Just In Time Quick Check
Standard of Learning (SOL) 8.11b

Strand: Patterns, Functions, and Algebra

Standard of Learning (SOL) 8.11b
The student will determine probabilities for independent and dependent events.

Grade Level Skills:
- Determine the probability of two independent events.
- Determine the probability of two dependent events.

### Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:
- VDOE Mathematics Instructional Plans (MIPS)
  - 8.11 - Probability
- VDOE Word Wall Cards: Grade 8 (Word) | (PDF)
  - Probability of Independent Events
  - Probability of Dependent Events
- VDOE Rich Mathematical Tasks: Name of on-grade-level Task
  - 8.11 It's Your Lucky Day Task Template
- Desmos Activity
  - Independent vs. Dependent Events

Supporting and Prerequisite SOL: 8.11a, 7.8a, 6.1, 6.2a

SOL 8.11b - Just in Time Quick Check

1. Aaron spins the spinner twice. The spinner has 6 congruent sections as shown. What is the probability that he will spin an even number on the first spin and a three on the second spin? Write your answer as a fraction in simplest form.
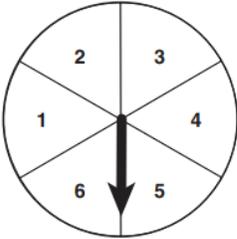
2. Kendra has a deck of ten cards that are of equal size and shape.
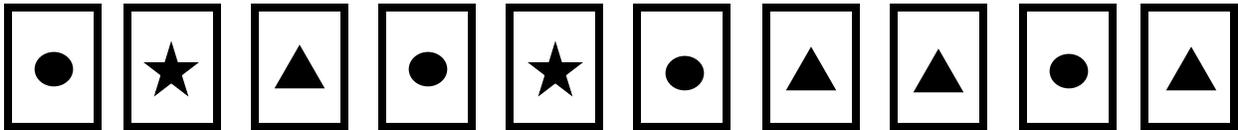
   What is the probability that Kendra will draw a star, not replace the card, and then draw a circle?

3. Robin spins each spinner one time. Each spinner has 8 congruent sections as shown. Determine the probability that she will spin a 1 on Spinner A and a G on Spinner B? Write your answer as a fraction in simplest form.

   Spinner A   **Spinner B**
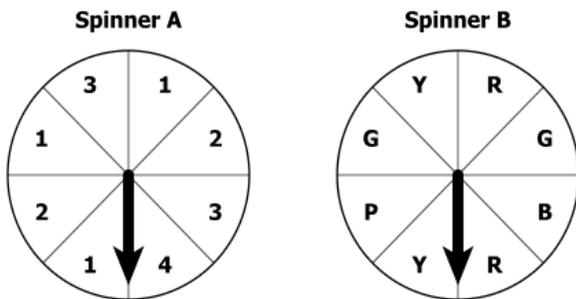
4. Matt has a bag of tiles that are all the same size and shape.

   Tiles in a Bag

Color	Number
Red	6
Yellow	4
Green	7
Blue	3

   What is the probability that Matt will pick a red tile from the bag, replace it, and then pick a tile that is NOT green? Write your answer as a decimal.

5. Desiree has some colored tickets in a bag that are the same size and shape.

   - The probability of selecting a blue ticket is 40%.
   - The probability of selecting a yellow ticket is 20%.
   - The probability of selecting a red ticket is 10%.
   - The probability of selecting a green ticket is 30%.

   Determine the probability of selecting a blue ticket, giving it away, and then selecting a green ticket.

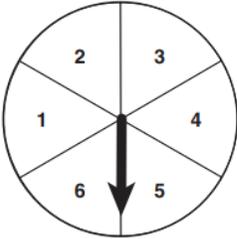   Jorge determined the probability of the two events to be $\frac{3}{25}$.

   Emilio determined the probability of the two events to be $\frac{2}{15}$.

   Who calculated the probability incorrectly? Explain what mistake the student made.

1. Aaron spins the spinner twice. The spinner has 6 congruent sections as shown. What is the probability that he will spin an even number on the first spin and a three on the second spin? Write your answer as a fraction in simplest form.

