothpicks and gumdrops. Students learn how different shapes are more stable than others, and are ...

ADD TO LIST

exploratorium

- \$ \$1 - \$5 per student
- 📖 Ages 6 - 11
- 🕒 30 to 45 minutes

SMILE DETAILS



Soda Explosion

★★★★★

This hands-on activity lets participant explore chemical reactions as they create a soda explosion with lots of bubbles. The bubbles in soda are made of carbon dioxide gas. Using ...

ADD TO LIST

- \$ \$1 - \$5 per student
- 📖 Ages 6 - 11
- 🕒 5 to 10 minutes

SMILE DETAILS

Record Page



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sherryhsi's Stuff



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[View Lists](#)

[My Settings: Edit Public Page Info](#)

User Lists

This activity is part of these lists



candy, cookie, and ice cream science
by erinvr



Single Serving Buffet
by KenBell

Related Videos

There are no videos for the resource. Be the first to add a video.

[+ Add your own Video](#)

Starburst Graph

[View](#)

[Edit](#)

[Track](#)

[ADD TO LIST](#)

[GO TO ACTIVITY](#)

★★★★★ [Add a Comment](#)

Description

In this activity, children use Starburst® candy to sort, classify, compare, and graph. Grab a handful of one-inch candy squares, sort them by color, graph your candy, and discuss the results. The bilingual instruction guide is written in parent/educator friendly language with simple instructions and questions to ask the child. It is one of six in the Para Los Ninos Math at Home activity packet.

Quick Guide

Preparation Time:	Under 5 minutes
Activity Time:	5 to 10 minutes
Estimated materials cost:	\$5 - \$10 per group of students
Age Range:	Ages 4 - 11
Resource Types:	Activity Lesson/Lesson Plan
Language:	English, Spanish

Materials List (per group of students)

- Starburst® candies
- Crayons the same color as the candy
- 1" graph

Source Institution



Keywords

[graph](#) [analyze](#) [compare](#) [sort](#)
[classify](#) [candy](#) [square](#) [grid](#)
[propability](#) [data](#) [bar graph](#)
[Starburst®](#)

Community & Personalization

- User Profiles
- Comments & Lists
- Videos
- Badges
- SMILE Blog
- SMILE Widget

PROFILE PAGE



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sherryhsi's Stuff

[View Public Page](#)[View Lists](#)

My Settings: [Edit Public Page Info](#)

My Dashboard

Points: **50**

Total Badges:



User Badges

Student

Teacher

sherryhsi's Public Page



Name: Sherry Hsi
City: Berkeley
Workplace: Lawrence Hall of Science
Decade born: 1960s
Work with ages: 3 to Adult

Bio
I create and evaluate formal and informal learning experiences that usually involve science, inquiry, design, learning technologies, new media, and networks. I can be easily bribed with chocolate.

[My Public Page](#)[My Lists](#)

My Settings:

[Edit Account Info](#)[Edit Public Page Info](#)

sherryhsi's Lists



Music Making Activities

Make and take activities about sound. Play all the the instruments together to make...

[Public List](#) | [View List](#) | 5

[View All Lists](#)

sherryhsi's Comments

posted on Jul 28, 2010

Here are two places where you find bones for the Marine Skulls Cart activity: Skull Sun Limited and...

0

posted on Jul 20, 2010

This is one of my favorite activities. I saw Ken Finn do this in a homeschool class at the Exploratorium. He

0

USER-CREATED LISTS



HOWTOSMILE.ORG
ALL THE BEST SCIENCE & MATH ACTIVITIES

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sherryhsi's Stuff

[View Public Page](#)[View Lists](#)

My Settings: [Edit Public Page Info](#)

Music Making Activities

[Favorite](#)

Make and take activities about sound. Play all the the instruments together to make the sound of a rainforest.

[+ Link](#)[Private](#)[Public](#)

Cuica (Laughing Cup)

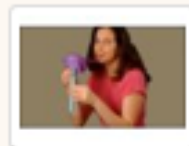
These are great noise makers. Use recycled tin cans or yogurt containers if you want to save money.

[SMILE DETAILS](#)

Sound Sandwich

[SMILE DETAILS](#)

Make Pan Pipes

[SMILE DETAILS](#)

Waterbottle Membranophone

Works well when they are water bottles rather than ones with soda or ice tea that are sticky on the inside and need to be thoroughly washed before used.

