Project 1 – Temperature scales

Assessment: 10 points of course total

Due 1/28/2008

- Electronic format emailed to me if possible
- Hard copy on the 15th if I don't already have it in email by then

Short written report answering items 1-6. Report should include text, equations, and 1 or more graphs.

- Assume the reader has not read the assignment, may not familiar with any details of Farenheit and Celsius scales, but can read and understand equations and graphs.
- Short and simple is best – if all of the important information is there.

How to work as a group (if you decide to)

- Division of labor is up to you – probably a good idea to have a designated editor, though
- Get organized now, then use email, phone etc
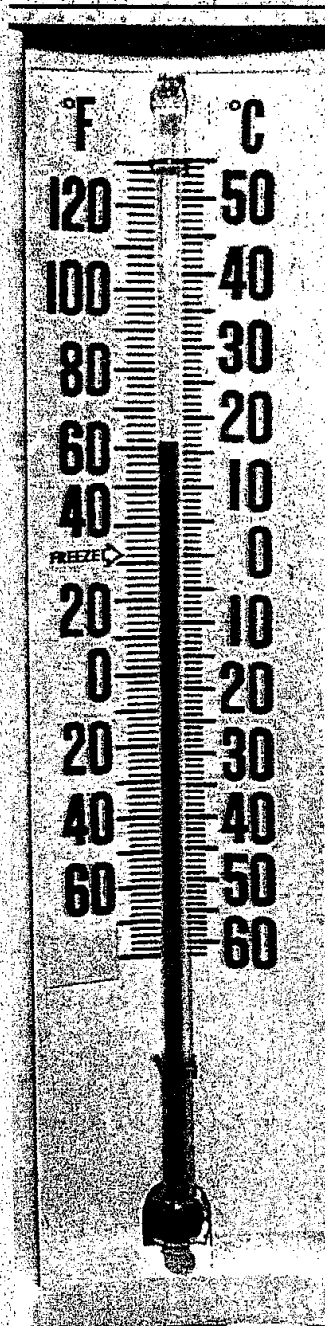
Mathematical models are often used to represent the physical world. These models may take many forms, including equations, formulas, and graphs. When the model accurately reflects the real world, it may enable us to predict certain outcomes without actually using physical experimentation. Other models, such as the one presented here, result from different ways of measuring a particular quantity. They make it easy to compare the different measurement systems.

There are two common units that we (the average citizens of the world) use to measure temperature. One is the Fahrenheit scale, the usual one seen on U.S. television weather reports; the other is the Celsius, or centigrade, scale, the usual one seen on Canadian television. The two scales are linearly related and calibrated using the freezing and boiling points of water at sea level.

Temperature Scale	Fahrenheit Scale	Celsius Scale
Water Freezes	32°	0°
Water Boils	212°	100°
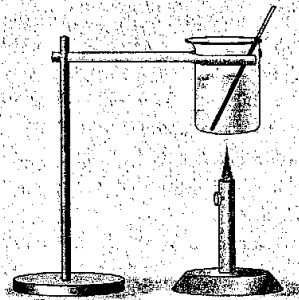
1. Write a formula that relates Fahrenheit temperature F to Celsius temperature C. Your answer should be in the form of $F = mC + b$.

2. Write a similar formula that relates Celsius to Fahrenheit.

3. If the temperature changes 1° Fahrenheit, how many degrees Celsius does the temperature change? What happens to the Fahrenheit temperature when the Celsius temperature changes 1°? What do the answers to these questions have to do with the models from questions 1 and 2?

4. Common wisdom (which is often neither) has it that the "normal" human body temperature is 98.6° Fahrenheit. What is this temperature in degrees Celsius?

5. Where do the two scales agree? That is, when is the temperature in degrees Fahrenheit equal to the temperature in degrees Celsius?

6. On the Kelvin scale, water freezes at 273°. One Kelvin is the same size as 1° Celsius. At what Kelvin temperature does water boil?