

## Rattleback

A **rattleback**, also known as a "celt," "Celtic stone," "rattlerock," "spin bar," "anagyre," "Tate's," "wobble stone" or "wobblestone," and by the product names "ARK," "Bizzaro Swirls," "RATTLEBACKS," "Space Pet" and "Space Toy," is a semi-ellipsoidal top which will spin on its axis in a preferred direction. But, if spun in the opposite direction, it becomes unstable, "rattles", stops and reverses its spin to the preferred direction.

*Behold the mysterious celt,  
with a property that amuses.  
One way it will spin,  
the other way it refuses.*



This spin-reversal motion seems, at first sight, to violate the angular-momentum conservation law of physics. Moreover, for most rattlebacks, the motion will happen when the rattleback is spun in one direction, but not when spun in the other. These two peculiarities make the rattleback a physical curiosity that has excited human imagination since prehistorical times.

## Fortune fish

Watch as the fortune teller miracle fish's movements decide your fortune!  
This is a classic novelty that makes a little plastic "fish" the "fortune telling mind reader."  
Place the magical red Fortune Telling Fish on the palm of your hand and watch it begin to move, wiggle, curl up or flip off your hand all by itself! Kids love them! Great for in-class demonstrations. For more fun, look on the back of the special envelope to see the movements meanings. Are you independent? Are you fickle? Are you in love? See what the Fortune Telling Fish has to say about you!

So, how do they do what they do? They are long-strand polymers that actually GRAB water molecules. They will grab only on the side of the direct contact. It doesn't absorb, it just grabs. One side swells up with the added volume of water and curls just like a bi-metallic strip with heat. The polymer is used commonly in baby's diapers! Cool!



# Talking strips



Attach the start end of the recorded strip with a piece of tape, a label or a knot.

Slide your thumbnail down the strip.

Whatever it's attached to, **WILL TALK OUT LOUD !!!**

**YES, IT REALLY IS THAT SIMPLE!**

When you rub your fingernail against the plastic strip, it rides over a series of ridges in the strip. This makes the strip vibrate. And the ridges are made just right so that the vibration makes a particular sound -the speech that you hear. The point of the cup is to the amplify this sound so that you can hear it.

The talking strips can also make a balloon talk (hold the end of the strip against the balloon) or a box. Also, you can use something other than your fingernail -how about a penny?

# Tornado bottle

This consist of two bottle-caps glued together, with a hole in the middle. Screw this on a bottle filled with water and then screw a second, empty, bottle on the other side.

When you reverse the bottles, it will take about 20 seconds for the upper bottle to get empty.

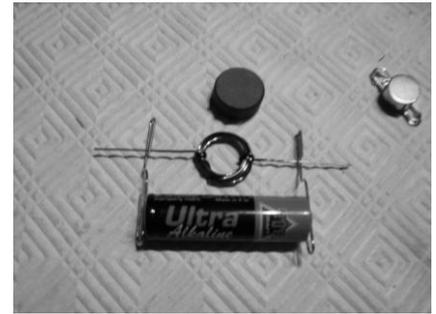
But if you reverse the bottles while giving it a spin, the upper bottle will get empty in only 5 seconds.

When you spin the bottles, the water will act as a tornado. Because the water gets at the outer side of the tornado, the air can move upwards.



# The paperclip-motor

Use the battery to make a coil of 10 windings with the enamelled copper wire. Leave ends of about 10 cm. Turn the end two times around the coil at 180° from each other. Remove the varnish at the end of the copper wire with sandpaper. Open the two paperclips and put them at the two ends of the battery. Slip the ends of the coil into the paperclips. Hold the battery near the coil. It will start turning.



# UV-beads

UV Beads have a chemical substance embedded into the plastic that will change color when exposed to UV radiation (sun light). The beads will remain white indoors as long as they are kept away from windows or doors where UV light can leak into the room.



**Light Test** -- Place a handful of UV beads near a fluorescent light. Do any of the beads change color? Can you get a sun burn or a tan by sitting next to a fluorescent light?

**Black Light** -- "Black light" (long wave ultraviolet light) can also be used to change the color of the beads. You can purchase a black light at many specialty stores or hardware stores that have a large section of light bulbs. Sometimes those high intensity lights (mercury vapor) found in a gymnasium emit just enough UV light to make the beads barely change color.

**UV Filters** -- Test a variety of glass and plastic containers to determine which materials block out UV light. Place different transparent filters between a UV light source and the beads. Try eyeglasses and UV absorbing window film. You will find that the front windshield of most automobiles absorbs UV radiation. Usually the side windows do not have this built-in protection.

## How does it work?

The UV Beads contain different pigments that change color when exposed to ultraviolet light from any source including the sun. The beads are all white in visible light. In UV light, depending on the pigment added to each bead, you will see different colors. Each bead will change color about 50,000 times before the pigment will no longer respond to UV light.

The term light is often used as a generic word to describe many different forms of light such as incandescent light, fluorescent light, or sunlight, for instance. However, not all light is made up of the same energy. Using Energy Beads, you will be able to uncover an invisible form of light energy called ultraviolet light. None of the energy in the ultraviolet region of the light spectrum is visible to the naked eye.

Just as there are many different colors of wavelengths in the visible spectrum (red, yellow, green, blue...), so are there many wavelengths of ultraviolet light.

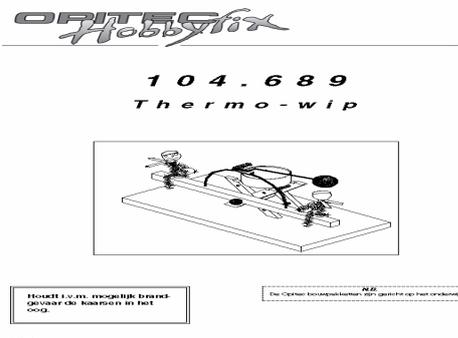
First, there is long wave ultraviolet light (300 to 400 nanometers), which most of us recognize as "black light" • the light that is often used to make decorations glow in discos and theatrical productions. Long wave UV passes easily through plastic and glass.

Short wave ultraviolet light (100 to 300 nm) is used to kill bacteria, hasten chemical reactions (as a catalyst), and is also valuable in the identification of certain fluorescent minerals. Unlike long wave UV, the short wave UV cannot pass through ordinary glass nor most plastics. The shortest wavelengths cannot even travel very far through the air before being absorbed by oxygen molecules as they are converted into ozone.

UV Beads are the perfect tool for understanding how solar radiation can be harmful and to recognize preventative measures that can be taken to reduce the risks associated with exposure to sunlight. When you expose bare skin to sunlight, your skin will either burn or tan (which doctors warn is still not healthy for your body). UV radiation wavelengths are short enough to break chemical bonds in your skin tissue and with over prolonged exposure, your skin may wrinkle or skin cancer may appear. These responses by your skin are a signal that the cells under your skin are being assaulted by UV radiation.

## Thermo-seesaw

See enclosed manuel



OPITEC  
Hobbyfix

## Nitinol Memory wire

This crystalline metal changes phase around 50°C. Bend it, then drop it into hot water and watch it return to its original shape! Can be set into different shapes by heating with a candle flame. (0.0297 inches diameter)

*Selected by Patrick Walravens  
For Science on stage Belgium  
Sponsored by SOLVAY, OPITEC and HOLLEEN*

