Supplementary *Check for Understanding* Problems

Scientific Method

1.   Do you agree with the following statement: "A scientific law is a mathematical statement of a scientific theory."? Briefly explain your answer.

2.   Suppose you want to test the effectiveness of various materials such as sunscreen lotions, clothing and sunglasses in shielding you from the ultraviolet (UV) radiation in sunlight. Describe an experiment you could do to test the effectiveness of these materials. What would serve as your control experiment? Will this be a quantitative or qualitiative determination of the effectiveness of the sunscreen materials?

Pseudoscience

1.   Suppose as a parent of a newborn you hear from television programs and Internet articles that there is a link between childhood immunizations and type 1 and type 2 diabetes. Meanwhile, your child's pediatrician claims there is no scientific basis for these claims. What would be your response in order to make an informed decision about this matter?

Representing Quantitative Information

1.   For a rectangle of constant area, how would you describe the relationship between the length and width of the rectangle? Explain.

2.   A car was purchased in 2001 for $24,000 and the market value of the car as a function of age (year after purchase) is listed below. Is there a linear relationship between market value and the age of the car? Explain why or why not.

Year	Market value
2001	$24,000
2002	$22,500
2003	$19,700
2004	$17,500
2005	$14,500
2006	$10,000
2007	$5,800

3.   For each of the following data sets, which quantity should be plotted on the *x*-axis.
       Explain.

   a)   temperature ($^{\circ}$C) and density of water

   b)   for several countries, cigarette consumption (per person per year) and deaths from
          lung cancer (per million persons per year)