

## 2009 Science Workshops for Home Educators and their Families

*For details about registration, costs, and times go to*

[http://www.paperdiscoverycenter.org/general/sci\\_home\\_ed\\_flyer.pdf](http://www.paperdiscoverycenter.org/general/sci_home_ed_flyer.pdf)

**Jan 13 – Forces**

**Jan 20 – Color**

**Jan 27 Moved to Feb 3 –  
Photography**

**Feb 3 – Flying Objects**

**Feb 10 – Thermal Energy**

**Feb 17 – Water**

### **Explore forces with experiments using paper**

Learning Objectives: Understand what a force is and the types / categories of forces, and that forces can be applied over a distance to do work. Experiment with applications of forces.

- Make a paper doll dance with electro-magnetic force
- Break a piece of wood with newspaper and lift paper cups without touching them, as you explore the power of gas pressure
- Explore Bernoulli's principle and its applications
- Identify the center of mass, experience the impact that center of mass has on balance
- Experiment with magnets of different strength, learn what makes them different
- Work as a team with equal and opposite forces to solve a problem

### **Explore the world of color**

Learning Objectives: Understand how we see colors and why things are the color they appear. Experiment with applications that use color changes

- Burn flames of many colors, showing where the color in fireworks comes from
- Learn how the human eye detects color
- Understand the difference between emitted and reflected colors
- Make colored paper with dyes present in common veggies and explore how some are sensitive to acidity level
- Explore the sky color during the day and during sunset and sunrise.
- Experiment with chemical tests that unveil hidden messages through color changes
- Solve a crime using chemical tests that involve color

### **Explore photography**

Learning Objectives: Experience the application of science principles – chemical changes and optics - in the often taken for granted world of photography.

- Learn how to develop a picture in a dark room and the science behind it
- Explore what is special about photographic paper
- Experiment with the variables involved in the optics of taking a photograph

### **Explore 'flying' objects using paper**

Learning Objectives: Expose students to fun tools which can be used to run experiments and perform scientific exploration.

- Make kites out of paper
- Make paper rockets and launch them into the air
- Make a paper trebuchet and launch projectiles across the room
- Use origami to make birds out of folded paper
- Talk about the science variables for each of the objects and what experiments you could do as a follow-up

### **Explore the world of thermal energy**

Learning Objectives: Understand what energy is and how to recognize the presence and transfer of energy. Explore how temperature relates to thermal energy and how thermal energy is connected to changes in states of matter. Experience product applications which use thermal energy and experiments which transfer thermal energy.

- Observe science demonstrations with dry ice and liquid Nitrogen
- Learn about these amazing cold substances and what they are used for
- Explore the science behind paper that is sensitive to temperature

### **Fun with Water**

Learning Objective: Review the states of matter and transitions between liquid / gas states with water, understand the characteristics of water that make its high surface tension, as well as means to adjust this surface tension, and how this leads to interesting applications.

- Explore the connection between water and paper
- Boil water with ice cubes
- Be fascinated by surface tension - – float metals which you think should sink, see how big a water drop can get, stand inside a giant soap bubble.