MSCOPE Big Projects Ideas, December 2005

Team Members: Alessandra Conversi, Nicholas Schwarz

Project: Where do animals live?

This exhibit would consist of a table separated in four areas. Each area represents an ecosystem and would have 4/5 rounded spaces with sensors at the bottom where children have to insert the animal figure.
I was thinking of those 4 different habitats: desert, jungle, pole, and ocean. For each ecosystem a number of 4/5 animals would be chosen. With a total of 16/20 animals children should individualize at which environment the animal belong. The animal would have at its base, rounded base, a sensor, and when the child would guess the right spot for the animal it would make a 'right' sound, on the other hand when it the spot is a wrong one, the sound at the contact between sensors would be a 'wrong' sound. Each animal would be more or less difficult to guess.

MSCOPE Big Projects Ideas, December 2005

Team Members: Alessandra Conversi, Nicholas Schwarz

Project: Playing with 4R

The four R: refuse, reuse, reduce, recycle, are a 'law' of environmental science. This exhibit would consist of a matching/memory game, which can be played in two/three/four etc children. There is a board subdivided in many spinning square, on one side of the board we have a little explanation of the 4 R and some example of those.
Each spinning square would have on the other side a figure of an object and which of the four R you can use this with…another spinning square would have the same object. Until a child does not found the couple he looses her turn and it is the turn of another child. There would be a way for them to keep the score…how many couple they find. It would be just a funny way to learn something more about recycling and that before it there are many way even a child can help. Reducing the amount of water when taking a shower, for example.

MSCOPE Big Projects Ideas, December 2005

Team Members: Alessandra Conversi, Nicholas Schwarz

Project Tilte: Interactive Sound Waves

Move around to make different sound waves in different material and hear it.

The idea behind this is to allow the visitor to see and hear sound waves that they interactively create. We had two ideas for ways a visitor can create waves.

One is by using their arms. A visitor would wave his/her arm in front of a camera. The camera, attached to a computer would interpret the motion. A projected image on a wall shows the sound wave emanating from the visitor's arms, along with an annotation showing the waves properties, e.g. period, frequency, etc. A speaker at the far end of the projected image plays the wave once it reaches it. The extent to which the visitor moves his/her arms affects the properties of the wave that is created. The sound waves can also be simulated as traveling through different materials, e.g. water.

The other way is by using a microphone. In this case a visitor speaks or makes noises into a microphone. The sound input is analyzed and visualized so that the visitor can see the waveforms associated with their voice. The user can also change some properties of their voice like its pitch and hear it played back.

Comments:

- Playing music with lazers?
- Moving round inside a small room?
- Very melodic!
- How about slowing way down or speeding up a sound?
- Would be great to change the overall speed of the wave.
- Try getting real sounds from visitor.
- Start out with theremin?
- Cool =) have you seen that video game where they dance and step on things? That could be a good interface
- Construct a jew's harp w/ variable resonant cavity? (other weird noises whose properties are controlled by play)
- Could you do something with rhythm? Maybe have pop music playing that kids could relate to?

MSCOPE Big Projects Ideas, December 2005

Team Members: Alessandra Conversi, Nicholas Schwarz

Project Tilte: Pressure and Temperature

Create more pressure and higher temperature virtually and see how much energy it takes to move something.

The rough idea behind this is to demonstrate the amount of energy exerting pressure on something has vs. changing something's temperature. Groups of visitors would push a button or turn a knob to increase the pressure in a virtual container or raise the temperature in a virtual container with some liquid in it. The amount the user turns the knob or the number of times the user presses the button directly relates to the increase in pressure or temperature the visitors see. Visitors can work as a group to do something virtually by increasing or decreasing the pressure or temperature, such as boiling water.

Comments:

- What's a good or useful example from daily life.
- Can you make this real-life instead of virtual?
- Thermometer idea where you touch a table w/ alcohol and it moves up.
- solids vs. liquids vs. gases
- different situations?
    - o center of earth
    - o volcano
    - o hot bathtub
- Encourage visitor to participate in group to make things happen
- Hydrolic lifts
    - o Let them hear the sound
    - o Relate to science of low riders
    - o Kids like cars
- Hot air balloons / weather systems?
- i.e. a liquid that boils @ ~37C, so you can warm with your hand, the vapor can go through a small channel + air out a water-wheel type thing (for air) to make a turbine power demo
- Is there a way to build on the soda straw exercise we did today?

MSCOPE Big Projects Ideas, December 2005

Team Members: Tim Donaghy, Brent Sakris, Staci Willis

Project Tilte: Lost In Space

Basic Science: Figuring out how far away stars are is an important concept in astronomy. Historically, this has been the "big" question in astronomy and it still puzzles astronomers today. At first glance, it seems impossible to figure out if something is Bright and Far Away, or Faint and Nearby.