[SMILE DETAILS](#)[EDIT](#)













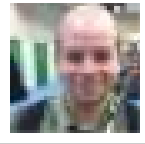



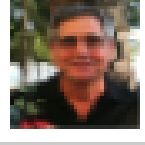



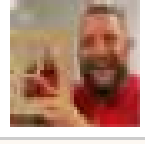



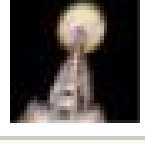



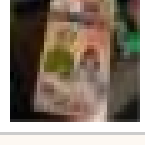



Place Matters


This is a great activity.

[SMILE DETAILS](#)[ShareThis](#)

BADGES & POINTS

Enthusiast
Fanatic
Yearling
Student
Nice comment
Good comment
Great comment
Commentator
Pundit
Aggregator
Mortarboard
Epic...

★ Leaders	
Most Points	Most Badges
 dblue 7 badges	 0  0  7
 jrose 6 badges	 0  0  6
 sherryhsi 5 badges	 0  0  5
 alopez 4 badges	 0  0  4
 KenBell 4 badges	 0  0  4
 darrell 4 badges	 0  0  4
 smileadmin 4 badges	 0  0  4
 namedina 3 badges	 0  0  3



Win an iPad!

To celebrate the launch of the new howtosmile.org site for science and math activities, we are giving away a 16GB Wi-Fi Apple iPad to one lucky howtosmile.org user.

Participate in the howtosmile.org community by earning at least ONE badge between October 1 and December 31, 2010.

USER-CONTRIBUTED VIDEOS

sherryhsi's Stuff



[View Public Page](#)

[View Lists](#)

My Settings: [Edit Public Page Info](#)

User Lists

This activity is part of these lists



[Single Serving Buffet](#)
by KenBell



[ASTC 2010 Workshop Activities](#)
by You

Related Videos

These videos are about this activity



[Ocean in a Bottle Demonstration](#)
uploaded by darrell
0:43

[+ Add your own Video](#)

Ocean in a Bottle

[View](#)

[Edit](#)

[Track](#)

[ADD TO LIST](#)

[GO TO ACTIVITY](#)

★★★★★ [Add a Comment](#)

Description

In this simulation activity, learners observe waves churn up water and oil from an oil spill with water, blue coloring and hair conditioner then rock the bottle to create movement of ocean waves.

Quick Guide

Preparation Time:

Activity Time:

Estimated materials cost:

Age Range:

Resource Types:

Language:

English

Materials List (per group of students)

- Large, clear plastic bottle with a tight-fitting lid
- Funnel
- Measuring cup

Keywords

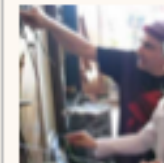
Videos

[Recently Added](#)

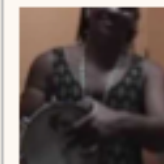
[Most Viewed](#)



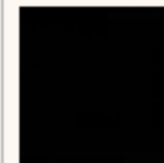
[Water Pressure Blaster walk through](#)
uploaded by smileadmin
for Water Pressure Blaster
38



[Sylvia's Super-Awesome Show making a sound](#)
uploaded by smileadmin
for Sound Sandwich
28



[How to play cuica](#)
uploaded by dblue
for Cuica (Laughing Cup):
Make a Musical Instrument
22



[Magnus Glider @ SMM](#)
uploaded by KenBell
for Make Your Own Magnus
Glider
19


EMBEDDED VIDEOS

The image shows a screenshot of the HowToSmile.org website. At the top left is the logo, a hand with a smile, and the text "HOWTOSMILE.ORG ALL THE BEST SCIENCE & MATH ACTIVITIES". To the right is a search bar with the text "Search" and a magnifying glass icon. Below the logo are navigation links: "Home", "About", and "Participate". On the right side, there are links for "Advanced Search", "My Stuff", and "Log Out".

The main content area features a user profile for "sherryhsi's Stuff" with a profile picture and links for "View Public Page" and "View Lists". Below this is a "My Settings: Edit Public Page Info" link. A "User Lists" section follows, stating "This activity is part of these lists" and listing several categories: "Water activities by ifsiyouth", "Summertime activities by keithbraafladt", "Grand Marais Workshop by keithbraafladt", and "3rd Grade Science".

