

CAUTION The concept of *countable* data plays a key role in the preceding definitions, but it is not a particularly easy concept to understand. Carefully study Example 3.

Example 3 Discrete/Continuous

- 1. Discrete Data of the Finite Type:** The numbers of eggs that hens lay in one week are *discrete* data because they are finite numbers, such as 5 and 7 that result from a counting process.
- 2. Discrete Data of the Infinite Type:** Consider the number of rolls of a die required to get an outcome of 2. It is possible that you could roll a die forever without ever getting a 2, but you can still *count* the number of rolls as you proceed. The collection of rolls is countable, because you can count them, even though you might go on counting forever.
- 3. Continuous Data:** During a year, a cow might yield an amount of milk that can be any value between 0 liters and 7000 liters. There are infinitely many values between 0 liters and 7000 liters, but it is impossible to *count* the number of different possible values on such a continuous scale.



When we are describing smaller amounts, correct grammar dictates that we use “fewer” for discrete amounts and “less” for continuous amounts. It is correct to say that we drank *fewer* cans of cola and that, in the process, we drank *less* cola. The numbers of cans of cola are discrete data, whereas the volume amounts of cola are continuous data.

Levels of measurement

Another common way of classifying data is to use four levels of measurement: nominal, ordinal, interval, and ratio. When we are applying statistics to real problems, the level of measurement of the data helps us decide which procedure to use. There will be some references to these levels of measurement in this book, but the important point here is based on common sense: *Don't do computations and don't use statistical methods that are not appropriate for the data.* For example, it would not make sense to compute an average (mean) of Social Security numbers, because those numbers are data that are used for identification, and they don't represent measurements or counts of anything.

DEFINITION The **nominal level of measurement** is characterized by data that consist of names, labels, or categories only. The data cannot be arranged in an ordering scheme (such as low to high).