



SCIENCE SOURCE

ISSUE 3
FALL 2007

The Louisville Science Center encourages people of all ages to enjoy science, mathematics and technology in a stimulating and engaging environment that is educational as well as entertaining.

A TEACHER'S RESOURCE GUIDE

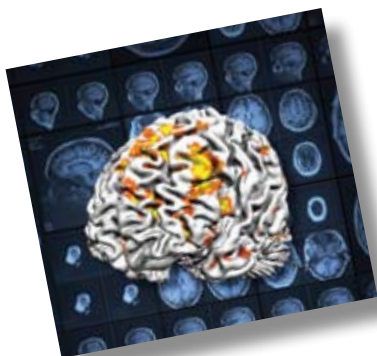


Follow the journey of professional cyclists competing in the Tour de France. Using spectacular computer-generated and medical imagery, witness which parts of the brain are involved in each of the body's functions. Watch athletes face the ultimate test as they avoid danger, stave off crushing pain and fatigue, and seize fleeting moments of opportunity. While peak performance is the key, discover how often the athlete with the fittest mind wins.



Get Your Brain in Gear with WIRED TO WIN!

BRAIN GAIN Field Trip Package



Package includes:

- Admission to **The World Within Us** and all other Science Center exhibits
- The IMAX® film **WIRED TO WIN**
- Your choice of one hands-on brain lab or demonstration
- Lunchroom rental

For details see page 2.

Available September 2007– May 2008

The cost is \$9 per student.

To book the BRAIN GAIN Field Trip Package, call:

(502) 561-6100, ext. 6111 or
(800) 591-2203, ext. 6111

Hands-on Brain Labs:

"Sensory Signals" (Grades 4-6)

Explore the ways your nervous system works. Use the scientific method to learn about sensory receptors in your skin.

"NeuroLab" (Grades 6-12)

Work with a real sheep brain to learn about the parts of your brain and how the brain functions to control your body.

What's In This Issue?

INSIDE THE STORM Package ...pg. 2	IMAX® Films.....pg. 6
MUMMIES Packagepg. 3	Temporary Exhibits.....pg. 7
Early Childhood Programs.....pg. 4	Early Childhood Professional
Distance Learningpg. 5	Development.....pg. 8

INSIDE THE STORM Field Trip Package



INSIDE THE STORM Field Trip Package

Package includes:

- Admission to **The World Around Us** and all other Science Center exhibits
- The IMAX® film **HURRICANE ON THE BAYOU**
- Your choice of one hands-on lab or demonstration (listed below)
- Lunchroom rental

Available September– December 2007

The cost is \$9 per student.

To book the INSIDE THE STORM field trip package, call:

(502) 561-6100, ext. 6111
or (800) 591-2203, ext. 6111

Environmental & Earth Science

“Category 5: Inside the Hurricane” (Grades 4 -12)

Discover the atmospheric ingredients that are needed to produce a hurricane as you learn how meteorologists predict the path of these massive storms.

“Follow That Drop” (Grades 4 – 7)

Expand your knowledge of the water cycle and learn why keeping our water clean is important as you filter a sample of dirty water.

“Washed Away: Erosion” (Grades 4-7)

Follow the flow of water through a stream table as you design a way to divert a moving stream. Learn how erosion and deposition affect living things.

Life & Health Science

“Outbreak Control” (Grades 4 – 12)

When a hurricane hits, disease outbreaks often occur. Can a doctor use the same antibiotic to treat these infections?

“Stuck in the Muck” (Grades 5 – 12)

Learn to use a compound microscope and explore the microscopic world left behind in an area after a hurricane.

“The Aftermath: Microbiology After the Storm” (Grades 7 – 12)

Use a compound microscope as you prepare and stain slides for observation and categorization of various microorganisms that could be found in a water source after a hurricane.

Physical Science

“Forces of Nature” (Grades 4-12)

Hurricanes, earthquakes, tornadoes, oh my! Explore the forces of nature and the importance of strong structural designs to withstand those forces.