The central focus is a video player window titled "Video" with a close button (X). The video is titled "Water Pressure Blaster walk through" and has a description: "In this experiment, apply pressure to a water bottle to determine how the area of a hole affects the force of the water (which will be observed by measuring the distance the water sprays)." The video player shows a scene with several children outdoors at a table, engaged in an activity. The YouTube logo is visible in the bottom right corner of the video player. The video player controls at the bottom show a play button, a progress bar at 0:00 / 0:00, and other standard video controls.

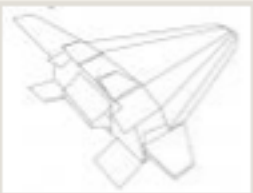
Below the video player, there are fields for "Source Institution", "Estimated materials cost:" (with a dollar sign icon), and a duration field showing "5 to 10 minutes" and "45 to 60 minutes". At the bottom right, there is a field for "\$1 - \$5 per group of students".

 **HOWTOSMILE.ORG**

Showing 1-5 of 169 records


^

Proportionality

 ★★★★★
MORE INFO

In this activity, students build a 1:140 "scale model" of NASA's X-33 Reusable Launch Vehicle (RLV) Technology...

Aerogel-10

 ★★★★★
MORE INFO

This demonstration (on pages 9-11) uses gelatin and lead pellets to model how aerogel, a technology used by NASA

▼

page 1/34 >>

SMILE Widget

<http://howtosmile.org/widget/>

Usability Methods

Design Charettes
Facilitated Brainstorming
Personas
Use Cases

Heuristic Evaluation
Cognitive Walkthrough
Contextual Inquiry
Quality Assurance Testing

PLANNING

TESTING

User Testing

1. Find **representative users**
2. Ask the users to perform **representative tasks** with the design.
3. Observe what the users do, where they succeed, and where they have difficulties with the user interface.

Charette



What kind of features
and functions would
[Persona] want to
have?

Example of Personas

http://howtosmile.org/wiki/index.php/SMILE_Use_Cases

Jada - Science Museum Educator (high web, high sci)

Kalil - After School Science Educator (med web, med sci)

Luanne - Homeschool Mom (low web, low science)

Marcos - Math For Language Practice (med web, high sci)

Najah - Saturday Science Club for the Blind (high web, med sci)

Oliver - Limited Mobility Scientists (med web, high sci)

Peta - Museum Web Developer (high web, med sci)

Quon - Cataloger (med web, med sci)

Jada

Uses SMILE for: finding new ideas for informal science and math activities and supporting materials, as well as finding new ways to do things she already does. She is interested in becoming a regular contributor to SMILE, adding comments, recommending resources and supporting materials, and making links between resources.

Demographic Traits & Psychographic Traits

Age: 30s ; Ethnic Identity: African American

Languages: English

Lives: Urban city that has a science center

Education: B.S. in physics

Interests: Teaching science in fun and engaging ways outside a formal classroom

Hobbies: Video games, downloading digital content - esp. movies and music.

Basic Usability Testing

1. Look and Feel
2. Navigation
 - Ease of use
 - Labels
3. Functionality

Look and Feel

On a scale of one to five how would you rate the look and feel of the page?
One is poor; five is excellent

1. How would you describe the layout?

- a. Open
- b. Intuitive
- c. Clean
- d. Crowded
- e. Cluttered
- f. Other _____

2. How would you describe the design?

- a. Ugly
- b. Neutral
- c. Beautiful

i. What would you change about the design?

Comment:

3. What is your first impression of the colors?

- a. Dislike
- b. Neutral
- c. Like

i. What colors would you prefer?

Comment:

Functionality

Purpose - How easily can a person use the features or services of the site?
Can a person execute all of the search use cases - search, retrieve, and download; refine.

Search

1. Show me how you would search for TERM
 - a. Immediately completes search (3 seconds or less)
 - b. Eventually completes search (3 to 10 seconds)
 - c. Cannot complete search (10 seconds or more)
2. How relevant are your search results? (How closely do search results match the term you searched for?)
 - a. Very close match (Very accurate)
 - b. Close match (Accurate)
 - c. Not close match (Not accurate)
3. How would you refine your search?
 - a. Immediately clicks Advanced Search (3 seconds or less)
 - b. Eventually clicks Advanced Search (3 to 10 seconds)
 - c. Cannot click Advanced Search (10 seconds or more)
4. Show me how you would refine your search?
 - a. Immediately configures Advanced Search (10 seconds or less)

Navigation

Ease of use - How easy is this site to use? (On a scale of one to five.)

