1. **Temperature: Put some hot water, warm water, and cold water in three bowls. Just use water from your faucet, and please be sure that the hot water is not too hot to touch! Place a finger in the hot water and a finger of the other hand in the cold water. After a few seconds, place them both in the warm water. Describe the sensations. Can you trust your senses for measuring temperature? Explain your answer.**

After placing my hand in the cold water and then putting it in the warm water, it felt hot. With that, the hot water on my hand also felt cooler in the warm water. Therefore because of these observations, it can be concluded that I cannot fully trust my senses for measuring temperature.

2. **You know that the normal temperature for a healthy person is about 98.6 Fahrenheit degrees. Express this temperature in degrees Celsius. F = 1.8C + 32.**

F = 98.6 degrees Fahrenheit

$$F = 1.8C + 32 \rightarrow C = 0.5555(F) - 17.7777$$

$$C = 0.5555(98.6) - 17.7777 = 36.99$$

**98.6 degrees Fahrenheit = 37 degrees Celsius**

3. **What is happening to the average kinetic energy of the molecules in a pot of water when it is heated on a stove? Explain your answer.**

When a pot of water is heated on a stove, the average kinetic energy of the molecules increases. This is due to the fact that since the temperature is rising due to the increase of heat, the kinetic energy increases because of the increase in the vibration of the molecules within the water.

4. **A metal rod is 25.000 cm long at 25.0 degrees Celsius. When heated to 102.0 degrees Celsius, it is 25.054 cm long. What is the coefficient of linear expansion for this metal.**

Given:

Original length ($L_1$) = 25 cm

Initial temperature ($T_1$) = 25 degrees Celsius

Final temperature ($T_2$) = 102 degrees Celsius

Final length ($L_2$) = 25.054 cm

Solve:

$$\alpha = \frac{L_2 - L_1}{L_1(T_2 - T_1)}$$

$$\alpha = \frac{25.054 - 25}{25(102 - 25)}$$

$$\alpha = 2.8 * 10^{-5}/C°$$

**5. What are the theoretical properties of a gas at a temperature of 0 Kelvin?**

For a gas at a temperature of 0 Kelvin, none of the particles would be moving (they are stationary). Furthermore, because of this (in simple terms), the average kinetic energy would be zero (as the temperature of is proportional to the average kinetic energy).