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Fortune Fish

SS-40

What is a Fortune Fish?

The Fortune Fish is a very thin piece of red cellophane in the shape of a fish, 8.9 cm (3.5 inch) long. When placed in the palm of your hand, the cellophane fish twists and curls. It moves differently for different people. In some instances, it may rock slightly; in other cases it curls up completely.

Classroom Ideas

1

Place a Fortune Fish in the hand of each student and observe. Ask students to brainstorm possible causes for the movements.

2

Moisten a small piece of paper towel, ca. 12 cm^2 (2 in^2), with two drops of water. Holding the Fortune Fish by the tail and horizontal, slowly lower the head over the moistened piece of towel, without ever touching the towel. What do you observe? What happens when you lower the Fortune Fish, held vertically?

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Classroom Ideas

3

Use a small piece of tape to fasten the tail of the fish to a table. Bring the moist paper towel close to its head. A Fortune Fish, which continuously moves up and down, can be called a Fortune Fish motor. Can you make one? What is the energy source for this motor? Can you find ways to increase the frequency of the up and down movement? How many repeating cycles can you observe without touching either the cellophane or the paper towel? Does the motor work better when the air is warmer or cooler? When covered with a large glass or not covered?

4

Out of sight of students, place two drops of water on a scrap of rug, ca 20 cm^2. Then ask students to find the location of the water by using the Fortune Fish as a moisture detector.

5

Discover other uses for the Fortune Fish.

What causes the Fortune Fish to move?

A common hypothesis is that heat causes the movement of the Fortune Fish. This is incorrect. To disprove this hypothesis, use tweezers to pick up your Fortune Fish by the tail, and then hold the cellophane over something warm—for instance, a light bulb. No movement should be observed.

When the Fortune Fish is placed on your palm, moisture is absorbed on one side of the cellophane, causing that side to expand. Since only one side is expanding, the thin cellophane curls as a result. When the water on the cellophane evaporates, the fish becomes flat.

Try placing your Fortune Fish onto a moist paper towel. The Fortune Fish motor absorbs water and curls upward. Away from the higher concentration of water vapor, the water molecules are released from the cellophane and the fish becomes flat.

For the Fortune Fish motor to work, there must be a difference in concentration of water vapor, so that water can be both absorbed and released. Slight circulation of air sometimes helps.

NGSS Correlations

Our Fortune Fish and these lesson ideas will support your students' understanding of these Next Generation Science Standards (NGSS):

Elementary

4-PS3-1
Students can use Fortune Fish as evidence to construct an explanation relating the speed of an object to the energy of that object.

4-PS3-2
Students can use Fortune Fish to make observations to provide evidence that energy can be transferred from place to place by heat.

4-PS3-4
Students can use Fortune Fish to apply scientific ideas to design, test, and refine a device that convert energy from one form to another.

Middle School

MS-PS3-1
MS-PS3-3
Students can use Fortune Fish to apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy.

MS-PS3-4
Students can use Fortune Fish to plan an investigation to determine that the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

High School

HS-PS3-3
Students can use Fortune Fish to design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Take Your Lesson Further

As science teachers ourselves, we know how much effort goes into preparing lessons. For us, "*Teachers Serving Teachers*" isn't just a slogan—it's our promise to you!

Please visit our website for more lesson ideas:

TeacherSource.com/lessons

Check our blog for classroom-tested teaching plans on dozens of topics:

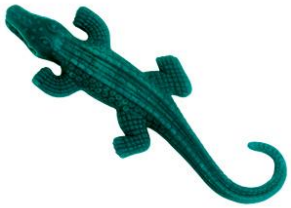
http://blog.TeacherSource.com

To extend your lesson, consider these Educational Innovations products:

Sodium Polyacrylate AKA "Diaper Polymer" (GB-6A)
This is the super-absorbent polymer found in disposable baby diapers. Also used in many 'disappearing water' magic tricks, this fine white powder instantly turns liquid water into a slush-like solid substance. Technically speaking, the polymer absorbs from 500 to 1,000 times its own weight in water. Simply add table salt to reverse the reaction. Safe and amazing—your students will love it!

Instant Snow Polymer (GB-300)
Add water to this granular white powder and watch it instantly expand to 40 times its original volume. The result is a fluffy artificial snow that feels as cool as it looks! Our snow won't 'melt' but it can be dehydrated and re-used. Great for teaching endothermic and exothermic reactions or as part of a polymer lab. This is a great demonstration of interest to students and educators of ALL ages and abilities.

Goldenrod Color-Changing Paper (SM-925)
True goldenrod paper is made from a dye which is an acid-base indicator. This paper turns bright red in bases such as ammonia, baking soda or washing soda and returns to bright yellow in acids such as vinegar or lemon juice. Make your own indicator paper or use to preserve fingerprints. Instructions included.



Large Gro-Beast Alligator (GB-202)
These growing alligators start at about 4 inches long (approx 10 cm) and grow to over a foot (approx. 30 cm) long when placed in water! These water absorbing polymers are great for a class measuring or graphing project or makes a super demonstration. Growth visible within 24 hours, full size in about a week!