One is difficult; five is very easy

1. Where are you?
 - a. Immediately oriented (3 seconds or less)

Hit the page – know where you are
 - b. Partially oriented (3 to 8 seconds)

Hit the page – look around, make a choice
 - c. Disoriented (8 seconds or more)

Hit the page – confused; hard to make a decision.
2. Where can you go?
 - a. Immediately describes places to go (3 seconds or less)
 - b. Eventually describes places to go (3 to 10 seconds)
 - c. Cannot describe places to go (10 seconds or more)
3. What would make the navigation (site) easier to use?
 - a. Link position
 - b. Menu layout
 - c. Menu choices
 - d. Types of icons or symbols
 - e. Icon position

Comments:

Cognitive Walkthrough

Add to List Interface

Page Discussion Edit History

Click button to add result to list

Search Result Title

Per possim legunt delenit option est. Sequitur quam qui legere imperdiet formas. Mazim nam ipsum exerci illum videntur. Litterarum id mutationem legere formas quinta. Dolor suscipit legere litterarum dolore augue. Parum volutpat legentis feugiat me lobortis. Go to source.

View SMILE Record Add to Collection **Add to list**

ADD TO LIST

Choose one of your list from below...

List A

List B

List C

-OR- Make a new list

New List **ADD LIST**

Once you click on "Add to list" a modal window will appear with the options available for adding your list. If you have already the selected item to your list then the modal window will be a simple text line explaining that you that

- Experts “walk” through a set of typical tasks
- Do users do the right things intended by the designer?
- If not, why?

Version 1



SMILE PATHWAY
SCIENCE AND MATH INFORMAL LEARNING EDUCATORS

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Material Costs

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Sound Sandwich

In this activity, construct a noisemaker called a Sound Sandwich using a straw, two craft sticks, and some rubber bands. When you blow into the Sound Sandwich, you make large rubber bands vibrate, and that vibration produces the sound. The straws can be adjusted to change the pitch of the sound. The resource includes instructional videos, a printable instruction sheet, and ideas for going further, as well as

links to other resources with more background science.

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Breaking the Mayan Code: Mayan Math

In this activity, you will decipher a page from the Dresden Codex, one of the few Mayan books still in existence. By thinking like an archaeologist, you'll combine your mathematical abilities with some basic logic and trial-and-error investigation to figure out what the codex means. In the course of your explorations, you'll discover: How archaeologists have figured out what Mayan documents mean; How

the Mayan system of counting is like ours; How it is different, How Mayan beliefs were tied to their understanding of mathematics

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Animal Attraction

Do you have animal attraction? You can right in your own back yard with some craft supplies, your imagination and a little help from Mother Nature. Investigate a flower's power of marketing by making an imitation flower that successfully signals a bee (or other pollinator of your choice) to visit. Try to determine what characteristics will attract a pollinator to your flower.

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Water Bottle Membranophone

In this activity, you'll use a straw, a vinyl glove, a water bottle and a paper tube to make an instrument called a Water Bottle Membranophone that sounds very much like a saxophone. Membranophones are instruments that produces sounds from a vibrating stretched membrane, such as kazoos or drums. You can make several variations with holes in different places, tighter or looser balloon membranes, and

water bottles of different sizes. The resource includes instructional videos, a printable instruction sheet, and ideas for going further, as well as links to other resources with more background science.

