

STATION 2

Why does the bird drink? Is a change of state part of the process?



Station 2 - Answers to questions.

From <http://www.exploratorium.edu/snacks/dipping-bird>

The bird's head dips and gets wet.

Water evaporates from the fuzzy head.

The vapor in the bird's head condenses into liquid.

Pressure in the bird's head is reduced because the liquid takes up less space than the vapor.

Liquid moves up the tube into the low-pressure area in the head; the cycle repeats.

From <http://blog.teachersource.com/2009/12/01/the-amazing-drinking-bird/>:

The top bulb (head) of the drinking bird is covered with felt. After the felt is moistened with water and the water begins to evaporate, the temperature in the head decreases. This drop in temperature causes some of the vapor inside the head to condense, causing the pressure inside the birds head to decrease. The decrease in pressure in the top bulb causes the liquid from the bottom to be forced upward from the base. As the liquid flows into the top bulb, the bird's center of gravity moves upward causing the bird to tip forward, dipping its beak into the glass of water.

After the bird tips over and is horizontal, the bottom portion of the glass tube is no longer in the liquid. The glass tube, now 90 degrees to the surface allows the vapor from the bottom to travel to the top until the pressure is equalized. At the same time, liquid in the column flows back to the bottom bulb. The weight of the bird is now primarily below the pivot point, so the bird returns to a vertical position.

The liquid in the bottom bulb is now exposed to the temperature of the ambient air, which is slightly higher than that of the bird's head. This cycle continues as long as there is enough water in the glass to moisten the felt on the bird's head. This cycle gives the appearance of a bird drinking!

Images and Materials. Drinking birds are available from many sources including Educational Innovations.



Drinking birds and liquid crystal sheet for Station 3.

