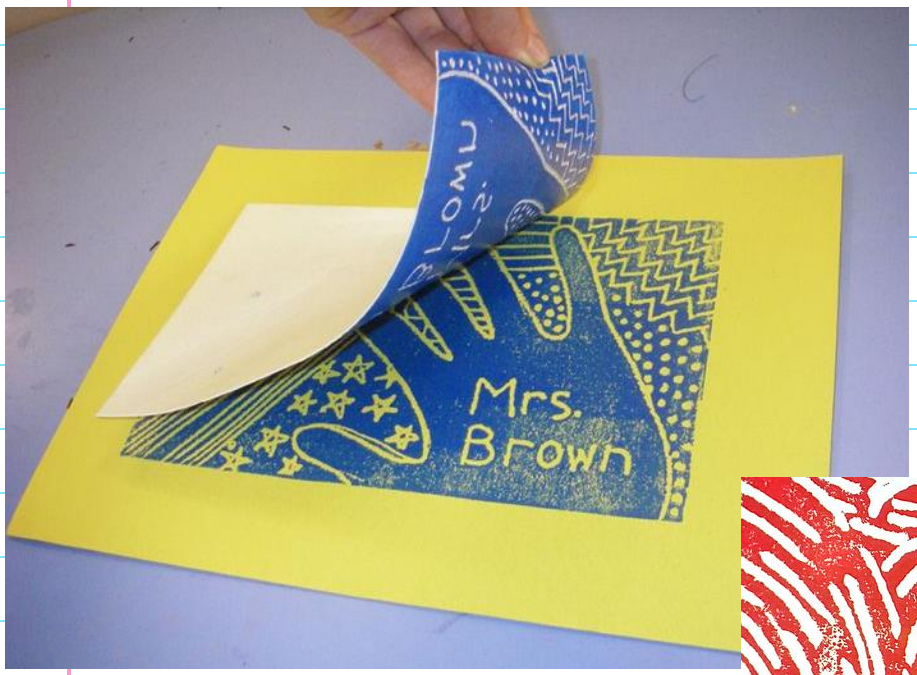
Styrofoam Recording Sheet



Lesson 11.4 Probability of Compound Events

Objective

TSW understand concept of probability

*understand dependent events

*use the rules of probability to solve problems with dependent events

Common Core State Standards

Extend 7 SP 8b- Represent sample spaces for compound events suing methods such as organized lists, tables and tree diagrams.

Extend 7 SP 8a- Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

Mathematical Practices *MP3 Construct arguments MP 4 Model Mathematics MP8 Express regularity in reasoning*

11.4 Dependents Events Day 2

Lesson Objectives

- Understand dependent events.
- Use the rules of probability to solve problems with dependent events.

Example 10 **Solve a probability problem involving dependent events without replacement.**

A jar contains 8 green marbles and 4 red marbles. Two marbles are randomly drawn, one at a time without replacement.

a) Find the probability of drawing a green marble followed by a red marble.

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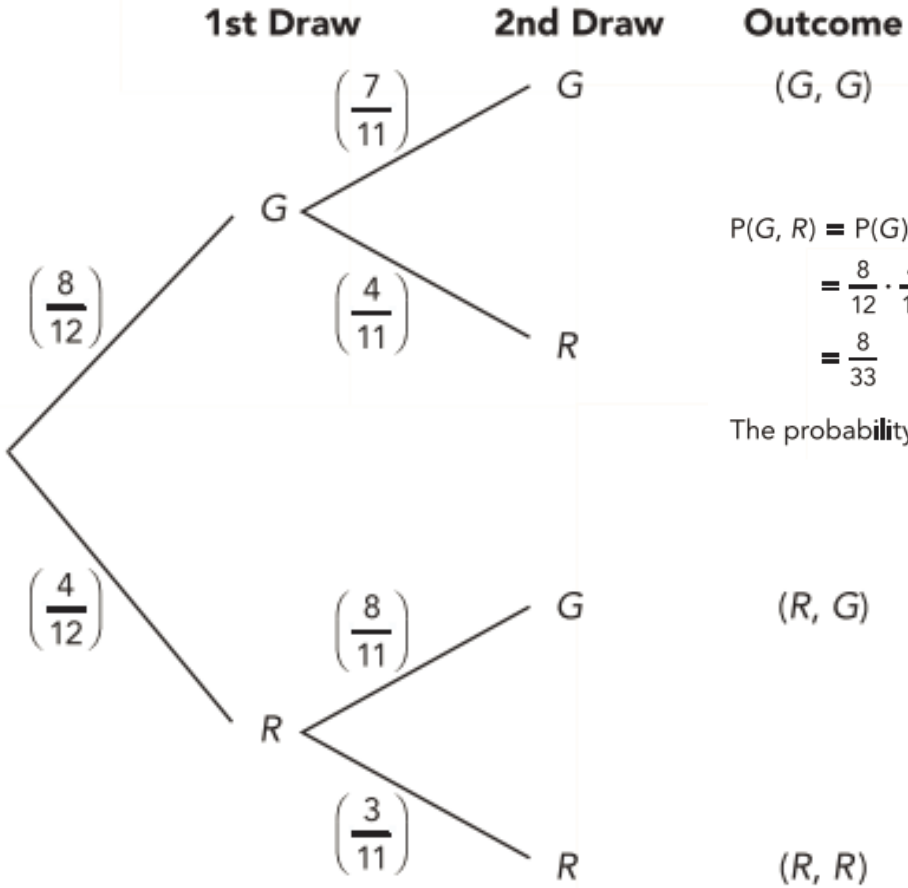
Solution



