

**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

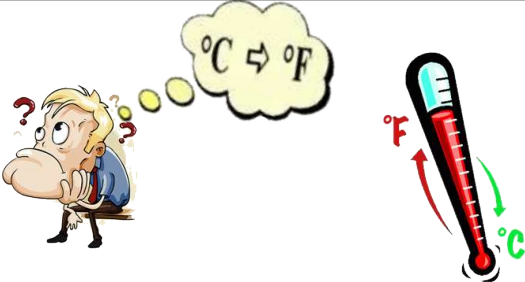
Sep 7-2:50 PM

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.



Oct 2-9:00 PM



**Converting Temperatures**


Nov 28-1:06 PM

Celsius **F** Fahrenheit

Nov 27-5:10 PM

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?

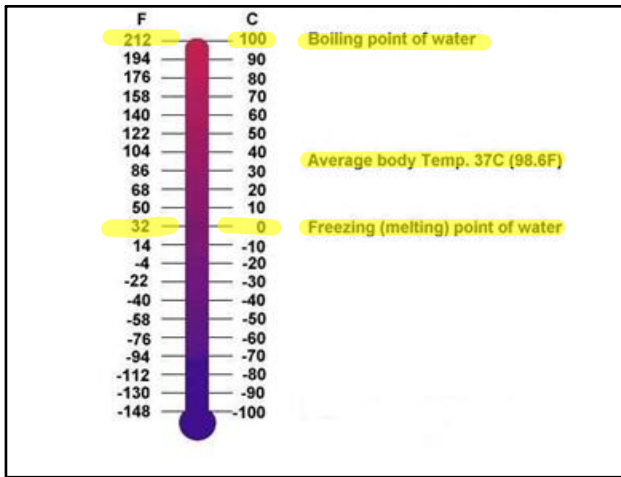


Oct 2-9:12 PM

BAKE	MICROWAVE
<p>1. Preheat oven to <b>400°F</b>. Remove plastic wrap from meatballs and place meatballs in a baking dish. Heat meatballs thoroughly according to times below or until internal temperature reaches <b>160°F</b>.</p> <p><b>Defrosted:</b> 20-25 minutes</p> <p><b>Frozen:</b> 30-35 minutes</p>	<p>1. Remove plastic wrap from meatballs and place meatballs in a microwave safe dish. Heat meatballs thoroughly according to times below or until internal temperature reaches <b>160°F</b>.</p> <p><b>Defrosted:</b> 3-5 minutes</p> <p><b>Frozen:</b> 5-7 minutes</p>
CROCKPOT	STOVETOP
<p>1. Remove plastic wrap from meatballs. Place meatballs in crockpot and heat on highest setting according to times below or until internal temperature of meatballs reaches <b>160°F</b>.</p> <p><b>Defrosted:</b> 1.5-2 hours, stirring periodically for even heating</p> <p><b>Frozen:</b> 2-2.5 hours, stirring periodically for even heating</p>	<p>1. Preheat nonstick skillet to medium low heat. Remove plastic wrap from meatballs and place meatballs in skillet. Pan fry over medium low heat, covered, according to times below or until internal temperature reaches <b>160°F</b>.</p> <p><b>Defrosted:</b> 16-20 minutes, turn frequently for even heating</p> <p><b>Frozen:</b> 20-25 minutes, turn frequently for even heating</p>

Appliances vary. Heating times approximate.

Oct 2-9:19 PM



Oct 2-9:42 PM

**COMPARISONS:**

- Thus, there is a 100-degree difference between the freezing and boiling points on the Celsius scale, while on the Fahrenheit scale there is a 180-degree difference.
- Therefore, the relationship between the size of the degrees can be expressed as
 
$$\frac{C}{F} = \frac{100}{180} = \frac{5}{9}$$
 This means that each degree Fahrenheit is  $\frac{5}{9}$  of a degree Celsius.
- Since 0°C is equivalent to 32°F we must subtract 32 from the Fahrenheit temperature before we multiply by  $\frac{5}{9}$ .
- Thus, the formula for converting degrees Fahrenheit to degrees Celsius is:
 
$$C = \frac{5}{9}(F - 32)$$

Sep 29-8:52 PM

Converting Fahrenheit to Celsius

**F** → **C**

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

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

Nov 28-1:11 PM

**Convert -4°F to degrees Celsius.**

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

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

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

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

Nov 28-1:19 PM

**Convert 78°F to degrees Celsius.**

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

$$\frac{5}{9}(78 - 32) = \frac{5(46)}{9}$$

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

Nov 28-1:25 PM

Converting Celsius to Fahrenheit

**C** → **F**

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

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

Nov 28-1:11 PM

Convert 58°C to degrees Fahrenheit.