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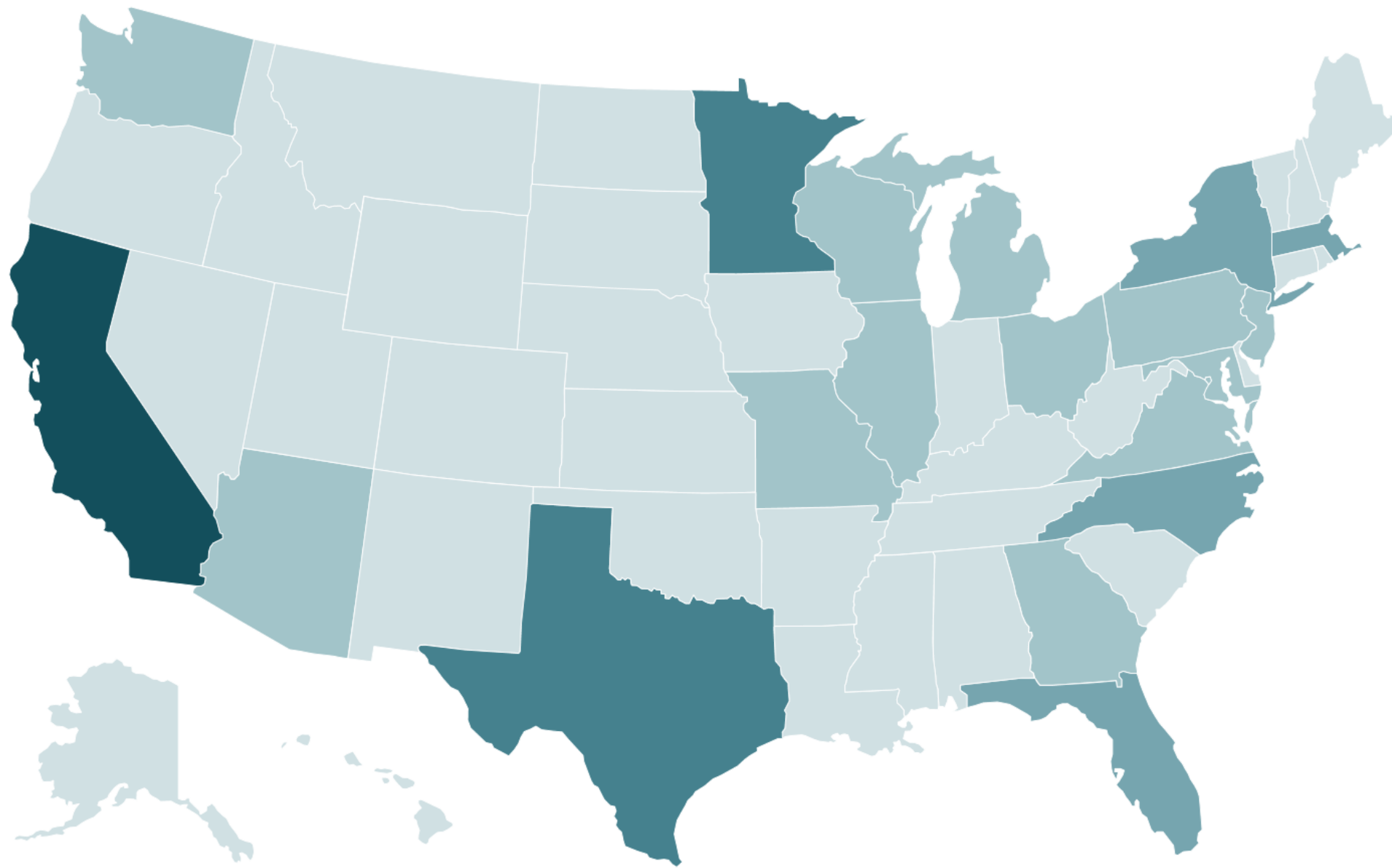
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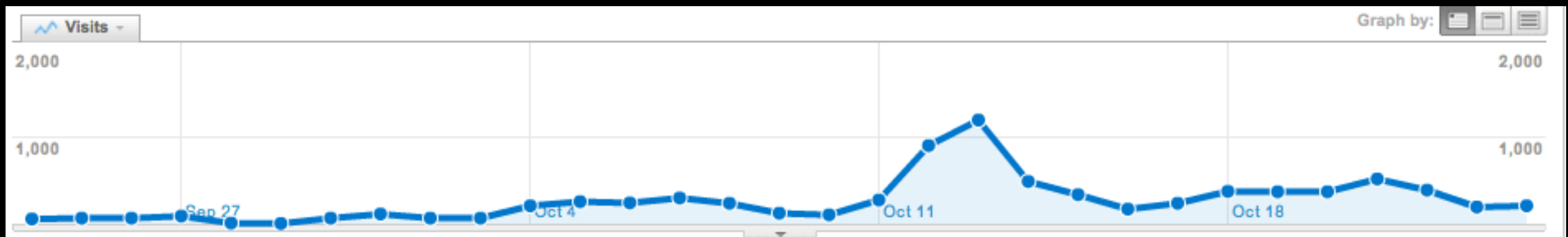


