

LET'S MAKE A THERMOMETER to observe temperature changes

Materials needed: a glass bottle with a cap, a jug of water; plasticine or hot glue, food coloring, a transparent drinking straw, a dropper, a funnel, a piece of white cardboard.

How to make it

Color the water in the jug with food coloring and fill the bottle to the brim using the funnel. The teacher or operator will have previously pierced the cap and inserted the transparent straw, sealing the edge well with plasticine or hot glue. The straw should protrude from the bottle by about 10 cm and should not touch the bottom of the bottle. Close the cap and use the dropper to add water through the straw, making sure that it rises about 3-5 cm up the straw. Place the white card behind the straw and mark the level reached by the water. This will be the reference temperature/level. To observe the temperature changes, immerse the bottle in a tray containing ice and then in hot water. The water level in the straw will vary accordingly due to the change in volume caused by the change in temperature. To better visualize the phenomenon, the water can initially be mixed with denatured alcohol (about half and half). In this case, to prevent the alcohol from evaporating quickly, add a few drops of oil to the straw when the water is at the reference level.

Water thermometer

Fill a small glass bottle with a wide mouth with sand. Insert the thermometer into the sand and close the bottle with the cap. Tie a string around the neck of the bottle. Immerse the thermometer in the water whose temperature you want to measure. Leave the thermometer immersed for a sufficiently long time so that the temperature of the air contained in the bottle is equal to that of the water in which it is immersed. If you are studying a river, lake, or sea and have the opportunity to take measurements from a pier, immerse the thermometer at different depths (measured by the length of the string) and in different seasons. In this case, it will be necessary to fill the bottle with water before immersing it, otherwise the presence of air will cause it to float. You will have to wait a certain amount of time for the temperature of the water inside the bottle to reach that of the river or sea outside. Record the data obtained and draw conclusions.

Further information

- the effects of ocean and sea warming on human health, the economy, and biodiversity.