Audience: Slightly older kids 8-12.

Target Museum: Hands-on kids museum (like SciTech).

Concept: A darkened tunnel or room (i.e. floating in space!) where we can play around with lightbulbs of differing brightnesses and distances. A couple of ideas come to mind:
1. Have the kids move a lightbulb along a track until it becomes distant enough to "match" the brightness of a nearby faint lightbulb.
2. Compare "equal" lightbulbs at various distances to observe the law that sources appear fainter as they get farther away.
3. In a dark room with lightbulbs of varying brightnesses and distances, try to get kids to guess which one is closest, and see how we can be "fooled" because we don't know how bright the bulbs are to begin with.

Comments:

- same concept but with sound – useful analogy?
- Use very tiny bulbs or fiber optics – force people to close one eye to avoid parallax.
- Make out box! May promote teen pregnancy.
- Use it to teach about stellar parallax
- Dan Flavin exhibit @MCA (just past) might give you some interesting ideas for the exhibit (he works with large light fixtures)
- Make a constellation in 3D and rotate it to see it from the other side. Does it look only backwards?
- It would need a huge room
- Talk about near and far stars
- Relationship between size of light and distance?
- Parallax?
- Make an exhibit instead of a room and visitor looks inside a big box and moves tiny lights by a crank or something (fiberoptics?)
- Can you get a big enough room? How big is that?
- Instead of a dark room, have glasses with some UV or IR conversion to visible, dots or shapes close by that can only be seen with the glasses, maybe with only 1 eye to eliminate depth perception
- Smaller/dimmer lights the better. Use narror spec frequency light to really freak them out

MSCOPE Big Projects Ideas, December 2005

Team Members: Tim Donaghy, Brent Sakris, Staci Willis

Project Tilte: Encounter with Sound

Live theatrical show experimenting with principles of sound• harmony, rhythm, timbre, volume, etc. How to create sound effects, Participant interaction where volunteers become foley artists

Comments:

- Interactive?
- Provide basic “toolset” and let people make their own
- Use instruments or make music out of single frequency sounds
- Add computer music
- Shows with effects from specific popular movies
- Loop of silent film plays, visitors can make sound effects to match the action? Live actors doing scene would be ok too, and more funny
- Relates science principles to things people know about
- Make your own music piece interactive
- DJ’s at museum• let the visitor do some spinning
- It would be cool to get a group to “write” a collaborative piece of music, and we could give them the mp3 later (from web)
- Turntables?
- Reminds me of an old-time radio show
- Have a video component to some of the sound effects
- Let them record their voice and have track balls and slide switches to change the speed, frequency distance, pitch, and visualize ware with the surface of mercury (liquid) because its pretty and shows waves

MSCOPE Big Projects Ideas, December 2005

Team Members: Tim Donaghy, Brent Sakris, Staci Willis

Project Tilte: Fun with Water/What to know About H20

Demo for MSI -• Lab for SciTech

Original Thoughts -• Explore H20 properties, water cycle, states of water, density (I.e., cool demo with ice and water vapor in a flask)

Comments:

• Why solid water (ice) floats
• Dry ice or freeze things on the fly
• Let them get wet!
• Pressure/density of air and boiling/freezing points
• Make ice crystals from vapors
• Surface tension -• how many drops of H20 can fit on a penny
• Use live freezing of ice and show on video microscope (use a really thin layer of water on black background)
?? Hand cups of water to audience. Have them do something in the end or just drink the water??
• Liquid nitrogen
• Show how if water is cooled to freezing, the most dense H20 is 4 degrees Celsius, which allows a liquid layer to stay all winter and keep lake fish alive
• How water differs from other liquids
• I like it can you make it both a lab and a demo?
• Make snowflakes & see the different shapes
?? Super cooling -• water that nucleates into ice in a second??
?? Superheater water -• boils as soon as nucleotin point is available???
• How water differs from other liquids
• Rain vs. Snow vs. Freezing Rain vs. Sheet vs. etc...
•Why can you skate on ice, but no on other solids

?? -• Indicates we'd like further information

MSCOPE Big Projects Ideas, December 2005

Team Members: Yusra Alsayyad, Pablo Orozco, Chaz Shapiro

Project Tilte: How do Cyclone Vacuum Cleaners Work?

Our team's MSI demo evaluation revealed that museum visitors are generally interested in how everyday things work. The MSI demo department is working on a new suite of demos called "Science Storms" which aims to teach basic science concepts. This Big Idea merges MSI's agenda with its audience's interests.

Potential lessons:

- Main concepts – What is a vortex? What creates it?
- Comparison of cyclone vacuums to weather systems.
- Are cyclone vacuums better than ordinary vacuums? Why/ why not?