$$\begin{aligned}
 F &= 9/5 C + 32 \\
 &= \frac{9(58)}{5} + 32 \\
 &= \frac{522}{5} + 32 \\
 &= 104.4 + 32 \\
 &= 136.4^\circ F
 \end{aligned}$$

Nov 28-1:31 PM

Convert 14°C to degrees Fahrenheit.

$$\begin{aligned}
 F &= 9/5 C + 32 \\
 &= \frac{9(14)}{5} + 32 \\
 &= 57.2^\circ F
 \end{aligned}$$

Nov 28-1:31 PM

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 degrees Fahrenheit?



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

$$\begin{aligned}
 F &= \frac{9C}{5} + 32 \\
 F &= \frac{9(39)}{5} + 32 \\
 &= 70.2 + 32 \\
 &= 102.2^\circ F
 \end{aligned}$$

Nov 28-1:59 PM

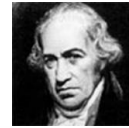
### Roots of Temperature

Galileo Thermoscope 1592



Galileo Galilei (1564 - 1642)

Fahrenheit Scale 1714



Daniel Gabriel Fahrenheit (1686 - 1736)

Celsius Scale 1742



Anders Celsius (1701 - 1744)



Sep 29-9:00 PM

## HOMEWORK...

TEXT p. 193 # 1 - 3

5.1 Worksheet - Temperature Conversions.docx



Oct 3-10:49 AM

#### Temperature Conversions 4.1

- Convert following temperature to degree Fahrenheit
  - 35°C
  - 8°C
  - 165°C
  - 21°C
  - 40°C
- Convert the following temperature to degrees Celsius
  - 20°F
  - 80°F
  - 375°F
  - 2°F
  - 0°F
- Which is hotter, a blow torch flame at 1300°C or a candle flame at 1830°F? By how much hotter is the flame than the other.
- 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 temperature in degrees Celsius.
  - Bituminous material must be between 200°F and 260°F
- When the human body reaches a temperature of 41°C, it is said to be in a state of "medical emergency". What is this temperature in degrees Celsius?

Mar 9-4:41 PM

Text book  
Page 193 -194

1. Cooked meat must reach a recommended internal temperature before it is safe to eat. A cookbook contains a list stated in degrees Fahrenheit.  
Determine the corresponding temperatures in degrees Celsius.

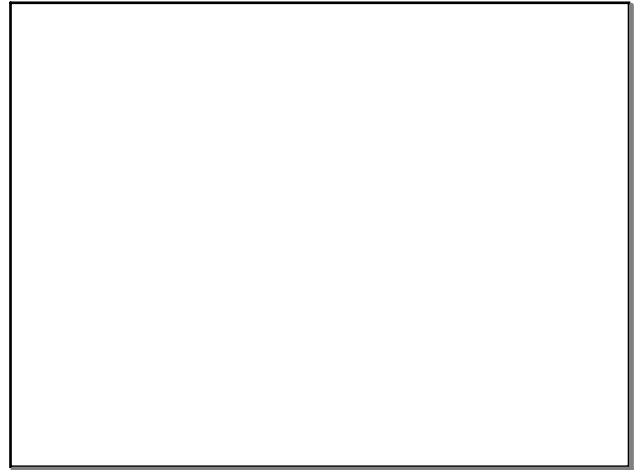
**FIGURE 5.1**

**Recommended Internal Temperatures**

Meat	Temperature
ground meats	160°F
beef (medium rare)	145°F
beef (well-done)	170°F
chicken (whole)	165°F

2. Mandy supervises a road construction crew. She knows that she must modify the asphalt paving mixture her crew uses if temperatures drop below 21°C. What is this temperature in degrees Fahrenheit? Why would temperature have an effect on the paving mixture?
3. Chan works at a building construction site. His boss told him that he does not have to work if the temperature is above 105°F or below -15°F. Chan has a thermometer that measures in degrees Celsius. What are the temperatures given by Chan's boss, in degrees Celsius?

Mar 9-4:24 PM



Oct 7-10:17 AM

## Attachments

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Worksheet - EXTRA Practice Converting Temperatures.docx

5.1 Worksheet - Temperature Conversions.docx