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Fahrenheit and Celsius are the same at -40°.What temperature are Fahrenheit and Celsius equal? The temperature is -40°. It’s a very cold temperature that’s low enough it instantly freezes boiling water into snow!But, how do you know the temperature where the two scales are the same? This is a common homework question for students when they are learning unit conversions. This example problem shows how to calculate when the reading on a Celsius thermometer would equal the reading on on a Fahrenheit thermometer.Start with one of the two conversion factors between °C and °F.The two conversion formulas are:°C = 5⁄9(°F – 32)and°F = 9⁄5°C + 32It doesn’t matter which one you use since they are two forms of the same equation. Let’s use the second one. We want to know when °C = °F, so the equation becomes:°C = 9⁄5°C + 32Solve for °C°C – 9⁄5°C = 32Factor out the °C(1 – 9⁄5)°C = 32Solve the fraction(5⁄5 – 9⁄5)°C = 32–4⁄5°C = 32Multiply both sides by 5-4°C = 160Divide both sides by -4°C = -40°C = °F = -40.Celsius equals Fahrenheit at -40°. You use the same method to find the point at which other temperature scales are equal, too.For more help, try these other temperature conversion example problems:Convert Celsius to Fahrenheit Example ProblemConvert Fahrenheit to Celsius Example ProblemConvert Celsius to Kelvin Example ProblemConvert Kelvin to Celsius Example ProblemWhat Temperature Are Fahrenheit and Kelvin Equal?Related Posts Fahrenheit is a temperature scale named after the German-Dutch physicist Daniel Gabriel Fahrenheit (1686–1736), who proposed it in 1724. In this scale, the freezing point of water is 32 degrees Fahrenheit (written “32 °F”), and the boiling point is 212 degrees, placing the boiling and freezing points of water exactly 180 degrees apart. Celsius is, or relates to, the Celsius temperature scale (previously known as the centigrade scale). The degree Celsius (symbol: °C) can refer to a specific temperature on the Celsius scale as well as serve as unit increment to indicate a temperature interval(a difference between two temperatures or an uncertainty). “Celsius” is named after the Swedish astronomer Anders Celsius (1701-1744), who developed a similar temperature scale two years before his death. Until 1954, 0 °C on the Celsius scale was defined as the melting point of ice and 100 °C was defined as the boiling point of water under a pressure of one standard atmosphere; this close equivalence is taught in schools today. However, the unit “degree Celsius” and the Celsius scale are currently, by international agreement, defined by two different points: absolute zero, and the triple point of specially prepared water. This definition also precisely relates the Celsius scale to the Kelvin scale, which is the SI base unit of temperature (symbol: K). Absolute zero—the temperature at which nothing could be colder and no heat energy remains in a substance—is defined as being precisely 0 K and −273.15 °C. The triple point of water is defined as being precisely 273.16 K and 0.01 °C. On the Celsius scale, the freezing and boiling points of water are exactly 100 degrees apart, thus the unit of the Fahrenheit scale, a degree Fahrenheit, is 5/9 of a degree Celsius. The Fahrenheit scale coincides with the Celsius scale at -40 °F, which is the same temperature as -40 °C. Comparing the scales This picture compares Celsius and Fahrenheit scales on a thermometer. Celsius and Fahrenheit thermometers side by side compare the two scales. The freezing point of water is 0 Celsius or 32 degrees Fahrenheit. The boiling point of water is 100 Celsius or 212 degrees Fahrenheit. Differences in Usage In the United States the Fahrenheit system continues to be the accepted standard for non-scientific use. All other countries have adopted Celsius as the primary scale in use. Fahrenheit is sometimes used by older generations in English speaking countries, especially for measurement of higher temperatures. The United Kingdom has almost