Comments:

- Dissect a vacuum to show the important parts.
- Put an object in a vortex so that people can see the air movement
- Make a big mess, then clean it up.
- Vacuum things of different sizes: sugar, cereal, sand, etc.
- Make fun of the RoombaTM.
- Demonstrator could pretend he's a stereotypical vacuum salesperson.
- Life large objects with a vacuum
- Have a visitor controlled variable that can be quantified.

MSCOPE Big Projects Ideas, December 2005

Team Members: Yusra Alsayyad, Pablo Orozco, Chaz Shapiro

Project Tilte: The Physics of Baseball

This Big Idea takes advantage of the recent and long-awaited victory of a Chicago team at the World Series. We would like to show people the hidden side of baseball – the remarkable facts and figures that underlie every game.

Potential lessons:

- How fast must a batter hit a ball to make it leave the park? Why?
- How much force/pressure does that require? What does that pressure do to the ball?
- Why does a curveball curve?

Comments:

- Why do corked bats help? Or scuffing the ball for pitchers?
- With what force does a fly-ball hit a glove?
- What does it take to break a bat? Maybe get a broken bat as an artifact.
- Check out Exploratorium's online baseball exhibition.
- Other sports?
- "I've heard helicopter blades move as fast as a pro's bat."
- Physics of various pitches.
- Compare baseball to tennis.

MSCOPE Big Projects Ideas, December 2005

Team Members: Mary Leighton, Elisabeth Montegna, Keith Vanderline

Project Tilte: DEPTH PERCEPTION (How the GeoWall Works)

- Test Different Visuals on test audience to see what attracts best
- Visual Illusions?
- Beer Goggles
- Psyche mind games
- Include other cues for depth besides parallax, eg. overlap, size (perspective)
- Can do a whole show about illusions and perception w/ geowall
- depth perception glasses: can take & look @ diff things in the museum
- go 4 it!
- Neclair cube
- at what point do people get dizzy? ;)
- check out optical illusions!
- use polarized lenses to see each individually, explanation of polarized filters
- mabye... try some optical illusion patterns

MSCOPE Big Projects Ideas, December 2005

Team Members: Mary Leighton, Elisabeth Montegna, Keith Vanderline

Project Tilte: 3D Solar System (GeoWall with easy to use interface)

• will be very useful with simple interfaces

• show where current & future satellites are going...

• excellent useful idea.

• pick a planet to visit. go there. see how much you'd weigh there

• See how "old" they would be on the different planets. eg. 1 earth year = 3 mercury years, so if you're 10 on earth, you'd be 30 on mercury

• see the planets for your birthday

• big buttons (~3") with photo & name of planet/moon right on the button itself

• when kids touch or click Saturn, have a voice that says "Saturn" out loud -> like a flight attendant voice taking you on a journey through space

• very much needed!

• with each button press, mabhye play a sound? Have a voice say a sentence about what was pressed?

• give them "tour highlights", like toxicity of gas on venus or something like that

MSCOPE Big Projects Ideas, December 2005

Team Members: Glenna Smith, Anthony Todd, Shenandoah Weiss

Project Tilte: Nylon String Demo

Audience: 4th grade and up (adaptable)
Museum: MSI

Cart Demo: Visitors will get to see nylon made before their eyes. Nylon forms at the interface of 2 immiscible liquids, pull the string out with tweezers. Concepts covered are: chemical reaction occurs where 2 reactants meet (interface), nylon monomers are polymerizing to form a long string [if you shake the two liquids together you can make nylon powder]

Comments:

- Really Big! Make string that could stretch across the room.
- Do spiders spin webs this way?
- Can get different color nylon string and add visually stimulating element.
- How do you make nylon of different densities?
- Other synthetics (rayon, etc.)
- History of nylon discovery (it was an accident?)
- Can you test the strength of the string?
- Do they get to touch/take it home?
- Can you use different type of string to show different properties of matter?
- Show examples of nylon rope and what it's used for. Pantyhose are nylon• if nylon is strong why is it so easy to make a hole in them?
- Sounds fun! Probably demonstrate some other principles.
- Add popular nylon products.
- Is nylon durable when not on legs?
- How do you vary what is made?
- Have common nylon items to show afterward. Ex: clothing, stockings.

MSCOPE Big Projects Ideas, December 2005

Team Members: Glenna Smith, Anthony Todd, Shenandoah Weiss

Project Tilte: Geo-Wall application

Audience: 4th grade and up
Museum: Scitech
Open floor Exhibit: build an easy-to-use interface for one or more of the geo wall programs. Large buttons or roll-track balls to maneuver around (i.e. the solar system with no directions required for fun).

