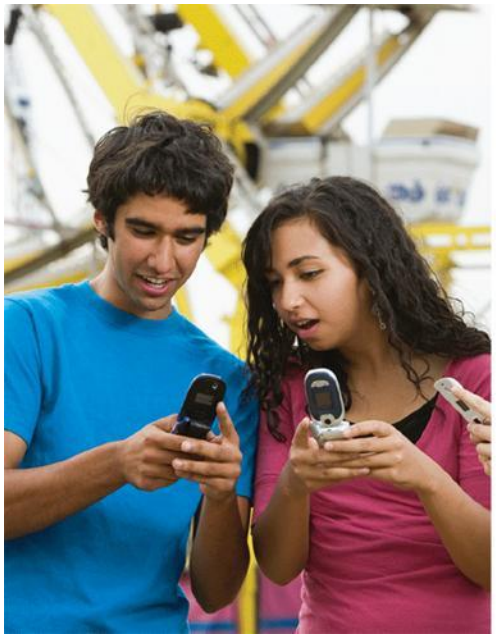
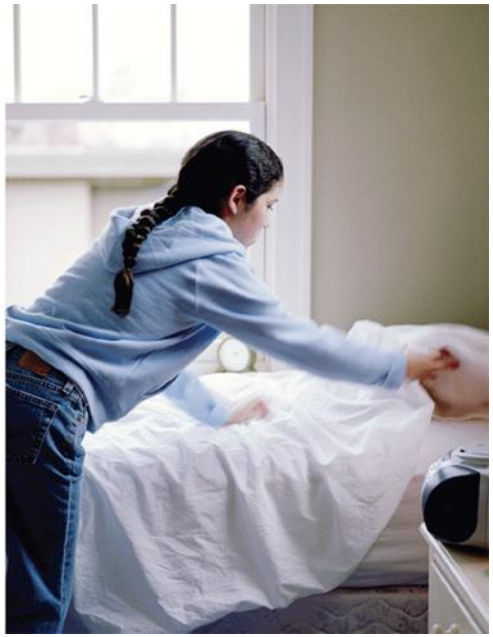
1 Statistics





1.2 Measurability and Variability

Measurability and Variability

Within a set of measurement data, we always expect variation. If little or no variation is found, we would guess that the measuring device is not calibrated with a small enough unit.

For example, we take a carton of a favorite candy bar and weigh each bar individually. We observe that each of the 24 candy bars weighs 7/8 ounce, to the nearest 1/8 ounce.

Does this mean that the bars are all identical in weight?

Measurability and Variability

Not really! Suppose we were to weigh them on an analytical balance that weighs to the nearest ten-thousandth of an ounce. Now the 24 weights will most likely show **variability**.

It does not matter what the response variable is; there will most likely be variability in the data if the tool of measurement is precise enough.

One of the primary objectives of statistical analysis is measuring variability.

Measurability and Variability

For example, in the study of quality control, measuring variability is absolutely essential.

Controlling (or reducing) the variability in a manufacturing process is a field all its own–namely, statistical process control.