exclusively used the Celsius scale since the 1970s, with the notable exception that some broadcasters and publications still quote Fahrenheit air temperatures occasionally in weather forecasts, for the benefit of generations born before about 1950, and air-temperature thermometers sold still show both scales for the same reason. The Fahrenheit scale was the primary temperature standard for climatic, industrial and medical purposes in most English-speaking countries until the 1960s. In the late 1960s and 1970s, the Celsius (formerly Centigrade) scale was phased in by governments as part of the standardizing process of metrication. Fahrenheit supporters assert its previous popularity was due to Fahrenheit’s user-friendliness. The unit of measure, being only 5⁄9 the size of the Celsius degree, permits more precise communication of measurements without resorting to fractional degrees. Also, the ambient air temperature in most inhabited regions of the world tends not to go far beyond the range of 0 °F to 100 °F: therefore, the Fahrenheit scale would reflect the perceived ambient temperatures, following 10-degree bands that emerge in the Fahrenheit system. Also, coincidentally, the smallest sensible temperature change averages one Fahrenheit degree; that is, the average person can just detect a temperature difference of a single degree. But some Celsius supporters argue that their system can be just as natural; for example, they might say that 0–10 °C indicates cold, 10–20 °C mild, 20–30 °C warm and 30–40 °C hot. History Relationship with the Kelvin scale K = (°F + 459.67) ÷ 1.8 °F = (K × 9/5) − 459.67 K = °C + 273.15 °C = K − 273.15 Unicode representation The Fahrenheit symbol has its own Unicode character: U+2109 (decimal value 8457). The character entity ℉ or ℉ can be used on Web page, yielding ℉ rather than °F as two separate characters. The Unicode character for “℃” is U+2103 (decimal value 8451). One types ℃ (or ℃) when encoding this special character in a Web page. Its appearance is similar to the one synthesized by individually typing its two components (°) and (C). References Share this comparison via: If you read this far, you should follow us: "Celsius vs Fahrenheit." Diffen.com. Diffen LLC, n.d. Web. 9 Jul 2025. < > At what temperature are Celsius and Fahrenheit the same? The formulas for converting between degree Celsius and degree Fahrenheit are: °F = (°C * 9/5) + 32 °C = (°F - 32) * 5/9 To find the temperature when both are equal, we use an old algebra trick and just set ºF = ºC and solve one of the equations. °C = (°C * 9/5) + 32 °C - (°C * 9/5) = 32 -4/5 * °C = 32 °C = -32 * 5/4 °C = -40 °F = (°F * 9/5) + 32 °F - (°F * 9/5) = 32 -4/5 * °F = 32 °F = -32 * 5/4 °F = -40 So the temperature when both the Celsius and Fahrenheit scales are the same is -40 degrees. » Return to the FAQ Temperature scales (or thermometric scales) are the scales used to determine the temperature of a body by measuring it in degrees. A temperature scale is a method of expressing the physical quantity temperature in a number.Temperature is a scalar quantity that measures the amount of thermal energy that a body has.There are two types of temperature scales:Empirical scales. These scales are based on the measurement of physical parameters, usually a simple linear, functional relationship.Thermodynamic scales. These scales are absolute and are based on the fundamental laws of thermodynamics or statistical mechanics.There are several temperature scales of which the most important are:1. Kelvin scaleThe Kelvin scale is a centigrade scale to measure thermodynamic temperature whose unit of measurement is the kelvin. The kelvin is the base unit of temperature in the International System of Units (SI) and has the unit symbol K.By convention, the zero of the Kelvin scale (absolute zero) corresponds to a temperature of -273.16 ° C. This value is the lowest possible temperature at which, in theory, there is no type of movement between the particles that make up matter.The melting