Environmental science education programs at the Louisville Science Center are supported by a grant from LG&E, an E.ON Company.



SPRING 2008

MUMMIES Field Trip Package



MUMMIES Field Trip Package

Package includes:

- Admission to the Discovery Gallery and all other Science Center exhibits
- The IMAX® film MUMMIES: SECRETS OF THE PHARAOHS
- Your choice of one hands-on lab or demonstration (listed below)
- Lunchroom rental

Available January-May 2008

The cost is \$9 per student.

To book the MUMMIES field trip package, call: (502) 561-6100, ext. 6111

—or— (800) 591-2203, ext. 6111

Exhibit Connections: From the Valley of the Queens...

The Science Center's ancient Egyptian mummy and sarcophagus (coffin) made their way to America for the 1904 St. Louis World's Fair and have been exhibited in Louisville since the 1920s. Although the Science Center is lucky to have such a valuable ancient Egyptian artifact, its presence has brought more questions than answers. Medical and historical information indicate that the mummy has traits indicating it is a female, but craniometrics of the skull suggest that it may be male. The sarcophagus itself adds another layer to the mummy's mysterious identity. A number, 221, on the side of the coffin, has been traced back to the legendary Valley of the Queens and belonged to a person, Tchaenhotep. However, records from the excavation site do not necessarily indicate that this particular mummy belonged in this particular coffin. To investigate the mysteries behind the mummy and the accompanying sarcophagus visit the Discovery Gallery on the second floor of the Louisville Science Center.



Visit the Discovery Gallery to see the Science Center's mummy and other ancient artifacts.



Environmental & Earth Science

"Mummies Unpeeled" (Grades 3-5)

Discover the techniques that the Ancient Egyptians used in the mummification process as you "preserve" your own apple to bring back to the classroom for prolonged observations.

"Sacred Insects: Ancient Egyptian Insects" (Grades 3-7)

Reveal the secrets behind sacred Egyptian insects. Learn why scarab beetles, honey bees and butterflies were some of the Egyptians favorite insects.

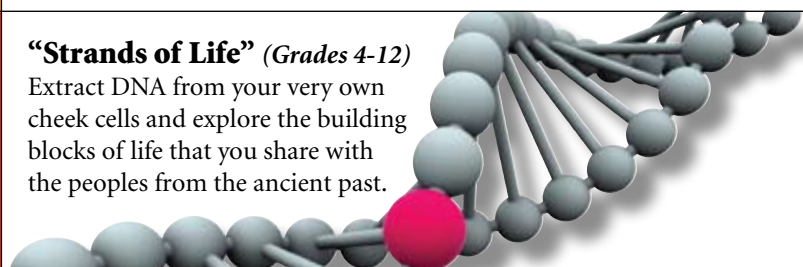
"MSI: Mummy Science Investigation" (Grades 5-8)

Using modern scientific methods you will investigate replicas of the Science Center's own mummy to explore its secrets.

Life & Health Science

"Strands of Life" (Grades 4-12)

Extract DNA from your very own cheek cells and explore the building blocks of life that you share with the peoples from the ancient past.



Physical Science

"The Mysteries Within" (Grades 3-8)

Learn which chemicals work best for preservation and mummification, and how these chemicals have helped mummies to stand the test of time.

EARLY CHILDHOOD

These 40-minute, hands-on labs are designed to keep your young scientists moving and learning as they explore the wonders of science!



EARLY CHILDHOOD LABS

“Little Scientists Lab” (Ages 3-8)

Practice being a scientist using magnifiers, pipettes, plastic test tubes and beakers. Designed to give early learners their first experience in conducting an experiment, this lab is sure to spark the curiosity of your students!

“Insect Life Cycle Lab” (Ages 3-8)

Learn about the lifecycle of mealworms and darkling beetles by conducting experiments to discover these creatures’ basic needs.

“Owl Pellet Dissection Lab” (Ages 4-8)

Explore food chains and webs by dissecting owl pellets to find out what animals are among the barn owl’s favorite foods.

