

**Question 1: What is the problem you are trying to solve?**

**Ans:** I am trying to determine what clothing would be comfortable to wear on a hot sunny day taking into consideration color and type of material. There are three materials to choose from: wool, denim and nylon. Within each material there are five different colored jackets ranging from lightest, white, to darkest, black.

**Question 2: Form a hypothesis: What is the prediction you want to test?**

**Ans:** I believe the lighter color and the lighter material will be the coolest to wear on a hot sunny day. Based on my known sense of touch for each of these materials wool is a thick and heavy material, denim is lighter and less thick than wool but tight in structure and nylon is the lightest in weight and thickness. Light will generate heat and heat (light) will attract to darker colors since light begins as white to start with.

**Question 3: Test your hypothesis. How will you use the computer model to test your hypothesis? What steps will you follow? What data will you record? Conduct your experiment and record your results.**

**Ans:** I will first compare the lightest and the darkest colored jackets within the same material types and repeat for each material type. I will then chart (see below) the average temperatures to determine, by comparison in color and then by material. This will give me a good indication of which is the coolest material and color. I will also be able to see the degree of fluctuation in temperature for the three different materials and the corresponding colors.

**Question 4: Analyze the results of your experiment. Explain any patterns you observed.**

**Ans:** Overall, the color white is always cooler than yellow, green, blue and black for all three material types. A heavier material like wool is warmer than denim which is still warmer than nylon. The degree of difference in the materials in white was not that great. Black colored materials seemed to absorb the heat well and the heavier the material the warmer the temperature and the greater the difference. Based on a known feel of these materials wool is the heaviest and the warmest followed by denim and finally nylon was the coolest in white. Therefore, white nylon would be the chosen apparel on a hot sunny day.

**Question 5: Draw a conclusion. Did the results of your experiment support your hypothesis? Why or why not?**

**Ans:** With this experiment I was able to show that the white nylon jacket would be the coolest to wear on a hot sunny day.

**Question 6: How does the material of the jacket affect heat absorption?**

**Ans:** The darker the color the greater the absorption of heat and based on the known feel of the material, the heavier (more dense) material was able to hold in the heat, like the wool, rather than allow the heat to release and breathe, like the nylon – less absorption.

**Question 7: Describe the strengths and weaknesses of the computer model you used in the experiment. What other parameters could you use in such an experiment to determine the effect of color on heat absorption?**

**Ans:** The computer is only a simulation and in the open air on a hot sunny day there can be additional factors inflicted on this experiment to skew some of these consistencies. The wind, humidity, cloud cover and trajectory of the sun could all affect the results of this same experiment. In order to create an accurate experiment all items being tested would have to be exposed to the exact same elements at the exact same time.

**Question 8: How does the lab relate to the chapter topic?**

**Ans:** Within the first chapter was the introduction of the Scientific Method. Generalized, the Scientific Method involves the collection of observations, devising explanations or theories and testing the explanations or theories. Testing the hypothesis is done through experimentation. This lab used a controlled experiment to test a scientific method I devised.