temperature of ice (corresponding to 273.16 K) and the boiling temperature of water (corresponding to 373.16 K) are taken as references on the Kelvin scale.The interval between these two temperatures (373.16 K and 273.16 K) is divided into 100 equal parts, each of which is called Kelvin (and not degrees Kelvin). The Kelvin scale is the temperature scale used in the International System.The absolute temperature scale is based on the (p, V, T) relationships for an ideal gas as given by equation (1.7)PV=nRTT is the absolute temperature, P, V, and n are the pressure, volume, and the number of moles as described, and R is the gas constant.2. Celsius scaleThe Celsius scale was proposed in 1742 by the Swedish astronomer Anders Celsius.On the Celsius scale, the freezing point of water corresponds to 0 ° C, while the boiling temperature of water corresponds to 100 degrees Celsius in a standard atmosphere. Both temperatures are determined at atmospheric pressure.The interval between these freezing and boiling points (100 ° C and 0 ° C) is divided into 100 equal parts, called degrees Celsius or degrees centigrade. The Celsius scale is the temperature scale used in Europe.One degree Celsius is equivalent to one kelvin.The Celsius temperature scale has replaced the old Fahrenheit in Europe and most of the world. In thermodynamics, the absolute temperature scale is mainly used.Since 1743 the Celsius scale has been based on 0 degrees Celsius for the freezing point of water and 100 degrees Celsius for the boiling point of water. Before 1743, the values were reversed.3. Fahrenheit scaleThe Fahrenheit scale is a temperature scale proposed by the German physicist and engineer Daniel Gabriel Fahrenheit in 1724.On the Fahrenheit temperature scale, the melting temperature of ice (which corresponds to 32 ° F) and the boiling point of water (which corresponds to 212 ° F) are taken as references.The interval between these two temperatures (212 ° F and 32 ° F) is divided into 180 parts, known as degrees Fahrenheit. The Fahrenheit scale is the thermometric scale used in the United States and Anglo-Saxon countries.4. Rankine scaleThe Rankin temperature scale is a scale for measuring temperatures proposed in 1859 by the Scottish engineer and physicist William John Macquorn Rankine.° R. usually denotes the degree on this scale, Although it coincides with the notation for the degree of the Réaumur scale.Like the Kelvin temperature scale, the Rankin scale is absolute; zero-degree is the absolute zero temperature. Unlike Kelvin, which took the Celsius size of the interval (100 ° between the melting point of ice and the boiling point of water at normal atmospheric pressure), Rankine took the magnitude of the degree Fahrenheit (180 ° between the melting point of ice and boiling point of water at normal atmospheric pressure).Disused temperature scalesAdditionally to these four temperature scales, there are other disused temperature scales:Réaumur scale Degree Réaumur (ºRé), in disuse. It is due to Rene-Antoine Ferchault de Réaumur (1680-1757). The relationship with the Celsius scale is:T (ºRé) = (4/5) * t (° C) or t (° C) = (5/4) * T (ºRé)T (ºRé) = (4/5) * [T (K) - 273, 16] or T (K) = (5/4) * T (ºRé) + 273, 16where T (ºRé) is the temperature expressed in degrees Réaumur.Rømer scale The unit of measurement on this scale (ºRø) is equivalent to 40/21 of a Kelvin (or one degree Celsius). The symbol for degree Rømer is ºRø.T (ºRø) = (21/40) * t (° C) + 7.5 or t (° C) = (40/21) * [T (ºRø) - 7.5]T (ºRø) = (21/40) * [T (K) - 273, 16] + 7, 5 or T (K) = (40/21) * [T (ºRø) - 7, 5] + 273, 16where T (ºRø) is the temperature expressed in degrees Rømer.Delisle scale It was created by the French astronomer Joseph-Nicolas Delisle. Its units are degrees Delisle (or De Lisle), the symbol ºDe represents them, and each one is worth -2/3 of a degree Celsius or Kelvin. The zero of the scale is at the water’s boiling temperature, and it increases as the other scales descend until it reaches absolute zero at 