

NOV 19/08

## INDEPENDENT EVENTS

FLIP 2 COINS

TT    HH    TH    HT

$\frac{1}{4}$      $\frac{1}{4}$      $\frac{1}{4}$      $\frac{1}{4}$

.25    .25    .25    .25

25%    25%    25%    25%

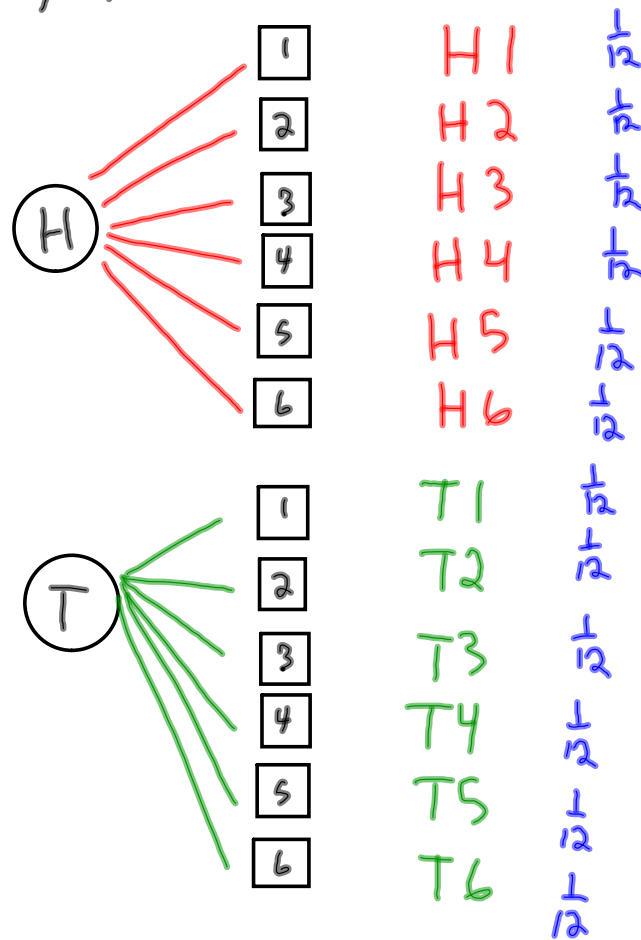
INDEPENDENT - THE OUTCOME OF ONE EVENT HAS NO EFFECT ON THE OUTCOME OF ANOTHER EVENT.

EXPERIMENTAL PROBABILITY - PROBABILITY FOUND BY CONDUCTING AN EXPERIMENT

THEORETICAL PROBABILITY - PROBABILITY IS CALCULATED WITH NO EXPERIMENT.

Ex. A COIN AND A 6-SIDED DIE

$$P(H, 6) = \frac{1}{12}$$



THE PROBABILITY OF A SET OF INDEPENDENT EVENTS IS THE PRODUCT OF THE PROBABILITIES OF THE INDIVIDUAL OUTCOMES

$$P(A \text{ AND } B) = P(A) \times P(B)$$

$$P(H, 6) = P(H) \times P(6)$$

$$= \frac{1}{2} \times \frac{1}{6}$$

$$= \frac{1}{12}$$

Ex. I HAVE 3 DECKS OF CARDS  
I TAKE ONE CARD FROM EACH  
DECK.

$$P(B, B, B) = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$$

$$P(\heartsuit, \clubsuit, \diamondsuit) = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{64}$$

$$P(2\heartsuit, B, Q) = \frac{1}{52} \times \frac{1}{2} \times \frac{1}{13} = \frac{1}{1352}$$

$$P(A\clubsuit, A\clubsuit, A\clubsuit) = \frac{1}{52} \times \frac{1}{52} \times \frac{1}{52}$$

$$= \frac{1}{140608} = 0.0000071 = 0.00071\%$$