1. **What are Likert items (a.k.a. Likert-style or Likert-type questions) and how are they distinguished from Likert scale questions?**

   Likert items are single statements used to measure the amount of agreement or disagreement with a statement whereas Likert scale questions consist of multiple Likert items used to quantify the level of agreement to a broader question.

   A really nuanced discussion is found here: http://www.john-uebersax.com/stat/likert.htm

2. **Come up with an example of a Likert item and a Likert scale question. For each question you have created, indicate the "type" of data (nominal, ordinal, ratio/interval) it generates.**

   **Likert item:**
   
   I understood the Lovelace and Brickman article completely.
   
   *Strongly agree / Somewhat agree / Neither agree nor disagree / Somewhat disagree / Strongly disagree*

   The data generated are ordinal; they may be put in order. However, they cannot be subdivided (i.e. there is no “agree and a half”).

   **Likert scale:**

   Please indicate how much you agree or disagree with each of these statements:

   *The Lovelace and Brickman article used simple language.*
   
   *Strongly agree / Somewhat agree / Neither agree nor disagree / Somewhat disagree / Strongly disagree*

   *The Lovelace and Brickman article presented good examples.*
   
   *Strongly agree / Somewhat agree / Neither agree nor disagree / Somewhat disagree / Strongly disagree*

   *The Lovelace and Brickman article presented information in a logical order.*
   
   *Strongly agree / Somewhat agree / Neither agree nor disagree / Somewhat disagree / Strongly disagree*

   Here, the responses may be converted to numerical values that represent the level of agreement. Therefore the resulting data are interval data.

3. **How can you best describe the data that result from these two question types?**

   Likert items are ordinal and they cannot be subdivided (i.e. there is no “agree and a half), so it is not appropriate to use descriptions like averages or standard deviation. Mode and median are great for describing these data.

   The interval data arising from Likert scale questions may be averaged. Means and standard deviations are great for describing these data.

4. **Typically, in classroom research, several conditions for using parametric tests are violated, so these tests are not appropriate. Which assumptions are violated in classroom research situations?**

   The major issue with classroom research is typically the small, non-random sample that is available. This results in a non-normal distribution in many cases.

5. **What are non-parametric statistical tests? How are non-parametric statistical tests different from parametric tests? What are the assumptions of non-parametric tests?**
Non-parametric statistical tests do not rely on normally-distributed data and their parameters (like means).

A great description of these tests is found here: [http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_Nonparametric/BS704_Nonparametric_print.html](http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_Nonparametric/BS704_Nonparametric_print.html)

6. How might non-parametric tests be more appropriate than parametric tests for classroom research?

Since non-parametric tests are not tied to a normal distribution, the small sample sizes (which are likely to show a non-normal distribution) of classrooms can be analyzed. In addition, ordinal data like Likert data can be used with non-parametric tests.

* This is not an exhaustive list. You may have some valid responses that do not appear here.