559.725ºDe.Newton scale T (ºN) = (33/100) * t (° C) or t (° C) = (100/33) * T (ºN)T (ºN) = (33/100) * T (K) - 273, 16 or T (K) = (100/33) * T (ºN) + 273, 16where T (ºN) is the temperature expressed in degrees Newton.Leiden scale Leiden degree (ºL) was used to calibrate indirectly low temperatures. Currently in disuse.Author: Oriol Planas - Technical Industrial EngineerPublication Date: June 8, 2021Last Revision: June 8, 2021 AnswerVerifiedHint: There are several well-defined scales of measurement of temperature in different units. These scale values can be interconverted into one another. For finding the temperature where Celsius and Fahrenheit scales show the same reading but with opposite signs, we will use the conversion equation from Fahrenheit to Celsius scale.Complete step by step answer:The degree Celsius is a unit of measuring temperature on the Celsius scale. Celsius scale is a temperature scale, called a centigrade scale. The degree Celsius, represented as$^{\text{o}}\text{C}$, refers to a particular temperature on the Celsius scale or a unit to specify the difference between two temperatures. Fahrenheit is a temperature scale that specifies the boiling point of water at ${{212}^{\text{o}}}\text{F}$and the freezing point of water at${{32}^{\text{o}}}\text{F}$. It uses the degree Fahrenheit, represented as$^{\text{o}}\text{F}$, as its measuring unit to indicate a specific temperature as well as to denote the difference between two temperatures. Zero degrees Celsius is defined as $273.15K$. One degree Celsius, centigrade temperature, is equal to one Kelvin; therefore, boiling point of water is equal to$273.15+100=373.15\text{ Kelvin}$. The Fahrenheit temperature range is based on setting the freezing point of water at32 degrees, and boiling point to212 degrees. This means that boiling and freezing points are 180 degreesapart. Absolute zero is defined as $-459.67{{\text{ }}^{\text{o}}}\text{F}$Celsius to Fahrenheit scale:\[^{\text{o}}\text{F=}\left(\dfrac{\text{9}}{\text{5}} \right){{\times }^{\text{o}}}\text{C+32}\]We have to calculate that value of temperature, where Celsius and Fahrenheit scales show the same reading but with opposite sign,It means,$^{\text{o}}\text{F = }{{\text{-}}^{\text{o}}}\text{C}$We will use the algebraic equation to determine the valuePut $^{\text{o}}\text{F = }-{{\text{ }}^{\text{o}}}\text{C}$in conversion equation,\[\begin{align} & -{{\text{ }}^{\text{o}}}\text{C =}{{\text{ }}^{\text{o}}}\text{C }\!\!\times\!\!\text{ }\left(\dfrac{\text{9}}{\text{5}} \right)\text{+32} \\ & -{{\text{ }}^{\text{o}}}\text{C}-{{\text{ }}^{\text{o}}}\text{C}\left(\dfrac{\text{9}}{\text{5}} \right)\text{ = 32} \\ & -\left(\dfrac{\text{14}}{\text{5}} \right){{\text{ }}\!\!\times\!\!\text{ }}^{\text{o}}}\text{C = 32} \\ & ^{\text{o}}\text{C =}-\dfrac{\text{80}}{\text{7}} \\ \end{align}\]\[\left| ^{\text{o}}\text{C} \right|\text{ = }\left| ^{\text{o}}\text{F} \right|\text{ = 11}\text{.44}\]The value where the Celsius and Fahrenheit scales coincide but with opposite sign is 11.44Hence, the correct option is A. Note: Celsius scale, or centigrade scale, is a temperature scale that is based on the freezing point of water at ${{\text{0}}^{\text{o}}}\text{C}$and the boiling point of water at$\text{10}{{\text{0}}^{\text{o}}}\text{C}$. Fahrenheit scale is a temperature scale that is based on the freezing point of water at $\text{3}{{\text{2}}^{\text{o}}}\text{F}$and the boiling point of water at$\text{21}{{\text{2}}^{\text{o}}}\text{F}$. AnswerVerifiedHint :Celsius, Fahrenheit, and Kelvin are the three main temperature scales. Temperature conversion equations can be used to convert temperatures from one scale to another. At a single pressure and temperature known as the triple point, the three phases of water (ice, liquid water, and water vapor) can coexist.Complete Step By Step Answer:Celsius: The degree Celsius is a temperature unit on the Celsius scale, which was originally known as the centigrade scale. The degree Celsius (symbol: $ {}^\circ C $) can