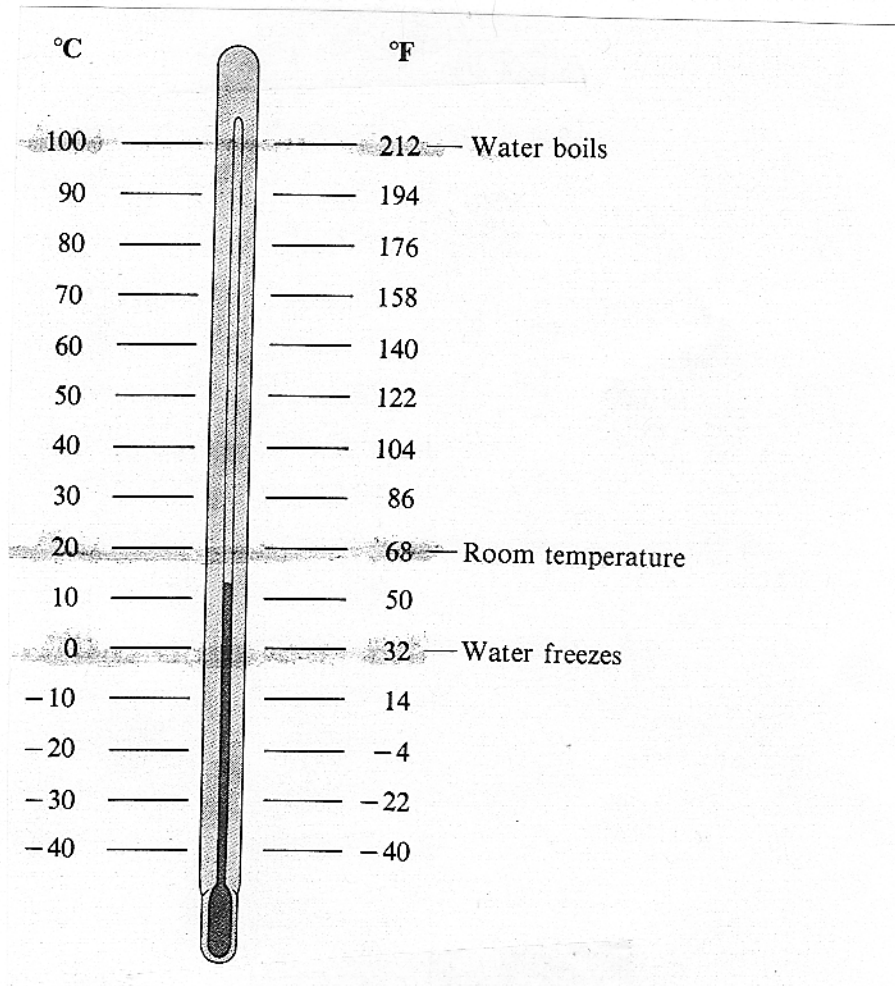


## Converting Temperature (Fahrenheit to Celsius, Celsius to Fahrenheit)

The Fahrenheit scale is the most common temperature scale used in the United States. We are most familiar with Fahrenheit temperatures associated with the air, freezer, and oven temperatures. In Tucson, we are used to air temperatures of 90° - 100° F. We bake a pizza or cookies, we usually set the oven at about 400°F.

The Celsius scale is most often used outside of the United States and is the temperature scale that most scientists use. An air temperature of 95°F is equivalent to 35°C. An oven temperature of 400°F is equivalent to 204°C. The figure below compares Celsius temperatures and the corresponding Fahrenheit temperatures.

There are a few key temperatures to note with respect to hydrology, as shown in this figure. At standard pressure, water freezes at 32°F or 0°C and water boils at 212°F or 100°C.



There is a direct relationship between the two temperature scales. The formulas below show you how to convert from one temperature scale to the other.

**A. To convert Fahrenheit to Celsius, use:**

$$^{\circ}\text{C} = \frac{5}{9}(^{\circ}\text{F} - 32)$$

**B. To convert Celsius to Fahrenheit, use:**

$$^{\circ}\text{F} = \frac{9}{5}(^{\circ}\text{C}) + 32$$

---

***Be very careful with your calculations!***  
***Details on how to do this:***

---

**A. To convert Fahrenheit to Celsius:**

1. Subtract 32 from the Fahrenheit temperature
2. Multiply that answer by 5
3. Divide that answer by 9

**B. To convert Celsius to Fahrenheit, use:**

1. Multiply the Celsius temperature by 9
2. Divide the answer by 5
3. Add 32

***Examples:***

***EXAMPLE 1: How many degrees Celsius is 15° F ?***

Since you want Celsius, use Formula A.

$$^{\circ}\text{C} = \frac{5}{9}(^{\circ}\text{F} - 32) \quad \text{Plug in 15 in place of } ^{\circ}\text{F}$$

$$^{\circ}\text{C} = \frac{5}{9}(15 - 32) \quad \text{Subtract 32 from 15.}$$

Yes, this gives you a negative number in this case (-17).

$$^{\circ}\text{C} = \frac{5}{9}(-17) \quad \text{Multiply -17 times 5, which equals -85}$$

$$^{\circ}\text{C} = \frac{-85}{9} \quad \text{Divide that answer (-85) by 9.}$$

$$^{\circ}\text{C} = -9.44^{\circ}\text{C}$$

**EXAMPLE 2: How many degrees Fahrenheit is 60° C ?**

Since you want Fahrenheit, use Formula B.

$$^{\circ}F = \frac{9}{5}(^{\circ}C) + 32$$

Plug in 60 in place of °C.

$$^{\circ}F = \frac{9}{5}(60) + 32$$

Multiply 60 times 9, which equals 540.

$$^{\circ}F = \frac{540}{5} + 32$$

Divide the answer, 540, by 5, which equals 108.

$$^{\circ}F = 108 + 32$$

Take the answer and add 32.

$$^{\circ}F = 140^{\circ} F$$