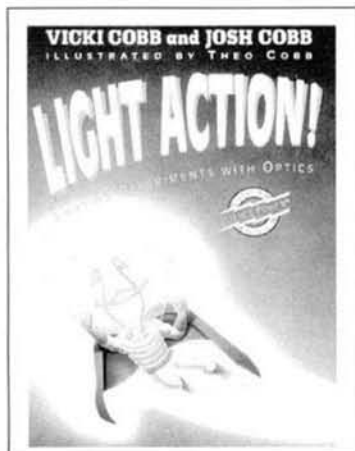


Light Action! Amazing Experiments for Children

Light is still an enigma, although some of the best minds have tried to figure out exactly what it is. Thousands of years ago, the Greek engineer, Hero, thought that light was sent out of our eyes as a "feeler." Since then, we have tried to quantify it, measure it, and theorize about it. Although we still do not know exactly what it is, we do know what we can do with it.

When great scientists are stumped they may resort to their playful imaginations. Playing allows their minds to become free and, although playing generates ideas that may appear foolish and absurd, occasionally, a "foolish" idea breaks a discovery wide open.

It is not difficult to teach kids how to play with science, and optics is a great place to begin. Here are two fun-filled activities to get them started.



LIGHT ACTION, BY VICKI COBB AND JOSH COBB, IS AVAILABLE FROM HARPER COLLINS PUBLISHERS.

JOSH'S LAW OF REFLECTION: YOU CAN TURN TELEVISIONS ON WITH MIRRORS

To set up, you will need a wireless remote control television (TV) with fresh batteries in the controller and several mirrors. Every remote controlled TV has a small detector near the screen that detects the infrared energy from

the controller when a button is pushed. Locate that detector on your set.

Start off by turning your back to the TV and looking at it with a mirror. Hold the remote control up to your eye and aim into the mirror at the TV's detector. From this position you should be able to operate the TV.

Now step out of the room, and have someone else hold the mirror in the doorway to the TV room so that you can see the TV's detector in the mirror.

Turn your back to that mirror and look at the mirror through a second mirror. You should now see the TV through two mirrors. Aim at the detector by holding the controller up to your eye and FIRE! You can experiment with as many mirrors as you like and with as many angles as you like. Let the kids discover many elaborate ways to change channels. My record is four mirrors down the stairs from the second floor of my house.

Here's why it works: Light energy reflects off surfaces the same way regardless of the color or wavelength of the light. By looking into the mirrors at the TV you are seeing the light that has come from the TV, bounced off the mirrors, and entered your eye. The remote controller uses invisible infrared light to control your TV. If you start the invisible light at your eye, it will take the same path as the visible light and bounce off the mirrors to the TV's detector.

WATCH TV UPSIDE DOWN ON A PIECE OF PAPER

To set up, you will need a TV, a magnifying glass, and a piece of paper. Turn

off the lights and turn on the television. Stand about 10 feet from the TV and hold the magnifying lens so it faces the TV. Move the paper back and forth until you can see a clear image of the screen. Now, let the kids play with it! Tell them to move closer to the TV and see if the image gets larger or smaller. Ask them if the image looks different from the real thing. See if they like the idea of an upside down and backwards movie theater.

Why it works: This is a fun experiment that gives kids (and adults) a practical understanding of how a lens

creates an image. The lens refracts light that diverges from each point on the TV and brings it together to single points on the image. Thus, the image has a light construction similar to the object.

When I have done this experiment with kids, it seemed odd to me that a common comment was, "Wow! The picture is in color!" Upon reflection (no pun intended), this kind of observation is a perfect opening to learn about color. In science, one discovery inevitably leads to another investigation.