refer to a specific temperature on the Celsius scale or a unit used to indicate a difference or range of temperatures. It is named after the Swedish astronomer Anders Celsius ($ 1701 $ – $ 1744 $), who invented a similar temperature scale.Fahrenheit: The Fahrenheit scale is a temperature scale based on one proposed by physicist Daniel Gabriel Fahrenheit ($ 1686 $ – $ 1736 $) in $ 1724 $. The unit is the degree Fahrenheit (symbol: $ {}^\circ F $). There are several accounts of how he first defined his scale, but the original paper suggests that the lower defining point, $ 0\text{ }{}^\circ F $, was established as the freezing temperature of a brine solution made from a mixture of water, ice, and ammonium chloride (a salt)The formulas for converting between degree Celsius and degree Fahrenheit are: $ {}^\circ F=({}^\circ C\times \dfrac{9}{5})+32 $ $ {}^\circ C=({}^\circ F-32)\times \dfrac{5}{9} $ Thus, We have $ {}^\circ C=({}^\circ C\times \dfrac{9}{5})+32 $ $ \Rightarrow $ $ {}^\circ C-({}^\circ C\times \dfrac{9}{5})=32 $ $ \Rightarrow $ $ \dfrac{-4}{5}\times {}^\circ C=32 $ $ \Rightarrow $ $ {}^\circ C=-32\times \dfrac{5}{4} $ $ \Rightarrow $ $ {}^\circ C=-40 $ Similarly, $ \Rightarrow $ $ {}^\circ F=({}^\circ F\times \dfrac{9}{5})+32 $ $ \Rightarrow $ $ {}^\circ F-({}^\circ F\times \dfrac{9}{5})=32 $ $ \Rightarrow $ $ \dfrac{-4}{5}\times {}^\circ F=32 $ $ \Rightarrow $ $ {}^\circ F=-32\times \dfrac{5}{4} $ $ \Rightarrow $ $ {}^\circ F=-40 $ The temperature scales Celsius and Fahrenheit are both important. The Celsius scale is used all over the world, whereas the Fahrenheit scale is primarily used in the United States. Temperatures in degrees are equal at one point on the Fahrenheit and Celsius scales. This is equivalent to $ -40\text{ }{}^\circ C $ or $ -40\text{ }{}^\circ F $ .Note :Temperature is measured by thermometers using well-defined scales. Fahrenheit, Celsius, and Kelvin are the three most common temperature scales. Identifying two reproducible temperatures yields temperature scales. Water freezing and boiling temperatures at standard atmospheric pressure are frequently used. Celsius and Fahrenheit are two important temperature scales. The Fahrenheit scale is used primarily in the United States, while Celsius is used throughout the world. The two scales have different zero points, and the Celsius degree is bigger than the Fahrenheit. However, there is one point on the Fahrenheit and Celsius scales where the temperatures in degrees are equal. This is -40 °C and -40 °F. If you can't remember the number, there is a simple algebraic method to find the answer. Celsius and Fahrenheit are two temperature scales.The Fahrenheit and Celsius scales have one point at which they intersect. They are equal at -40 °C and -40 °F.The simple method to find when two temperature scales are equal to each other is to set the conversion factors for the two scales equal to each other and solve for temperature. Rather than converting Fahrenheit to Celsius (which is not helpful because it assumes you already know the answer), you can set degrees Celsius and degrees Fahrenheit equal to each other using the conversion formula between the two scales: °F = (°C * 9/5) + 32°C = (°F - 32) * 5/9 It does not matter which equation you use; simply use x instead of degrees Celsius and Fahrenheit. You can solve this problem by solving for x: °C = 5/9 * (°F - 32)x = 5/9 * (x - 32)x = (5/9)x - 17.7781x - (5/9)x = -17.7780.444x = -17.778x = -40 degrees Celsius or Fahrenheit Working using the other equation, you get the same answer: °F = (°C * 9/5) + 32°x - (°x * 9/5) = 32-4/5 * °x = 32°x = -32 * 5/4x = -40° You can set two scales equal to each other to find when any of them intersect. Sometimes it's easier to just look up the equivalent temperature. This handy temperature conversion scale may help you out. You can also practice converting between temperature scales: Fahrenheit to Celsius Celsius to Fahrenheit Celsius vs Centigrade

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