Digital Library After School Project

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The Exploratorium
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Digital Library After School Project

- To bring more science and math enrichment into out-of-school time using resources from the Exploratorium’s Digital Library and NSDL.org
- Offer professional development workshops designed for both professional development providers and after school educators to build capacity to deliver STEM content-rich afterschool activities to learners in the 4th through 12th grades.
- A collaboration between the Exploratorium, CalSAC, and the National Science Digital Library
- Funded by National Science Foundation (NSF #0532756)
The California School-Age Consortium

At CalSAC, we work to support and advance afterschool and out-of-school time programs and providers throughout California. We offer training, resources, advocacy, and information to help these professionals in their vital work with kids.

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www.calsac.org
Afterschool Module Components

- Digital Videos
- Printable instructions
- Concept map
- Tips for “Going Further”
- Suggested links to background science

www.exploratorium.edu/afterschool/activities
Ice Balloons

Introduction
An introduction to the Ice Balloons activity, in which learners explore globes of frozen water and learn how to ask and then answer ‘investigable’ questions.

- Get activity instructions
- Download concept map
- Going further

Recommend the Ice Balloons activity to a friend

Search for more activities in our digital library
Cup Speaker

Introduction

An introduction to how to make your own simple speaker, which transmits sound from a radio or MP3 player and demonstrates the principles of electromagnetism and vibration.

- Get activity instructions
- Download concept map
- Going further

Recommend the Cup Speakers activity to a friend

Search for more activities in our digital library

Digital Library
Color Chromatography

Step-by-Step Demonstration

A detailed demonstration of how to do the Color Chromatography activity, which lets you see the colors hidden in black ink. Includes a discussion of materials needed.

- Get activity instructions
- Download concept map
- Going further

Recommend the Color Chromatography activity to a friend

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Cup Speakers Afterschool Activity

Make your own simple speaker so you can listen to your favorite radio station. Just wind a coil, attach it to a cup, hold a magnet nearby, and listen. This activity explores electromagnetism and teaches about the way sound moves, from a singer’s vocal cords, though radio waves, and all the way to a listener’s ear.

When you plug the headphone cable into your sound source, the sound (in the form of an electric current) goes out the wire, through the coil, and out the other end. When electric current goes through a coil of wire, the coil of wire becomes an electro-magnet. When electric current goes around the loop clockwise there is a south magnetic pole nearest you; when the electric current reverses there is a north magnetic pole.

TEACHING TIPS

- Try using different kinds of cups to get different qualities of sound.
- Turn the activity into a game of "how to make the best sounding speaker" with a range of materials.
- Stronger magnets like neodymium magnets work best.
Black Magic (Color Chromatography)

With a paper towel, a black marker, and a cup of water, discover the secret colors hidden in black ink. Explore capillary action—how the water moves up the paper—and chromatography—how different elements of the ink are carried along at different rates, allowing you to see that black ink is actually made up of many different colors.

What Do I Need?

- absorbent paper (paper towel or coffee filter)
- scissors
- black marker (water-based)
- water
- cup or mug

What Do I Do?

1. Cut a strip of the paper towel or coffee filter. Make it about 2 inches (5 cm) wide and 5 to 6 inches (13 - 15 cm) long.

2. With the black marker, draw a line across the strip, 1 to 2 inches (2 - 5 cm) up from and parallel to the bottom.

3. Put some water in the cup—

the bottom of the strip is in the water, but the black mark is not in the water.

5. Watch as the water flows up the paper. When it reaches the black line, you’ll start to see some different colors moving up the paper strip.

6. Leave the paper in the water until the ink has moved up the strip.
Background Science

Color Chromatography
A web-based interactive where you mix and match millions of different background colors using just red, blue, and green.
http://www.exploratorium.edu/exhibits/mix_n_match/
Ages: 9+

White Light and Colored Light
Two activities in which learners “take apart” white light and then “put it back together again.”
Ages: 5+

Extending Paper Chromatography inquiry
Learn how to make simple modifications to a standard paper chromatography lesson.
Ages: 11+

Molecular Expressions: Color Separation
An interactive simulation for introductory physics students that explores how individual subtractive primary colors can be separated from a full-color photograph.
http://micro.magnet.fsu.edu/primer/java/primarycolors/colorseparation/
Ages: 15+

Primary Colors of Light and Pigments
An interactive activity that teaches about the primary colors of light and pigment.
http://www.teachersdomain.org/resource/isps07.sci.phys.energy.lightpigment/
Ages: 11+

How We See: The First Steps in Human Vision
Activities (and an article) exploring ancient vs. modern theories of vision.
http://www.accessexcellence.org/AE/AEC/CC/vision_background.php
Ages: Educator

Back to Color Chromatography videos
Available in Multiple Formats

• DVD
• Portable Media on iTunes
• On the Web
Apple iTunesU - Beyond Campus/NSDL /General Science

hands-on science activities