KinderScience Mornings

KinderScience mornings are filled with programs designed for students age 7 and younger, and for these mornings only, no big kids are allowed! KinderScience mornings fill up quickly so make your reservations soon!

To register, call (502) 561-6100 Ext. 6111

KinderScience Dates:

October 24, 2007 • December 12, 2007 • February 27, 2008 • April 23, 2008



Try this... in your Early Childhood classroom!

Spoon Chimes



The Science Behind It: Sound travels in waves or vibrations. The vibrations generated by hitting metal against a surface travel up the string and resonate in your ear.

Materials: String, metal spoons, forks, other sizes and kinds of spoons.

Directions: Tie the handle of a spoon in the middle of a piece of string approximately two feet in length. Wind a little of each end of the string around your pointer fingers and put the wound string next to your ears. Swing the spoon and bang it into something hard like a table. The beautiful sounds will surprise you. Swing the spoon into a variety of different materials. Do you notice any differences in the sounds? Can you feel the vibrations in the string? Now try a fork or a different size of spoon. Do you notice any differences in the sounds? What do you predict will happen with a wooden spoon? A plastic one? How could you change the experiment? Where else do you feel sound vibrations? What can sound travel through? Try it out!

Did you know?

You can bring your Pre-K to 2nd Grade students to **KidZone** during your visit! **KidZone** is an area designed to encourage the curiosity and imagination of students age 7 and younger. This thematic play area gives younger students the chance to explore careers as they try their hand at being a mail carrier, a doctor, a bus driver, an astronaut and an airplane pilot.

KidZone sessions are scheduled, so be sure to ask if there are spaces available when you book your visit. Admission to **KidZone** is included in the price of admission to the Louisville Science Center.

KidZone and early-childhood education programs at the Louisville Science Center are sponsored by Kentucky Education Savings Plan Trust.

Early
Childhood
Professional
Development
See Page 8

DISTANCE LEARNING

The Louisville Science Center offers a menu of hour-long Distance Learning programs which are designed to support National Science Standards in science, math, and technology! Students have the opportunity to perform experiments while participating in a live, interactive VideoConference link. Each program includes an equipment kit of supplies, pre-lab and post-lab activities, and suggestions of ways to expand the learning.

CHEMISTRY

Chemistry Roots (*Grades 4-12*)

Take a hands-on approach to learning about the history of chemistry and industry in this region. From soap making to distillation, fried chicken to coal, explore Kentucky's rich heritage through hands-on chemistry.

SPACE SCIENCE

Star Station One™: Living And Working In Space (*Grades 3-12*)

What kind of physical and mental training do astronauts undergo before blastoff? What are the challenges of working and living in space and how do they overcome them? Learn about the International Space Station while training to be an astronaut.

HEALTH SCIENCE

Transmission Tracker (*Grades 6-12*)

Someone in your class has a deadly disease! Watch it spread. Follow its path. Use the tools of an epidemiologist to solve the mystery. Investigate how epidemics are spread and learn how to protect yourself.

PHYSICAL SCIENCE

The Force Is Right (*Grades 2-12*)

Learn about the physics of building bridges, skyscrapers, houses, and even sculptures as you explore balance, tension, compression and flexion forces with hands-on models.

Wave Watch (*Grades 2-12*)

Get ready to catch a wave! Discover the waves around you – light waves, sound waves, water waves, infrared waves and electromagnetic waves – as you explore the science and properties of each, and how they affect your daily lives.

Physics Rules (*Grades 2-12*)

Why do curvy roads have lower speed limits than straight roads? Do rain and ice affect road friction? Discover how Newton's three laws of motion plus friction, centripetal force and reaction time have shaped traffic laws.

To book: Please call (502) 561-6100 Ext. 6111*

* A signed purchase order or full payment is required to book.

