

4. a. When I began this experiment, my initial ideas were that the two metals plates would be the coolest, then the wooden plate, and finally the styrofoam would be the warmest. When I made these predications I didn't necessarily have an explanation. I simply used intuition and my previous knowledge that metal is usually fairly cool to the touch. I also expected that the materials would have different internal temperatures.

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After touching each material I found that half of my prediction was correct, and the other half not correct. The metals plates felt the coolest, then the wooden plate, and finally the strofoam was the warmest. However, when we measured the internal temperatures of each of the plates there was no variation. The internal temperature of each plate was the same, which was about 22 degrees Fahrenheit.

b. Powerful Ideas:

- When objects reach the same temperature they are said to have reached "**equilibrium**"
- Body heat transfers to the different plates at different rates
- Materials differ in their properties- Some are **insulators** and don't transfer heat very well while others are **conductors** and transfer heat very well
- Different materials transfer heat differently in respect to the materials they are created by

very nice
c. As difficult as it may be to believe that the temperature of the legs of a metal chair doesn't differ from the temperature of the plastic seat, this is the case. The internal temperature of these objects is the same. We think that their temperature differs because when we touch the metal legs they feel cooler on our hand than the plastic seat. However, in reality, both of these objects are sitting in the same room. As they sit in the same room they have reached the same "room temperature", or equilibrium. The reason that the metal feels cooler as we touch it is because our body heat is transferring to the plates at different rates. We are transferring our body heat to the different materials and depending on their properties our body heat will transfer to them more easily. Some materials are insulators, such as the Styrofoam. Due to the fact that it possesses this property our body heat didn't transfer as well, thus the material felt warm to the touch. On the other hand, the metal plates have the property of being a conductor. This allowed our body heat to transfer more easily when we touched the plates, thus causing them to feel cold to the touch. Essentially, our perception of temperature and what the actual temperature of an object is greatly varies due to the fact that our body is transferring heat to the object, thus causing us to believe that something is cool or warm.