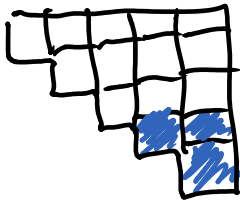
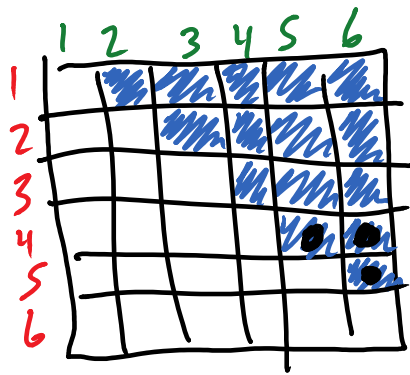


Roll two dice.



Let  $B$  denote the event that the green die has a result strictly larger than the red.  
 Let event  $A$  signify that the red die is  $\geq 4$ .

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{3/36}{15/36} = \frac{3}{15} = \frac{1}{5}.$$

Are  $A, B$  independent? We can check  $P(A|B) = P(A)??$   
 $P(A) = \frac{1}{2} \neq \frac{1}{5} = P(A|B)$   
 So  $A, B$  not independent; they are dependent.

←  $B$  "new world"  
 "new sample space"

$$P(A|B) = \frac{3}{15} = \frac{1}{5}.$$