

THE STRAIGHT DOPE®

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On the Fahrenheit scale, why is 32 freezing and 212 boiling? What do 0 and 100 mean?

Dear Cecil:

Everybody knows 0 degrees on the Celsius scale is the freezing point of water and 100 degrees is the boiling point. On the Fahrenheit scale, however, freezing is 32 degrees and boiling 212.

How on earth were these numbers arrived at? Do 0 and 100 degrees Fahrenheit mean anything? --Leslie, Montreal, Quebec

Cecil replies:

Researchers have gone to their graves trying to figure out what old man Fahrenheit was up to, Leslie. Here's the story as well as I can piece it together:

Daniel Gabriel Fahrenheit (1686-1736) was a German instrument maker who invented the first practical mercury thermometer. Casting about for a suitable scale for his device, he visited the Danish astronomer Ole Romer, who had devised a system of his own.

As it turned out, it was a case of the blind leading the blind.

Romer had decided that the boiling point of water should be 60 degrees. This at least had the strength of numerological tradition behind it (60 minutes in an hour, right?).

But zero was totally arbitrary, the main consideration apparently being that it should be colder than it ever got in Denmark. (Romer didn't like using negative numbers in his weather logbook.)

In addition to the boiling point of water, the landmarks on Romer's scale were the freezing point of water, 7-1/2 degrees, and body temperature, 22-1/2 degrees.

D.G., simple soul that he was, thought this cockeyed system was the soul of elegance. He made one useful change: to get rid of the fractions, he multiplied Romer's degrees by 4, giving him 30 for the freezing point and 90 for body temperature.

Then, for reasons nobody has ever been able to fathom, he multiplied all the numbers by 16/15, making 32 freezing and 96 body temperature. Boiling point for the time being he ignored altogether.

By and by Fahrenheit got ready to present his scale to London's Royal Society, the scientific big leagues of the day.

It dawned on him that it was going to look a little strange having the zero on his scale just sort of hanging off the end, so to speak. So he cooked up the explanation that zero was the temperature of a mix of ice, water, and ammonium chloride.

The Straight Dope: On the Fahrenheit scale, why is 32 freezing and 212 boiling? What do 0 and 100 mean?

At some point Fahrenheit figured out that the boiling point of water came in at 212 degrees. Over time this replaced body temp as the upper landmark on his scale. Meanwhile, as more precise measurements were made, body temperature had to be adjusted to 98.6 degrees.

In short, 100 means nothing at all on the Fahrenheit scale, 96 used to mean something but doesn't anymore, and 0 is colder than it ever gets in Denmark. Brilliant.

Lest we get too down on Fahrenheit, though, consider Anders Celsius, who devised the centigrade scale (0 to 100).

Everybody agrees Celsius's scale makes more sense than Fahrenheit's. Trouble is, the original Celsius scale had 100 for freezing, 0 for boiling. In other words, it was upside-down. (The numbers were reversed after Celsius's death.)

These thermometer guys, what gets into them? Must be too much mercury exposure.

OK, you're saying, very interesting. But what I REALLY need is a temperature trivia question that will make me the life of the party.

I have just the thing. At what temperature are the Fahrenheit and Celsius readings the same? People will look at you with newfound respect when you reveal the astonishing answer: minus 40.

--CECIL ADAMS

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