10.5 Independent & Dependent Events

EQ: What is the difference between dependent & independent events?

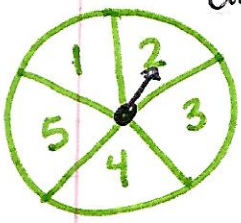
Independent Events: the occurance of one does not affect the liklihood of another.
ex: drawing a blue marble and flipping a tails.

* $P(A \text{ and } B) = P(A) \cdot P(B)$

Dependent Events: the occurance of one event does affect the liklihood of the others. ex: drawing a red marble twice

* $P(A \text{ and } B) = P(A) \cdot P(B \text{ after } A)$

Example 1: Independent Events. You spin a spinner and flip a coin. What is the probability of spinning a prime number and flipping tails?



$P(\text{prime})$ and $P(\text{tails})$

prime numbers → $\frac{3}{5}$ ← total

$\frac{1}{2}$ ← tails, ← total

$P(\text{prime \& tails}) = P(\text{prime}) \cdot P(\text{tails})$

$= \frac{3}{5} \cdot \frac{1}{2} = \frac{3}{10}$ or 30%

Example 2: Dependent Events.

People are randomly chosen to be game show contestants, from an audience of 100 people. You are with 5 of your relatives and 6 other friends. What is the probability that one of your relatives is chosen first, then one of your friends is chosen second?

P(relative)

relative → 5 / audience → 100 = 1/20

P(friend after relative)

6/99 = 2/33

$$P(\text{relative then friend}) = \frac{1}{20} \cdot \frac{2}{33}$$

$$= \frac{2}{660} = \frac{1}{330}$$