

A Science Service Feature

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? WHY THE WEATHER ?

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HOW WATER FREEZES

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When a body of water, such as a lake or a pond, cools with the approach of winter, the chilled surface water at first settles down, on account of its increased density, and is replaced by warmer and less dense water from below. This interchange tends to make the temperature of the water uniform throughout its depth, and if it continued until the freezing point was reached the entire body of water would freeze solid at the same time.

It ceases, however, when a temperature of four degrees Centigrade (39.2 degrees Fahrenheit) is reached, since water is densest at that temperature and expands with further cooling until it turns to ice. Thus at the surface, where loss of heat is generally most rapid, the water cools to the freezing point and becomes ice while the water below is above the freezing point and is still liquid.

Ordinarily, therefore, a body of water freezes first at the top. When, however, the water lies over frozen soil, or when the bottom loses heat rapidly by radiation on clear, calm nights, the bottom water may freeze first. Ice thus formed at the bottom is called "anchor-ice."

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