$$P(G, R) = P(G) \cdot P(R \text{ after } G)$$
$$= \frac{8}{12} \cdot \frac{4}{11}$$
$$= \frac{8}{33}$$

The probability of randomly drawing a green marble followed by a red marble is $\frac{8}{33}$.

G represents green
R represents red

b) Find the probability of randomly drawing a red marble followed by a green marble.

b) Find the probability of randomly drawing a red marble followed by a green marble.

Solution

$$P(R, G) = P(R) \cdot P(G \text{ after } R)$$

$$= \frac{4}{12} \cdot \frac{8}{11}$$

$$= \frac{8}{33}$$

The probability of randomly drawing a red marble followed by a green marble is $\frac{8}{33}$.

c) Find the probability of randomly drawing 2 green marbles.

c) Find the probability of randomly drawing 2 green marbles.

Solution

$$P(G, G) = P(G) \cdot P(G \text{ after } G)$$

$$= \frac{8}{12} \cdot \frac{7}{11}$$

$$= \frac{14}{33}$$

The probability of randomly drawing 2 green marbles is $\frac{14}{33}$.

d) Find the probability of randomly drawing 2 red marbles.

d) Find the probability of randomly drawing 2 red marbles.

Solution

$$P(R, R) = P(R) \cdot P(R \text{ after } R)$$

$$= \frac{4}{12} \cdot \frac{3}{11}$$

$$= \frac{1}{11}$$

The probability of randomly drawing 2 red marbles is $\frac{1}{11}$.

Guided Practice

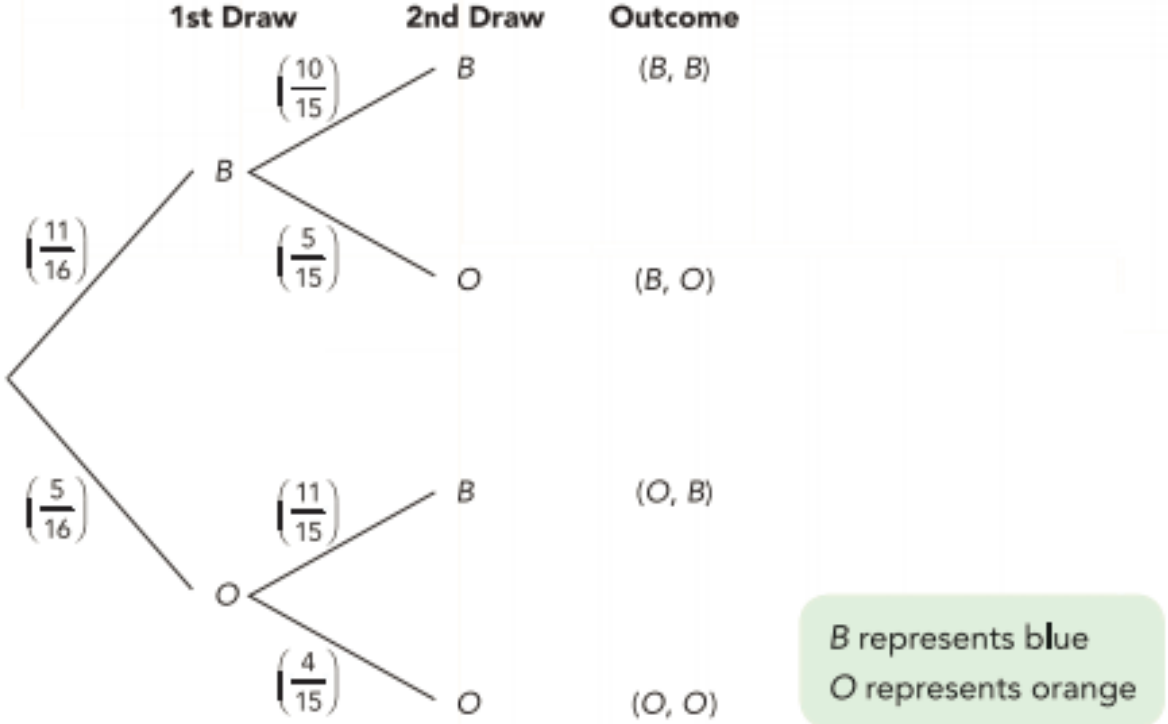
Solve. Show your work.