Comments:

- Make wireless and pass around-able?
- Add audio. I.E. press Jupiter button and you get taken to Jupiter and hear some facts about it.
- I like it, what type of applications would it control?
- Can visitor choose which 3D world to explore?
- We need this! Train our staff in using the GeoWall.
- Big, colorful buttons. Maybe in shape of planets they lead to (arcade cabinets)
- Very good. Are the buttons for any application or for a specific one?
- Good idea. Who would do this?
- Maybe make a deep sea interactive GeoWall adventure. Kids love the ocean. Maybe make it lake themed because of Midwest location of museums.

MSCOPE Big Projects Ideas, December 2005

Team Members: Glenna Smith, Anthony Todd, Shenandoah Weiss

Project Tilte: Fiber Optic Waterfall

Audience: 4th-8th grade
Museum: Scitech

Open floor Exhibit: build a colorful fiber optic waterfall (with sturdy fibers) whose ends can be plugged into a manifold pointed at a screen to demonstrate that light emerges from the other side of the fiber.
Or, it could be like the colorful lamps at the top with the cascading fibers, and some fibers that maybe have a rigid reinforced bit at the end to make it seem like a pencil. You can buy fluorescent (glow in the dark) contact paper, so we could make it so the kids can write or draw with the fiber optic pen on the contact paper, which makes their picture glow for a few minutes. That would be a lot of fun to build, and pretty too. In fact, it would be fun to build for a Christmas present. Optical fiber is pretty cheap, you can even get it with fluorescent dyes in it so it is inherently colored.

Comments:

- Everyday applications?
- Use lots of different colors so it's really pretty.
- Different colors
- Have fibers of varying sizes (thickness and lengths). Make some really fat/skinny or long!
- Will it pass IR or UV?
- Bending Light
- Show how info travels over fibers
- Have people communicate with each other somehow?
- Large, eye-catching. Could be a huge draw.
- Combine it with prisms and diffraction.
- How about combining with real water.
- Make fibers touchable and really long
- Embed several strands in clear tubing for strength?

MSCOPE Big Projects Ideas, December 2005

Team Members: Glenna Smith, Anthony Todd, Shenandoah Weiss

Project Tilte: Myth Busters/ Science Jokes Stage Show

Audience: Adults (but suitable for 13 yrs +)
Museum: MSI
20 min. stage show: Have a few “mad scientists” either telling science jokes (wacky things scientists have proposed to prove or tried to prove in the past) and/or busting urban legends that have testable components. Mythbusters is a popular show on the discover channel:
“So. You’re minding your own business, filling up your gas tank, when your cell phone rings. Hmmm. Should you answer it? Because you’ve heard you shouldn’t use cell phones near gas stations since they can produce small sparks that can ignite big fires. But wait. Could that actually be true? Sounds like a job for MythBusters! It’s a tough job separating truth from urban legend, but the MythBusters are here to serve. Each week special-effects experts take on three myths and use modern-day science to show you what’s real and what’s fiction. That’s right, they do more than explain how something may or may not be scientifically possible. Through trial and error they actually demonstrate it.”

Comments:

- Bring in experts, comics or from MSI staff
- Brett from MSI would love this. Talk to him.
- Excellent Idea
- Would be a great donor dinner event. Could have showgirls/boys.
- Let people submit a myth to museum and keep count of what they want to know.
- Could poll the audience before and after to see if they’re convinced.
- Real demonstration contradicting the myth. Show it doesn’t happen.
- What if you have the audiences choose the myths.
- Maybe keep to one theme, like dinner table myths or food myths.
- Could be a series, each on a different theme.

MSCOPE Big Projects Ideas, December 2005

Team Members: Glenna Smith, Anthony Todd, Shenandoah Weiss

Project Tilte: Extra ideas

Spider Silk Demo

Audience: 4th grade and up (adaptable)
Museum: MSI or Scitech

Cart Demo: possibly related to Nylon string, depending on spider anatomy (possibly analogous process), model of the spider spinnerets (silk producing organs) to demonstrate how the mechanical system works with the chemistry of silk to produce a fiber that is 5 times stronger than steel and surpassed only by Kevlar.

Supercooling Water Demo

Audience: 6th grade and up
Museum: MSI

Cart Demo: Cart would have a shallow pool of water kept just below 0 degrees. Visitors throw in a stone or touch the water to see the water freeze into crystals before their eyes. Demonstrates supercooling process: chilling a liquid below its freezing point, without it becoming solid: ice crystal formation is delayed due to the absence of efficient ice nucleators.

Polarized sun glasses

Audience: 4th grade and up (adaptable)
Museum: Scitech

Open floor exhibit: possibly related to the geo wall, have large polarizers to spin and/or overlap, while looking at back-lit photos that have a polarized filter, the geo wall, have a parallel explanation set of “polarizers” which illustrate the concept of polarized filters: disks with parallel slats to look at an image or friend on the other side of another disk that is also divided into parallel slats.