Program Fees: In-State \$100/ program;
Out-of-State \$175/ program



**NOW
OFFERING...
ON-SITE
SPACE
PROGRAMS!**

The Louisville Science Center was chosen as one of two Science Centers to participate in the Virtual Space Community: a partnership led by Space Center Houston in coordination with N.A.S.A. Our interactive space programming is comprised of 20-minute private demonstrations that cover a variety of subject areas including:

- What life is like for astronauts living in space
- Robots and robotics in space
- Life on the International Space Station
- Research being conducted in space

This program largely focuses on math and science content and is conducted at the Louisville Science Center.

To reserve a private demonstration please call:
(502) 561-6100 Ext. 6111 or (800) 591-2203 Ext. 6111

Other teacher resources for space science can be found on www.virtualspacecommunity.org

IMAX® FILMS

HURRICANE ON THE BAYOU

Now showing through January 2008

HURRICANE ON THE BAYOU carries students beyond news headlines on a journey deep into the soul-stirring heart of Louisiana. Unfolding against the poignant backdrop of the most costly natural disaster in America's history, IMAX cameras explore the electrifying culture of New Orleans as a group of legendary and rising musicians recount their heart-wrenching, personal stories of Katrina. **HURRICANE** focuses on the rapidly disappearing wetlands, which are New Orleans' first line of defense against deadly storms.



THE LIVING SEA

Now showing through May 2008

Come face-to-face with humpback whales, life-size on the four-story-tall IMAX® screen. Swim among thousands of golden jellyfish and witness the bizarre spawning behavior of giant clams. Today, the sea represents some of the last unexplored regions on the planet. The potential for exciting discoveries on this new frontier is limitless, allowing us to learn more about how the harmonious balance of sea life, and life on Earth, may be maintained. Enjoy the music of Sting as you explore worldwide locales and learn how life is dependent on the health of the sea.



WIRED TO WIN

September 8, 2007– May 2008

For more information on current and upcoming IMAX films, visit www.LouisvilleScience.org/imax.



MUMMIES: SECRETS OF THE PHARAOHS

January 2008–May 2008

MUMMIES: SECRETS OF THE PHARAOHS is a walk back thousands of years to the wonders of ancient Egypt, a real-life "Indiana Jones" adventure complete with thieves and hidden treasure, and a modern day scientific journey to extract clues about our past. This film tells the story of one of the greatest finds in modern history: the late 19th century discovery of a cache of forty mummies, including twelve Kings of Egypt, among them the legendary Rameses the Great.



TEMPORARY EXHIBITS



Animal Secrets

September 29, 2007-January 1, 2008

Where does a chipmunk sleep? What does an eagle feed its young? How do mother bats find their babies in a cave? In **Animal Secrets**, learn the answers to these questions and more as you explore the hidden habitats and secret lives of forest animals. Using hands-on activities, discover nature from an animal's point of view in naturalistic environments, including a stream, woodland, meadow and cave.

Animal Secrets was created and is circulated by the Oregon Museum of Science and Industry, Portland, Oregon. The exhibit was made possible with funds provided by the National Science Foundation.



Flip It, Fold It, Figure It Out!

September 29, 2007-January 1, 2008

Flip It, Fold It, Figure It Out! offers engaging activities with patterns, shapes and sizes that entice you to "play with math." Form tile shapes into pleasing patterns, fold paper into origami and compare how much different containers hold—as you exercise skills in measurement, arithmetic and geometry.

Flip It, Fold It, Figure It Out!

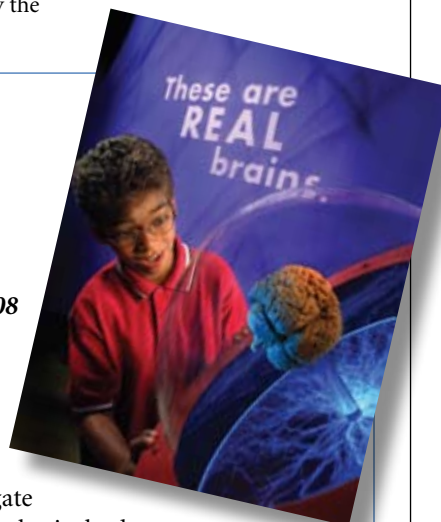
This exhibit was developed by the Museum of Life and Science in Durham, North Carolina with major funding from the National Science Foundation. The traveling exhibition is managed by the Association of Science-Technology Centers Incorporated.