2 There are 16 colored pebbles in a jar. 11 of them are blue and the rest are orange. Two pebbles are randomly selected from the jar, one at a time without replacement.

a) Find the probability of taking an orange pebble followed by a blue pebble.

2 There are 16 colored pebbles in a jar. 11 of them are blue and the rest are orange. Two pebbles are randomly selected from the jar, one at a time without replacement.

a) Find the probability of taking an orange pebble followed by a blue pebble.



$P(O, B) = P(O) \cdot P(B \text{ after } O)$

$= \frac{?}{?} \cdot \frac{?}{?}$ $\frac{5}{16}; \frac{11}{15}$

$= \frac{?}{?}$ $\frac{11}{48}$

The probability of randomly taking an orange pebble followed by a blue pebble is $\frac{?}{}$. $\frac{11}{48}$

b) Find the probability of taking two orange pebbles.

$$P(O, O) = P(O) \cdot P(O \text{ after } O)$$
$$= \frac{?}{?} \cdot \frac{?}{?}$$
$$= \frac{?}{?}$$

The probability of randomly taking two orange pebbles is $\frac{?}{}$.

c) Find the probability of taking two blue pebbles.

$$P(B, B) = P(B) \cdot P(B \text{ after } B)$$
$$= \frac{?}{?} \cdot \frac{?}{?}$$
$$= \frac{?}{?}$$

The probability of randomly taking two blue pebbles is $\frac{?}{}$.

b) Find the probability of taking two orange pebbles.

$P(O, O) = P(O) \cdot P(O \text{ after } O)$

$= \frac{?}{?} \cdot \frac{?}{?}$ $\frac{5}{16}; \frac{4}{15}$

$= \frac{?}{?}$ $\frac{1}{12}$

The probability of randomly taking two orange pebbles is $\frac{?}{}$ $\frac{1}{12}$

c) Find the probability of taking two blue pebbles.

$P(B, B) = P(B) \cdot P(B \text{ after } B)$

$= \frac{?}{?} \cdot \frac{?}{?}$ $\frac{11}{16}; \frac{10}{15}$

$= \frac{?}{?}$ $\frac{11}{24}$

The probability of randomly taking two blue pebbles is $\frac{?}{}$ $\frac{11}{24}$

Lesson 11.4 Probability of Dependent Events

Practice 11.4 #7-9 Challenge-

*Solve created equations
"Challenge your brain"
*BuzzMath
*MangaHigh

Name:_____

Practice 11.4

State whether each pair of events is dependent or independent.

1. Drawing 2 red balls randomly, one at a time without replacement, from a bag of 6 balls
2. Tossing a coin twice
3. Reaching school late or on time for two consecutive days
4. Flooding of roads during rainy or sunny days

Draw a tree diagram for each situation.

5. 2 balls are drawn at random, one at a time without replacement, from a bag of 3 green balls and 18 red balls.
6. The probability of rain on a particular day is 0.3. If it rains, then the probability that Renee goes shopping is 0.75. If it does not rain, then the probability that she goes jogging is 0.72. Assume that shopping and jogging are mutually exclusive and complementary, and that rain and no rain are complementary.

Solve. Show your work.

7. Geraldine has a box of 13 colored pens: 3 blue, 4 red, and the rest black. What is the probability of drawing two blue pens randomly, one at a time without replacement?

Lesson Check #7 & 8 -can use the multiplication rule of probability to find probability of a favorable outcome

Probability of Compound Events

Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented CONNECTED to what you already knew?

2. What new ideas did you get that EXTENDED or pushed your thinking in new directions?

3. What is still CHALLENGING or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?