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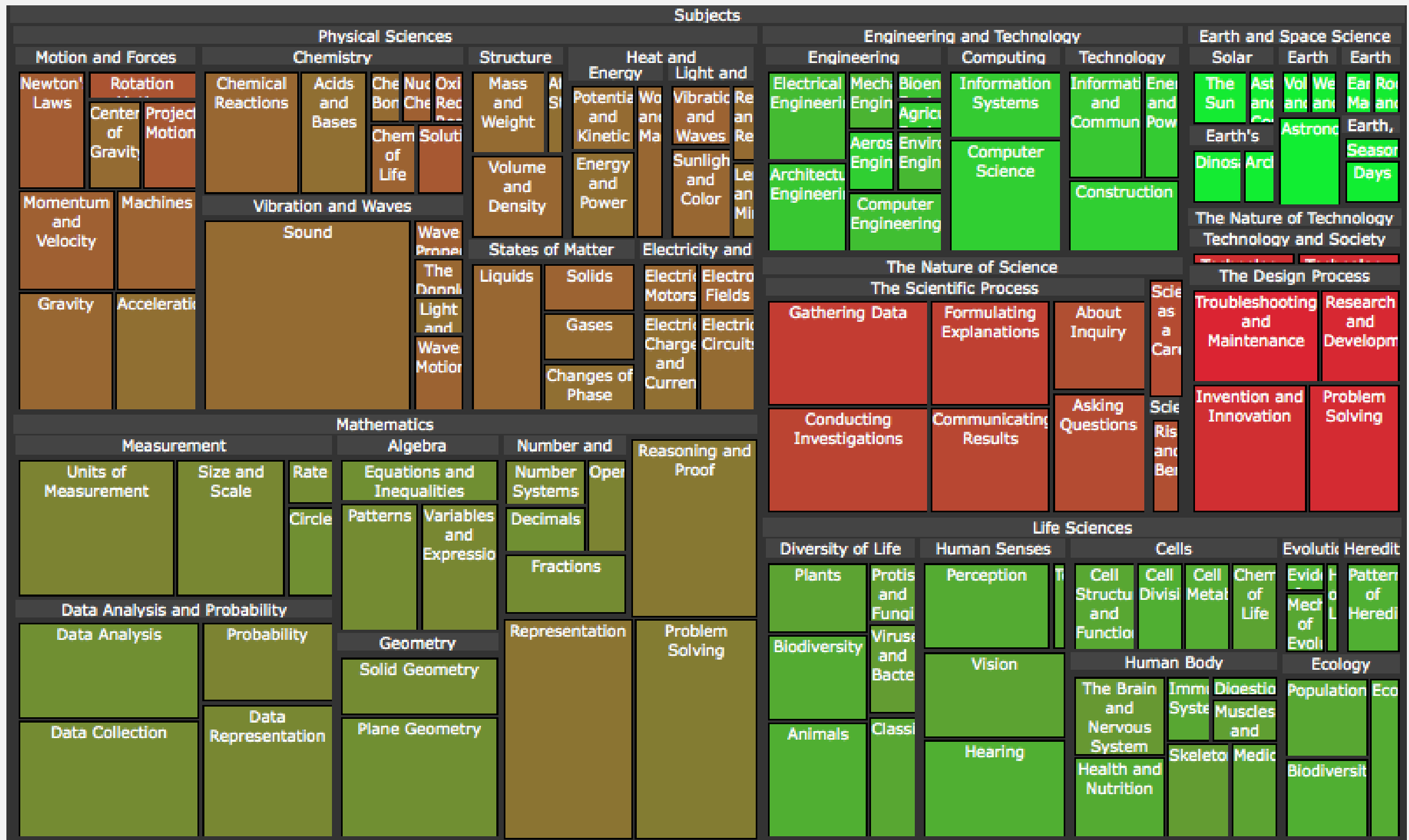
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New NSF Cross-Disciplinary Science Education solicitation

The National Science Foundation (NSF) issued a new solicitation August 24 for grant applications on Transforming STEM Learning. The proposals will draw from work in the four primary DRL programs: Discovery Research K-12 (DR K-12), Informal Science Education (ISE), Research and Evaluation on Education in Science and Engineering (REESE), and Innovative Technology Experiences for Students and Teachers (ITEST). It



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