

TEMPERATURE

Unit 19 Dr. John P. Cise, Professor of Physics, Austin Com. College, Austin, Texas USA

jpcise@austincc.edu & New York Times , May 4, 2018 by Kendra Pierre-Louis, Dedicated to Smokey the Bear

As Winter Warms, Bears Can't Sleep. And They're Getting Into Trouble.

By Kendra Pierre-Louis

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INTRODUCTION: Temperature conversion (C to F) is not the same as converting changes in temperature (ΔC to ΔF & vice versa). This article is a good example of that point.

QUESTION: Show the calculations that 4.7 degree change Celsius is the same as 8.4 degrees Fahrenheit(as stated below)?

HINTS: $F^{\circ} = 9/5 C^{\circ} + 32$, but $\Delta F/\Delta C = 9/5$

ANSWERS: show calculation please

CreditPhoto Illustration by Claire O'Neill/The New York Times

GENOA, Nev. — There are certain axioms about the natural world we learn as children. The sea is salty. Plants grow toward light. Bears hibernate in winter. But as climate change leads to warmer winters, later falls and earlier springs — which can disrupt both food supplies and biological rhythms — American black bears are changing their hibernation routines, scientists say. In some cases, bears are not hibernating at all, staying awake all winter. In others, bears are waking from their slumber too early. For every one degree Celsius that minimum temperatures increase in winter, bears hibernate for six fewer days, [a study found last fall](#). As global temperatures continue to rise, **by the middle of the century black bears may stay awake between 15 and 39 more days per year**, the study said. A February visit to the Pine Nut Mountains of northwestern Nevada, near Lake Tahoe, provided a preview of what could lie ahead. **The previous fall, regional temperatures were(((as much as 4.7 degrees Celsius (8.4 degrees Fahrenheit) warmer))) than the 20th century average.** In January temperatures were 5.4 degrees Celsius warmer. Ordinarily Rae Wynn-Grant, a large-carnivore ecologist based at the American Museum of Natural History, would be spying on Pine Nut's sleeping bears to better understand how they choose where to hibernate. But when she checked GPS signals from two bears that had been collared by the Nevada Department of Wildlife, the bears were moving — they were awake. That meant it was too dangerous to try to observe them up close. So on this outing Dr. Wynn-Grant was looking for sites where bears could have hibernated if they had gone to bed. "Over the years we've had reports of bears hibernating under people's decks and in their garages and stuff, so we would have to wake them up in order to get them out," Dr. Wynn-Grant said. "But until this year, I had never known about awake bears." Warmer winters deprive bears of a key signal they need to hibernate: cold weather. In a temperate climate, bears usually hibernate during winter when food is scarce, said Heather Johnson, a research wildlife biologist with the United States Geological Survey and an author of the hibernation study published last fall.