(A) Lesson Context

BIG PICTURE of this UNIT:	• How can we visualize events and outcomes when considering compound events ? • How can we calculate probabilities when considering compound events ?		
CONTEXT of this LESSON:	Where we've been We've visualized compound events (tree diagram & lists) and then calculated AND/OR probabilities for compound events & mutually exclusive/inclusive events	Where we are When dealing with compound events, WHY do we & HOW do we handle independent and dependent events?	Where we are heading Can we predict how likely is an event to occur? How can we use that knowledge?

(B) Lesson Objectives:

a. be able to distinguish between compound events that are either INDEPENDENT or INDEPENDENT
b. perform probability calculations once having identified the events as INDEPENDENT or DEPENDENT

(C) Key Terms for Independent & Dependent COMPOUND EVENTS

INDEPENDENT compound events – Two events are said to be **independent** if the result of the second event is not affected by the result of the first event.

DEPENDENT compound events – If the result of one event **IS** affected by the result of another event, the events are said to be **dependent. OR** another perspective on it is "because what happens **depends on** what happened before"

Examples: Are the events independent or dependent?

a. Roll a die; toss a coin
b. Take a marble out of a bag; take a second marble out of a bag.
c. Choose a person from a group of 50 persons. Choose another person from the same group.
d. Draw a card from the deck and put it back. Draw a card again from the same deck.
e. You have a jar with 24 pieces of chocolate candy and 14 pieces of orange candy. We take one piece of candy at random from the jar, put it back, and then take a second piece of candy at random from the jar.
f. Deni has a blue, red, and green tie. He also has a blue and green shirt. Deni chooses a random tie and shirt for work today.
g. Amy plays card games. He picks a card at random. Then without putting the first card back, he picks a second card at random.
h. Juan has 14 coins. He takes 3 of them at random, then he puts these back, and then pick 2 more coins at random.
i. Brett has $4,700 in his bank account. He withdraws $1,200 from his bank account to pay for rent. Brett books a vacation 3-days later that costs $4,000. He withdraws $3,500 from his account and goes on a payment pay for the remainder.
j. Canady has 10 handmade sheets. She takes 6 sheets at random. Then without putting these sheets back, she picks 2 sheets at random.
k. Jeff has 3 children. His first 2 children are boys. His last child is a girl.

Name:_____
Period:_____

Worksheet C3: Independent vs. Dependent Events

Independent events

1. Bag A contains 9 red marbles and 3 green marbles. Bag B contains 9 black marbles and 6 orange marbles. Find the probability of selecting one green marble from bag A and one black marble from bag B.

   _____

2. Two seniors, one from each government class are randomly selected to travel to Washington, D.C. Wes is in a class of 18 students and Maureen is in a class of 20 students. Find the probability that both Wes and Maureen will be selected.

   _____

3. If there was only one government class, and Wes and Maureen were in that class of 38 students, what would be the probability that both Wes and Maureen would be selected as the two students to go to Washington? Is this still an example of independent events?

   _____

Dependent Events

4. A box contains 5 purple marbles, 3 green marbles and 2 orange marbles. Two consecutive draws are made from the box **without replacement** of the first draw. Find the probability of each event.
   a. P(orange first, green second)

      _____

   b. P(both marbles are purple)

      _____

   c. P(the first marble is purple, and the second is ANY color EXCEPT purple)

      _____

5. If you draw two cards from a standard deck of 52 cards without replacement, find:
   a. P(King first, Jack second)

      _____

   b. P(face card first, ace second)

      _____

   c. P(2 aces)

      _____

6. Alicia selects at random from a box of thin crust pizzas. Each slice has a topping of mushrooms, pepperoni, or sausage.
    a. How many outcomes are there?

    _____

    b. P(sausage or mushrooms)

    _____

    c. P(thin crust or pepperoni)

    _____

    d. P(sausage or thick crust)

    _____

    e. P(thick or thin crust)

    _____

7. A card is drawn from the bag at the right.
    a. How many outcomes are there?

    _____

    b. P(3 or a 5)

    _____

    c. P(even or a prime)

    _____

    d. P(3 or less than 2)

    _____

8. A die is rolled and a spinner is spun.
    a. How many outcomes are there?

    _____

    b. P(1 and A)

    _____

    c. P(odd and B)

    _____

    d. P(composite and C)

    _____

    e. P(prime and D)

    _____

    f. P(1 and E)

    _____

9. In a bag there are 2 red marbles, 3 white marbles and 5 blue marbles. Once a marble is selected, it is NOT replaced. Find the following probabilities:
    a. P(red, then white)

    _____

    b. P(blue, then red)

    _____

    c. P(red, red, red)

    _____

    d. P(blue, blue, white)

    _____

10. In a bag there are 2 red marbles, 3 white marbles and 5 blue marbles. Once a marble is selected, it IS replaced. Find the following probabilities:
    a. P(white, blue)

    _____

    b. P(white, white)

    _____

    c. P(blue, white, red)

    _____

    d. P(blue, blue, blue)

    _____

11. A jar contains 4 white chips, 5 purple chips, and 1 black chip. Chips are selected randomly one at a time, and are not replaced. Find the probability of the following.
    a. P(purple then black)

    _____

    b. P(black then white)

    _____

    c. P(white then purple)

    _____

    d. P(purple then white)

    _____

    e. P(2 whites)

    _____

    f. P(2 purples)

    _____

    g. P(2 black chips)

    _____

    h. P(white, then purple, then black)

    _____

    i. P(3 whites)

    _____