Curriculum Outcome

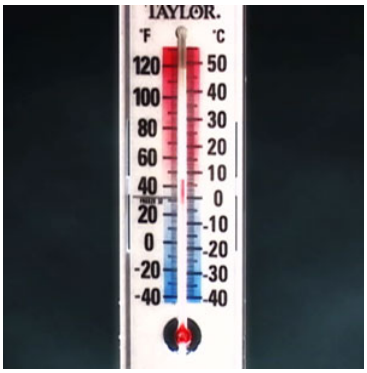
M1 Demonstrate an understanding of the Système International (SI) by describing the relationships of the units for length, area, volume, capacity, mass and temperature.

M2 Demonstrate an understanding of the Imperial system by: describing the relationships of the units for length, area, volume, capacity, mass and temperature.

Student Friendly: The relationship between degrees Celsius and degrees Fahrenheit

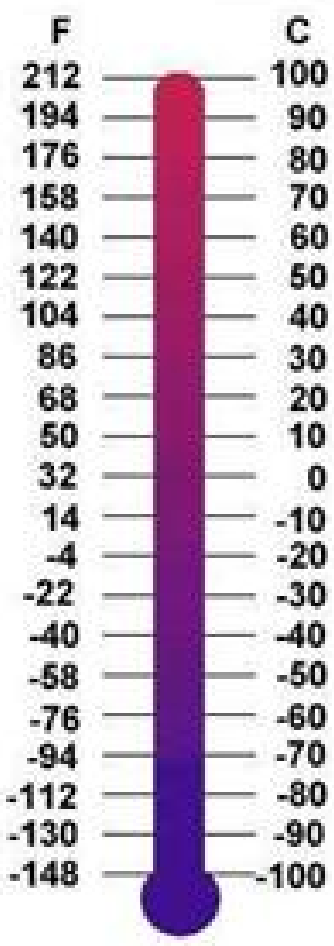
Chapter 5: Mass, Temperature, and Volume

We will look at further conversions between the metric and imperial systems in this chapter and learn how to apply them to real life situations.



Temperature

Have you ever noticed how cooking temperatures for most frozen meals are given in °F yet we measure the outside temperature in °C? How do we compare the temperatures in these two systems of measurement?



Boiling point of water

Average body Temp. 37C (98.6F)

Freezing (melting) point of water

Converting Fahrenheit to Celsius

F → C

* Do brackets first!

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

or $C = \frac{5(F - 32)}{9}$

Convert -4°F to degrees Celsius.

$$C = 5/9\,(F - 32)$$

$$= \frac{5(-4 - 32)}{9}$$

$$= \frac{5(-36)}{9}$$

$$= \frac{-180}{9} = -20\,^{\circ}C$$

Convert 78°F to degrees Celsius.

$$C = 5/9\,(F - 32)$$

$\frac{5}{9}(78-32) = \frac{5\,(78-32)}{9}$

$= \frac{5\,(46)}{9}$

$= \frac{230}{9} = 25.6\,^{\circ}C$

Converting Celsius to Fahrenheit

C ⟶ F

* Multiply the "C" by 9 then ÷ by 5, then add 32 last

$$F = \frac{9}{5}C + 32$$

$$F = \frac{9C}{5} + 32$$

Convert 58°C to degrees Fahrenheit.

$$F = 9/5\,C + 32$$

$$= \frac{9(58)}{5} + 32$$

$$= \frac{522}{5} + 32$$

$$= 104.4 + 32$$

$$= 136.4\,^{\circ}F$$

Convert 14°C to degrees Fahrenheit.

$$F = 9/5\ C + 32$$

$$\frac{9}{5}(14) + 32$$

$$57.2°F$$

While travelling in the US, Jennifer and Richard are concerned because their daughter Isabella has a temperature of 39°C, so they take her to a medical clinic. The nurse takes Isabella's temperature on the Fahrenheit scale. What will Isabella's temperature be in degress Fahrenheit?

The average normal body temperature is generally accepted as 98.6°F (37°C).

$$F = \frac{9C}{5} + 32$$

$$F = \frac{9(39)}{5} + 32$$

$$= 70.2 + 32$$

$$102.2$$

$$= 102.2\ ^\circ F$$

Try some of these:

