

# FOCUS

# Wild Arizona

## Key Words

**Amphibian:** an animal that spends part of its life in water and part on land, such as a frog or salamander

**Bioindicator:** an animal that can be used to determine the health of an ecosystem

**Circumference:** the distance around a circle

**Membrane:** a thin covering or skin

**Model:** an object that represents another object in an experiment

**Permeable:** allowing water and other liquids to pass through

It's time to celebrate: 2008 is the Year of the Frog! Many zoos and other organizations around the world are using this year as a time to let people know how cool frogs and other **amphibians** are. And it comes just in time.

Around the world, frogs are in trouble. Many species are becoming endangered or going extinct. Although an exact cause is not known (and there may be more than one cause), it probably has something to do with their very special skin.

Frogs (and other amphibians) have **permeable** skin. This means water easily can penetrate the skin and enter the animal. Usually, this benefits frogs. It allows a frog's skin to pull oxygen

from the water almost the way gills do for fish. In addition, it allows them to absorb water from soil during droughts.

Unfortunately, there are problems. The frog also will absorb whatever is dissolved in the water. This can include pollutants such as pesticides and other chemicals. These toxins can build up in the frog until they reach a level high enough to kill the animal.

Let's test how permeable skin works.

## Do the science:

We don't want to test this on real animals, so we are going to use a **model**. In this case, our model is going to be a regular egg from the grocery store.

First, ask a parent for two hard-boiled eggs. Once the eggs have cooled, remove the hard, outer shell from ONE egg. You can do this by very carefully tapping the egg on the side of a bowl or countertop to crack it. Then, carefully peel off the shell. Underneath the shell is a thin, clear **membrane** or skin. (To remove the shell and keep this membrane in place, soak the egg in vinegar for a couple of days. The vinegar slowly will dissolve the shell.)

Write down some observations about both eggs. What do you see? What color is the egg? What does it feel like?

If possible, measure the **circumference** of each egg. (Can you figure out how to do this with a ruler and some string?)

Write down your measurements.

In a large bowl or cup, mix water with a few drops of food coloring. Then find two smaller cups. To each cup, add one of the eggs and enough of the colored water to cover the egg.

After at least one day, remove the eggs from the water. What do you notice? Write down some new observations.

Measure the circumference of each egg. What do you notice?



**By Eric Proctor**

Why do you think this happened?

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The cup of water represents a small pond and the food coloring represents a toxic chemical in the water. The eggs represent two different animals. One would be an amphibian (such as a frog) while the other would be a reptile with an impermeable skin (such as a snake).

Which egg do you think best represents an amphibian and which would represent another animal such as a snake?

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Have a parent gently cut each egg in half. What do you notice? Write down your observations.

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ILLUSTRATION BY TRACY HILL

Use a ruler to measure how far the food coloring moved into each egg.

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Frogs and other amphibians are often called **bioindicators**. These are animals that help us monitor the health of the environment. For example, if a group of animals starts to die off, it may indicate a problem, such as pollution, in the area. Based on the results of this simulation, describe why frogs are good bioindicators. ✎

■ This feature is part of the Arizona Game and Fish Department's Focus Wild Arizona program, a free educational program for teachers, parents, students or anyone interested in learning about wildlife and habitat. Visit our Web site, [www.azgfd.gov/focuswild](http://www.azgfd.gov/focuswild), to find exciting lessons and resources.