Sponsored locally by **National City**.

Brain: The World Inside Your Head

February 23– May 4, 2008

Brain: The World Inside Your Head introduces you and your students to an extraordinary organ—the brain. Investigate neurons, synapses and the brain-body connections. Meet people with extraordinary brains, such as Albert Einstein, and explore the mystery of the origin of the mind. Learn more about brain disorders and how drugs affect the brain, then conclude your investigation with an exploration of one of the biggest mysteries of all—the purpose of dreams.



Sponsored nationally by **Pfizer**

MISCELLANEOUS

Early Childhood Professional Development Workshops

Did you miss out on our week-long Early Childhood Teacher Institute this summer? Don't worry! We provide 6-hour professional development opportunities throughout the school year. Each workshop is taught by a CHFS certified credentialed trainer includes activity ideas about sound, light, properties of matter, creature science and earth science.

The cost is \$30 per participant.

To register call

(502) 561-6100 Ext. 6111

Workshop Dates

November 10, 2007

January 26, 2008

March 27, 2008



Sunset Science Lectures

November 2- AD/HD
with Judith Axelrod, M.D., Behavioral
Development Pediatrician &
December 7- Autism with Anne Gregory,
President of FEAT of Louisville, Inc.,
for more information call
(502) 561-6100
Ext. 6111

GENERAL FIELD TRIP INFORMATION

To book a field trip, call (502) 561-6100 Ext. 6111 or (800) 591-2203 Ext. 6111

For a complete listing of educational programs, go to <http://www.louisvillescience.org/site/teachers/>

FREE FIELD TRIPS!

Research!Louisville

Research!Louisville at the Louisville Science center 2007 will give middle school and high school students and teachers from across the state the chance to interact with a top Louisville researcher during a fun and informative presentation. Win a FREE trip for up to 60 middle school or high school students during Research!Louisville.

Dates: October 16-19, 2007.

Information and applications available beginning August 24, 2007 at <http://www.louisvillescience.org/teachers>

WE NEED YOUR OPINION!

FILL OUT A SURVEY for a chance to win a FREE field trip for up to 30 students. <http://www.louisvillescience.org/teachers>

TRY THIS... IN YOUR CLASSROOM

Cabbage pH

Before You Begin:

Even though you'll be dealing with food products throughout this experiment, you are not making anything edible. **Don't eat or drink the experiment!**

Do you know that you can use red cabbage to determine if a substance is an acid or a base? Start this experiment by making a red cabbage indicator.

INGREDIENTS:

Red cabbage
Lemon juice
Baking soda
Water
Saucepan
Strainer
Storage jar
Teaspoon
Small paper cups

Instructions:

Tear half the red cabbage into small pieces. Put the pieces in the saucepan with enough water to cover them. Simmer the cabbage until the solution turns a dark purple. Turn off the heat, and let it cool for about half an hour.

Pour the cooled cabbage liquid through the strainer into the storage jar. The liquid is the "red cabbage indicator" for your experiment. If you're not going to experiment immediately, refrigerate it to keep it fresh.

Prepare for your experiment by pouring 1/4 cup red cabbage juice into each of the three cups. Place one teaspoon each of the lemon juice, water and soda into individual cups. How do the liquids change?

Because it is an acid, lemon juice turns the indicator pink. Water is neutral (neither acid nor base), so the indicator stays purple. Baking soda turns the indicator blue-green because it is a base. Search for other household chemicals, and test their acidity. Some suggestions: aspirin, ammonia, soaps, vinegar, bleach, 7-up® or other clear soda. **Please do not experiment with strong acids or bases. They are hazardous chemicals that may burn the skin and require protective gloves and eyewear as well as good ventilation.**

