This homework is due on Thursday, January 13, at class time. The assignment will be accepted up until the start of class on Tuesday, January 18, with a 20% penalty. Assignments turned in after class that day will receive no credit, though I will look through them if you want me to.

1. (4 points) Label each of the following as Applied Research or Basic Research.
   a. __________ A chemist is studying a series of compounds made using the same element and discovers a new compound.
   b. __________ A tire manufacturer is experiencing difficulty with tire failures. A chemist is assigned the task of identifying and correcting the problem.
   c. __________ A physicist studies the interaction between coupled spinning particles at a distance.
   d. __________ A company assigns a materials scientist the task of determining why laboratory bench tops when cured warp a little bit.

2. (4 points) Identify each of the following as either a testable (use a “T” if you want) or untestable (use a “U” if you want) hypothesis.
   a. _____ People born under the astrological sign of Gemini are statistically taller than those born under other signs.
   b. _____ People born under the astrological sign of Gemini are nicer than those born under other signs.
   c. _____ A sugar cube will not burn if placed in a flame. However, if it is first dipped in cigarette ashes it will burn.
   d. _____ An automobile body may be prevented from rusting by connecting the negative pole of its battery to the car body.

3. (6 points) Carry out the risk-benefit analyses requested in Problem 15 on page 35 of the textbook. State whether the DQ is high or low and explain your reasoning in each of the three cases requested in the problem. Use the back of the page if necessary.