Temperature Conversions 4.1

1) Convert following temperature to degree Fahrenheit

a. 35 °C b) – 8°C c) 165°C d) 21°C e. -40°C

2) Convert the following temperature to degrees Celsius

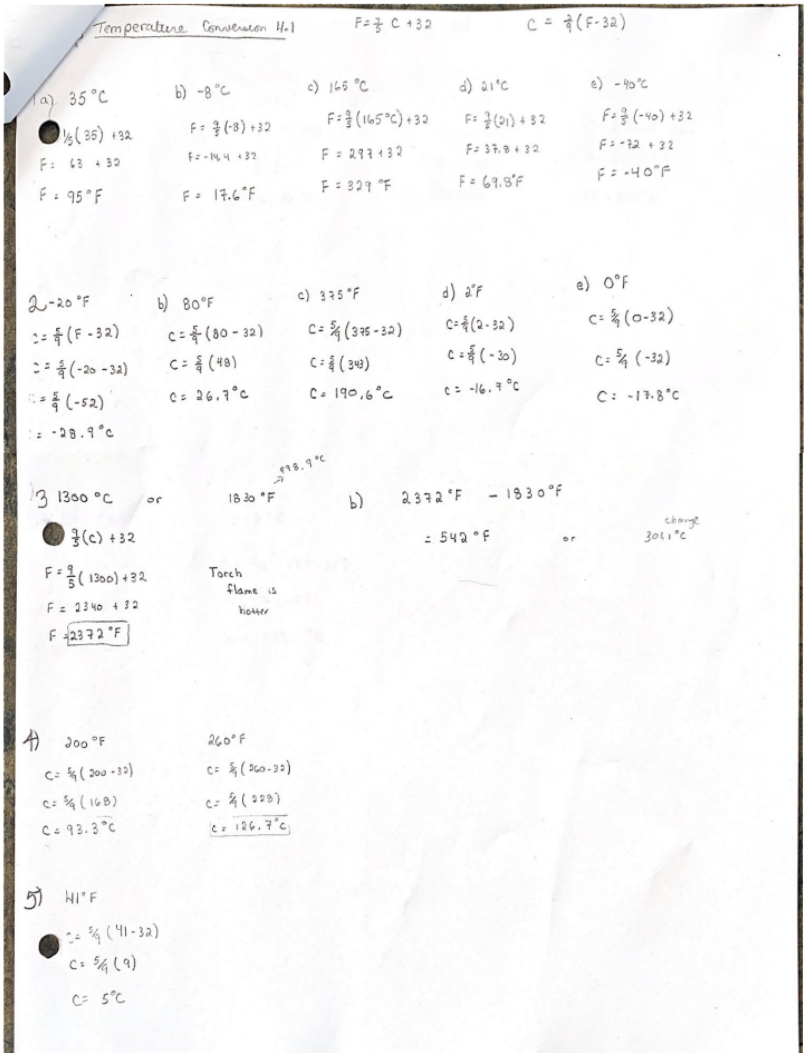
a. -20°F b) 80°F c) 375°F d) 2°F e. 0°F

3) Which is hotter, a blow torch flame at 1300°C or a candle flam at 1830°F? By how much hotter is the flame than the other.

4) When Harry mixes different materials to pave a road, he knows that they must be kept at the following temperatures in degrees Fahrenheit. Calculate the tempera

a. Bituminous material must be between 200°F and 260°F

5) When the human body reaches a temperature of 41°F, it is said to be in a state of "medical emergency". What is this temperature in degrees Celsius?



Temperature Conversion #1 $F = \frac{9}{5}C + 32$ $C = \frac{5}{9}(F - 32)$

a) 35 °C
$\frac{9}{5}(35) + 32$
$F = 63 + 32$
$F = 95\,°F$

b) −8 °C
$F = \frac{9}{5}(-8) + 32$
$F = -14.4 + 32$
$F = 17.6\,°F$

c) 165 °C
$F = \frac{9}{5}(165\,°C) + 32$
$F = 297 + 32$
$F = 329\,°F$

d) 21 °C
$F = \frac{9}{5}(21) + 32$
$F = 37.8 + 32$
$F = 69.8\,°F$

e) −40 °C
$F = \frac{9}{5}(-40) + 32$
$F = -72 + 32$
$F = -40\,°F$

2) −20 °F
$C = \frac{5}{9}(F - 32)$
$C = \frac{5}{9}(-20 - 32)$
$C = \frac{5}{9}(-52)$
$C = -28.9\,°C$

b) 80 °F
$C = \frac{5}{9}(80 - 32)$
$C = \frac{5}{9}(48)$
$C = 26.7\,°C$

c) 375 °F
$C = \frac{5}{9}(375 - 32)$
$C = \frac{5}{9}(343)$
$C = 190.6\,°C$

d) 2 °F
$C = \frac{5}{9}(2 - 32)$
$C = \frac{5}{9}(-30)$
$C = -16.7\,°C$

e) 0 °F
$C = \frac{5}{9}(0 - 32)$
$C = \frac{5}{9}(-32)$
$C = -17.8\,°C$

3) 1300 °C or 1830 °F → 998.9 °C
$\frac{9}{5}(C) + 32$
$F = \frac{9}{5}(1300) + 32$
$F = 2340 + 32$
$F = 2372\,°F$

Torch flame is hotter

b) 2372 °F − 1830 °F
$= 542\,°F$ or change $301.1\,°C$

4) 200 °F
$C = \frac{5}{9}(200 - 32)$
$C = \frac{5}{9}(168)$
$C = 93.3\,°C$

260 °F
$C = \frac{5}{9}(260 - 32)$
$C = \frac{5}{9}(228)$
$C = 126.7\,°C$

5) 41 °F
$C = \frac{5}{9}(41 - 32)$
$C = \frac{5}{9}(9)$
$C = 5\,°C$

Attachments

Worksheet - EXTRA Practice Converting Temperatures.docx

5.1 Worksheet - Temperature Conversions.docx