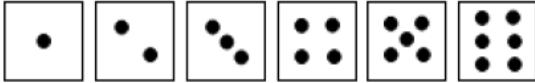# SAMPLE SPACES AND BASIC PROBABILITY

EVENT: An outcome (called a simple event) or a combination of outcomes (called a compound event)

SAMPLE SPACE: Set of all possible simple events

EXAMPLE 1:   Rolling 1 die: Sample Space: S = { _____ }

EXAMPLE 2:   **A coin is tossed twice.**

Assume the coin is a fair coin - it has equal probability of landing on Head (H) or Tail (T).
Write the sample space.

Find the probability of getting at least one head.

EXAMPLE 3:   **A coin is tossed three times.**

Assume the coin is a fair coin - it has equal probability of landing on Head (H) or Tail (T).

Write the sample space.

3a. Find the probability that at least one head is obtained

3b. Find the probability that all three tosses have the same outcome

3c. Find the probability that the first and third tosses have the same outcome.

EXAMPLE 4: Two dice are tossed.

Write the sample space.

Find the probability of getting a sum of 8

(1, 1) (1, 2) (1, 3) (1, 4) (1, 5) (1, 6)
(2, 1) (2, 2) (2, 3) (2, 4) (2, 5) (2, 6)
(3, 1) (3, 2) (3, 3) (3, 4) (3, 5) (3, 6)
(4, 1) (4, 2) (4, 3) (4, 4) (4, 5) (4, 6)
(5, 1) (5, 2) (5, 3) (5, 4) (5, 5) (5, 6)
(6, 1) (6, 2) (6, 3) (6, 4) (6, 5) (6, 6)

Find the probability of getting a sum of at least 8

Find the probability of getting a "double"

Notation

- P(E) = 0.8   is read as "the probability of event E is 0.8"
  - P stands for probability
  - ( ) is read "of"; it surrounds the event.
  - The event is written inside the parentheses
  - The value of the probability is on the other side of the equals sign.
- For probability our book uses E^C to represent the complement of an event.
  - E^C means event E does NOT happen
  - This notation for complement is different notation than our book used for set complements: $\overline{S}$.