

## **Lesson Overview**

### **Temperature and Density**

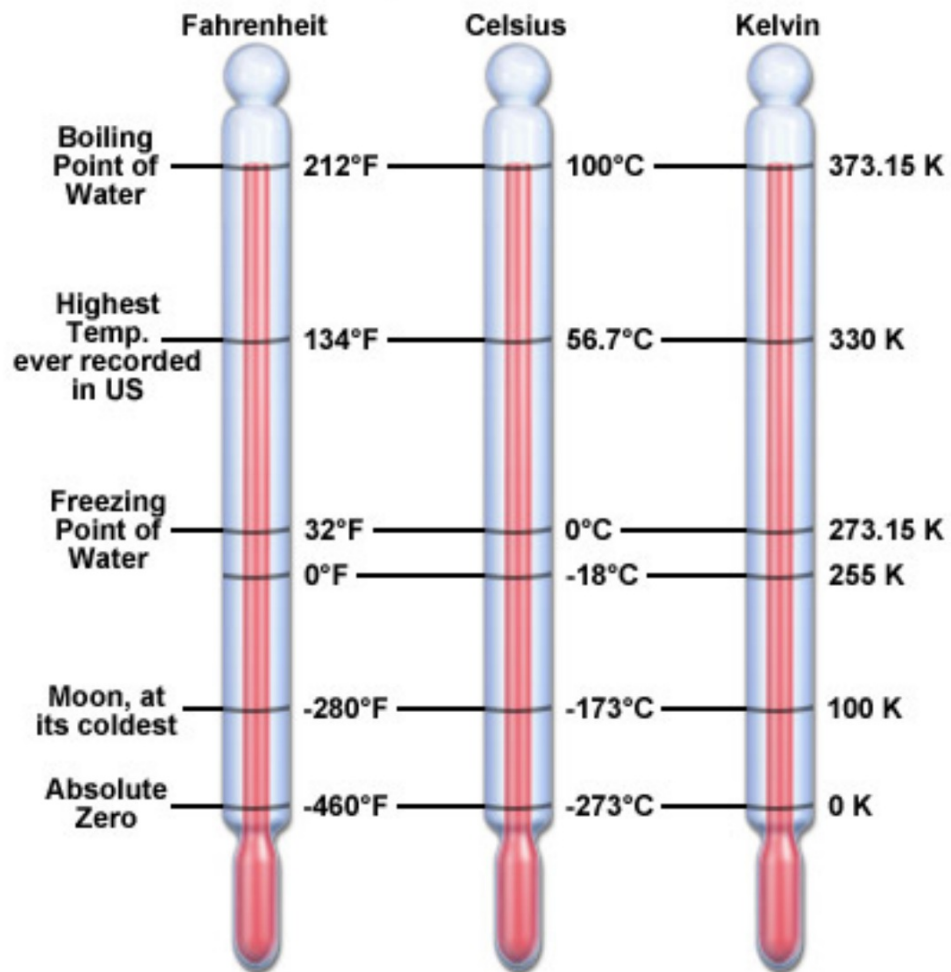
**Objective: The student will be able to (1) convert temperatures in the four temperature systems and (2) compute density of substances.**

#### **Connections:**

**@ Travel -- In a different country? Need to figure out what to wear outside?**

**@ Chemistry -- Reference materials rarely use Fahrenheit. How do I interconvert?**

## Temperature Scales



## Temperature Conversions

$$^{\circ}\text{F} = 1.8^{\circ}\text{C} + 32$$

$$\text{K} = 273.15 + ^{\circ}\text{C}$$

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

$$\text{R} = 1.8(\text{K})$$

**These problems  
are simple plug-  
and-chug**

**Rankine**

## **Examples and Practice**

**Today's high is 75.0 °F. What is this in celsius?**

**Based on the previous problem, what is this temperature in Kelvin (K)? Rankine (R)?**

# Density Problems

Density triangle

## **Example 1**

A substance has a mass of 45.6 grams in a 366 ml graduated cylinder. What is the density of this substance?

What is the density (in g/cm<sup>3</sup>) of a regular metal cylinder if it has a mass of 322 grams, a height of 355 mm and a radius of 23.6 mm?

$$V = \pi r^2 h$$



## Volumes of Shapes (that you may have forgotten)

$$V_{\text{cube}} = l \times w \times h \quad (\text{length} \times \text{width} \times \text{height})$$

$$V_{\text{sphere}} = \frac{4}{3}\pi r^3$$

$$V_{\text{cone}} = \frac{1}{3}\pi r^2 h$$

$$V_{\text{cylinder}} = \pi r^2 h$$