Mutually exclusive and independent events NAME:

This worksheet is designed to investigate the relationship between mutually exclusive and independent events.

1. Use the experiment of rolling two dice. Give two events that are **mutually exclusive and non-independent.**

2. Use the experiment of rolling two dice. Give two events that are **non-mutually exclusive and non-independent.**

3. Use the experiment of rolling two dice. Give two events that are **non-mutually exclusive and independent.**

4. Now it so happens that **two events cannot be mutually exclusive and independent unless at least one of the events cannot happen at all**. Let's prove this. Follow the steps outlined below.

Let A and B be two events that are mutually exclusive and independent.

a.) If A and B are mutually exclusive, what is P(A and B)?

b.) If A and B are independent, how else can we write P(A and B)?

c.) If A could not happen, what would P(A) have to be? If B could not happen, what would P(B) have to be?

d.) Put parts a through c together to show that if A and B are mutually exclusive and independent, then either A cannot happen or B cannot happen.