

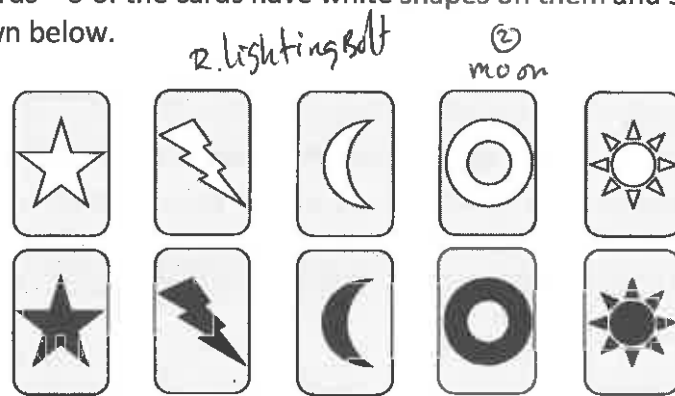
Lesson Four: Experiments with Single Selections

(Mutually Exclusive / Non-Mutually Exclusive Events)

Goals: Classify events as mutually exclusive or not mutually exclusive and explain the reasoning.
 Represent, using Venn diagrams, mutually exclusive and not mutually exclusive events.
 Solve problems that involve mutually exclusive and not mutually exclusive events.

Explanation Example 1

You have a deck of 10 cards – 5 of the cards have white shapes on them and 5 of the cards have black shapes on them, as shown below.



(outcomes)
TOTAL CARDS = 10

You select one card at random from this deck of cards.

- a) Determine the probability that the selected card is a lightning bolt or a moon.

$$P(L \text{ or } M) = P(L) + P(M) = \frac{2}{10} + \frac{2}{10} = \frac{4}{10}$$

- b) Determine the probability that the card is a black lightning bolt or a white donut.

$$P(\text{Black LB or White Donut}) = P(B) + P(W) = \frac{1}{10} + \frac{1}{10} = \frac{2}{20}$$

- c) Determine the probability of choosing a sun or a black card.

NOTE: you can't count the sun twice, so subtract it.

$$\frac{2}{10} + \frac{5}{10} - \frac{1}{10} = \frac{6}{10}$$

In your answer to c) you needed to be careful counting, as one of the outcomes in the sample space would have been considered a 'success' for both events; the black sun. It cannot be counted twice, as it is only one card.

The next example will explore this problem when you cannot see the sample space.