

When something random happens, we say that exactly one **outcome** occurs.

An **event** is a collection or a set of outcomes.

The **sample space** is the set of all outcomes. Denote the sample space using the letter S .

The **empty set**, denoted by \emptyset , is the event that contains no outcomes whatsoever.

If all of the outcomes in event A are also contained in event B , we say that A is a subset of B , denoted by $A \subset B$.

Set notation is handy for working with events. Set notation looks like

{the contents of the event | conditions on the event}

The **union** of events contains all outcomes that are in at least one of the events. The union is denoted by a cup symbol, \cup .

The **intersection** of events contains all outcomes that are in all the events. An intersection is denoted by a cap, \cap .

The **complement** of an event A is the event containing all outcomes not in A . The complement of A is denoted by A^c .

Events are **pairwise disjoint** if they have no overlaps. By an overlap, we mean an outcome that is found in a pair of the events.

Notice that event A and its complement A^c are disjoint, and their union is all of the sample space S . We could write $A \cup A^c = S$.