Comparing Temperature Scales

Fahrenheit	Celsius	Kelvin

Water freezes —— 32 0 273

Fahrenheit	Celsius	Kelvin
40		
50	10	283
60		
70	20	293
80		
90	30	303
100		
110	40	313
120	50	323
130		
140	60	333
150		
160	70	343
170		
180	80	353
190		
200	90	363
210		

Water boils —— 100 373

212
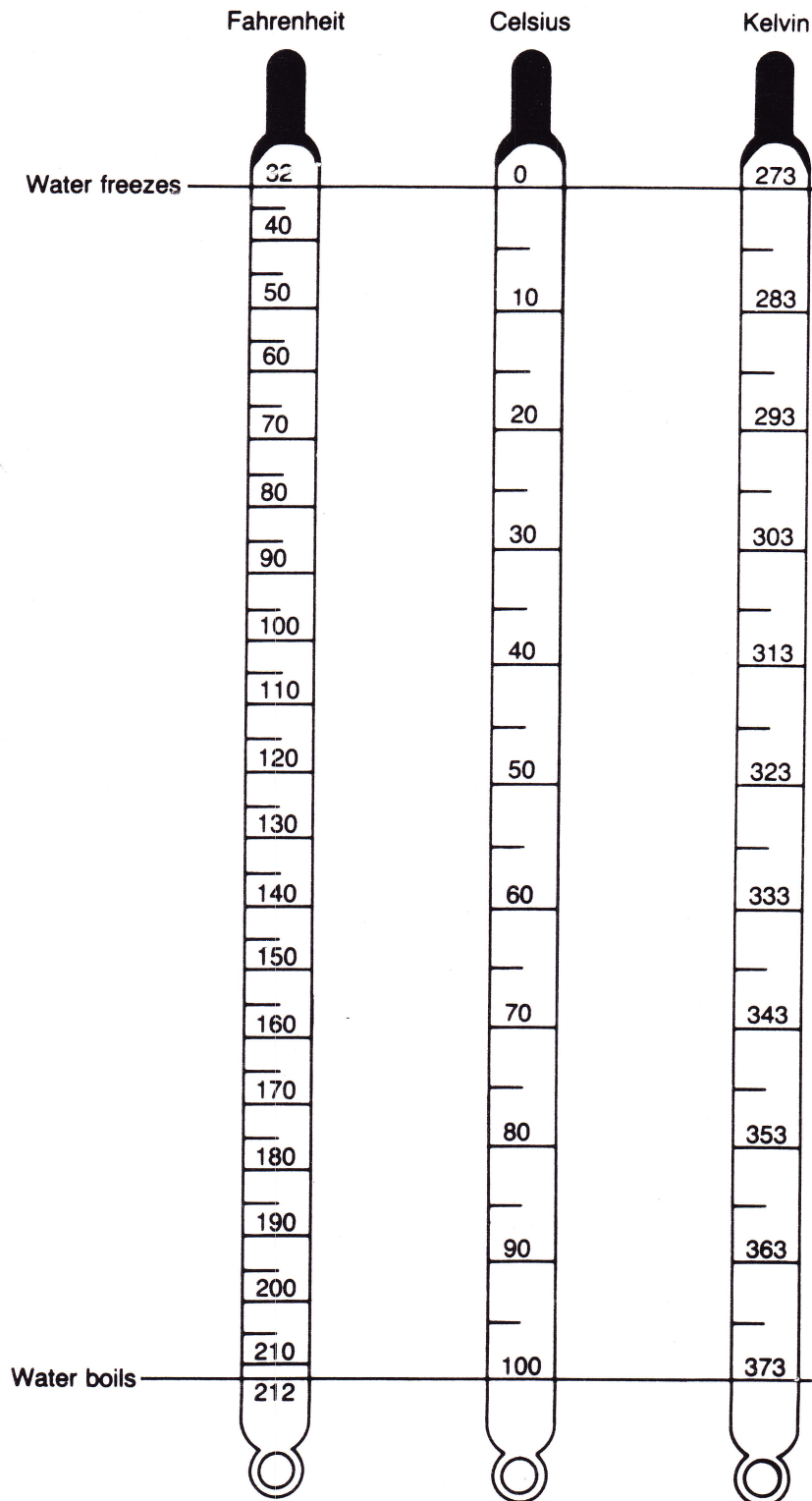
Comparing Fahrenheit, Celsius, and Kelvin Temperature Scales

Answer the following questions by using the chart of the three temperature scales provided by your teacher. Use a straight edge to read the corresponding values of the three scales.

1. At what temperature does water freeze on the Fahrenheit scale? _____

   On the Celsius scale? _____

   On the Kelvin scale? _____

2. At what temperature does water boil on the Celsius scale? _____

   On the Kelvin scale? _____

   On the Fahrenheit scale? _____

3. The weather forecaster predicts that today's high will be 70°. Which temperature scale is being

   used? _____

   What would be the corresponding temperatures on the other two scales? _____   _____

4. "It was so cold yesterday that the temperature only reached 275°!" Which temperature scale is

   being used? _____

   What would be the corresponding temperatures on the other two scales? _____   _____

5. "Today's temperature of 42° in Chicago set a record high for the month of August." Which

   temperature scale is being used? _____

   What would be the corresponding temperatures on the other two scales? _____   _____

Deriving the Conversion Factors for the Celsius and Kelvin Scales

A chart showing the three different temperature scales has been provided for you by your teacher. Use it to complete this activity. Place a straight edge across the Celsius and Kelvin scales to read their corresponding values.

1. Complete the following table and answer the questions that follow it.

	Celsius	Kelvin
T_1	30°	°
T_2	40°	°
$T_2 - T_1$	°	°
$\dfrac{T_2 - T_1}{10}$	°	°

   a. Is an increase of 10 degrees on the Celsius scale also an increase of 10 degrees on the Kelvin scale? _____

   b. Is the size of one degree on the Celsius scale the same as the size of one degree on the Kelvin scale? _____

2. Complete the following table and answer the question that follows it.

Celsius		Kelvin	
T_3	50°	T_4	°
T_5	80°	T_6	°
$T_4 - T_3 =$		°	
$T_6 - T_5 =$		°	

What number must be added to the Celsius temperature in order to obtain the corresponding Kelvin temperature? _____

3. Complete the following conversion factors.

   a. degrees Celsius + _____° = degrees Kelvin

   b. degrees Kelvin − _____° = degrees Celsius

4. Using the conversion factors you have just derived, solve the following problems.

   a. 22°C = _____ °K   **d.** 273°K = _____ °C

   b. 83°C = _____ °K   **e.** 100°K = _____ °C

   c. 100°C = _____ °K