

WEEK 8 REVIEW: Experiments, Sample Spaces, and Events

An EXPERIMENT is an activity with an observable result.

Tossing coins, rolling dice and choosing cards are all probability experiments.

The result of the experiment is called the OUTCOME or SAMPLE POINT.

The set of all outcomes or sample points is called the SAMPLE SPACE of the experiment.

Example: What is the sample space for choosing a bead from a bowl with one red bead, one white bead, and one blue bead?

$$S = \{r, w, b\}, n(S) = 3$$

$$2^3 = 8 \text{ subsets} = 8 \text{ events}$$

An EVENT is a subset of a sample space. That is, an event can contain one or more outcomes that are in the sample space.

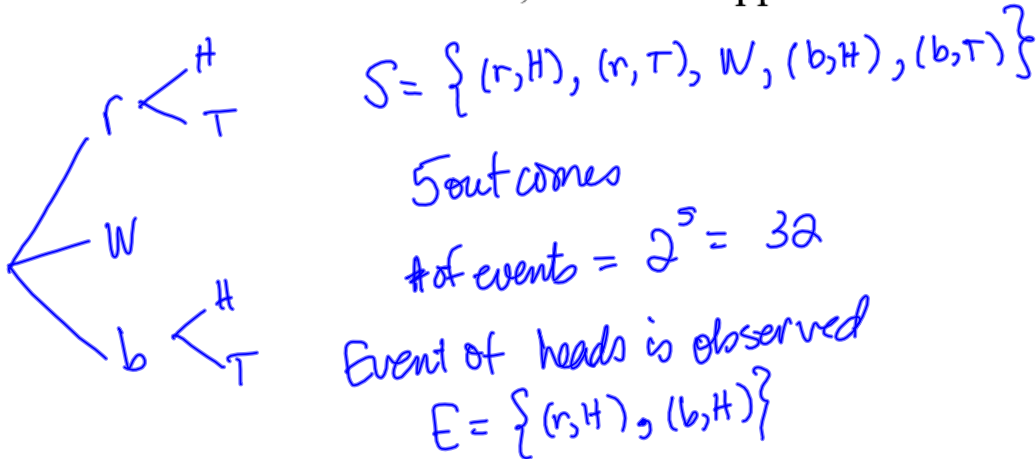
$$\emptyset, \{r\}, \{w\}, \{b\}, \{w, b\}, \{w, r\}, \{b, r\}, \{r, w, b\}$$

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Example: What is the sample space for first choosing a bead from a bowl with one red bead, one white bead, and one blue bead and then if the bead is red or blue, a coin is flipped?



These sample spaces have all been finite. That is, we can list all the elements. An infinite sample space has to be described; you can't list all the elements:

Example: What is the sample space for the time spent working on a homework set?

$$S = \{t \mid t \geq 0, t \text{ in minutes}\}$$

Describe the event of spending between one and two hours on a homework set.

$$E = \{t \mid 60 < t < 120\}$$