A common mistake a student may make is to see the problem as one simple event rather than two independent events. This may indicate that the student believes the event consists of 3 even numbers and 1 three resulting in a total of 4 desired outcomes as the numerator. The student may also think there are 6 possible outcomes in the sample space and write a denominator of 6 rather than the possible 36 total outcomes. This may indicate that the student does not understand that the formula: P(A and B) = P(A) ● P(B) is used when determining the probability of two independent events. The student may benefit from additional practice comparing simple events and independent events See examples on the Grade 8 Word Wall Cards and the Grade 7 Word Wall Cards and in the curriculum frameworks (8.11b and 7.8).

2. Kendra has a deck of ten cards that are of equal size and shape.
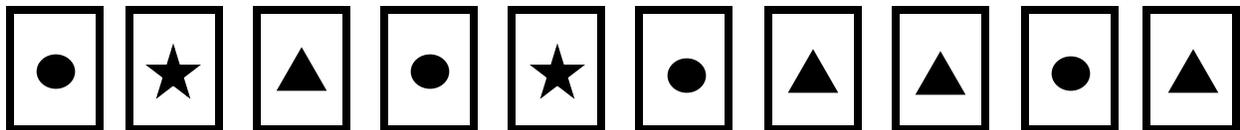
What is the probability that Kendra will draw a star, not replace the card, and then draw a circle?
A common error a student may make is to overlook that the number of cards changed after the first draw and determine the P(star, not replace, then circle) to be $\frac{2}{10} \times \frac{4}{10} = \frac{8}{100}$ or $\frac{2}{25}$. This may indicate that the student does not recognize that this is a dependent event and the denominator of the second fraction should have been reduced by one. The student may benefit from additional practice using the example on the Grade 8 Word Wall Cards (Probability of Dependent Events) as well as bullet 9 in Understanding the Standard of the Grade 8 Curriculum Framework.

3. Robin spins each spinner one time. Each spinner has 8 congruent sections as shown. Determine the probability that she will spin a 1 on Spinner A and a G on Spinner B? Write your answer as a fraction in simplest form.

Spinner A **Spinner B**
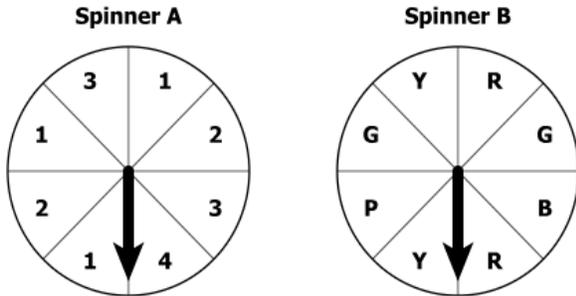
A common error that a student may make is to calculate the sum of the two fractions rather than the product, determining a probability of $\frac{5}{8}$. This may indicate that a student does not understand how to use the formula for determining the probability of two independent events, $P(A \text{ and } B) = P(A) \cdot P(B)$. The student may benefit from additional practice finding the probability of independent events using the VDOE Mathematics Instructional Plans (MIPS)-8.11 - Probability.

4. Matt has a bag of tiles that are all the same size and shape.

Tiles in a Bag

Color	Number
Red	6
Yellow	4
Green	7
Blue	3

What is the probability that Matt will pick a red tile from the bag, replace it, and then pick a tile that is NOT green? Write your answer as a decimal.

A common error a student may have is picking a tile that is green for the second pick. This might indicate that a student may not understand that "NOT green" means all of the colors except green. A student may benefit from a visual or physical representation of the tiles in a bag. This will allow the student to count the red tiles to determine the P(red), replace the tile, and then count how many of the tiles are NOT green to determine the second fraction.

5. Desiree has some colored tickets in a bag that are the same size and shape.

- The probability of selecting a blue ticket is 40%.
- The probability of selecting a yellow ticket is 20%.
- The probability of selecting a red ticket is 10%.
- The probability of selecting a green ticket is 30%.

Determine the probability of selecting a blue ticket, giving it away, and then selecting a green ticket.

Jorge determined the probability of the two events to be $\frac{3}{25}$.

Emilio determined the probability of the two events to be $\frac{2}{15}$.

Who calculated the probability incorrectly? Explain what mistake the student made.

A common error that a student may make is stating that Jorge calculated the probability correctly because they do not understand that "giving it away" signifies two dependent events. The student may have calculated the following: be $\frac{4}{10} \times \frac{3}{10} = \frac{12}{100}$ or $\frac{3}{25}$. The student may benefit from additional practice calculating the probability of two independent and two dependent events. Additional examples can be found in the VDOE Mathematics Instructional Plans (MIPS)-8.11 - Probability.