

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

Strand: Probability and Statistics

Standard of Learning (SOL) 8.11a

The student will compare and contrast the probability of independent and dependent events.

Grade Level Skills:

- Determine whether two events are independent or dependent.
- Compare and contrast the probability of independent and dependent events.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [8.11 - Probability](#) (Word) / [PDF Version](#)
- Word Wall Cards: Grade 8 ([Word](#)) | ([PDF](#))
 - Probability of Independent Events
 - Probability of Dependent Events
- VDOE Rich Mathematical Tasks: It's Your Lucky Day
 - [8.11 It's Your Lucky Day Task Template](#) (Word) / [PDF Version](#)
- Desmos Activity
 - [Independent vs. Dependent Probability](#)

Supporting and Prerequisite SOL: [8.1](#), [7.1c](#), [7.8a](#), [7.8b](#), [6.1](#), [6.2a](#), [6.2b](#)

SOL 8.11a - Just in Time Quick Check

1. Determine whether each situation described in the table best represents independent or dependent events.

Events	Independent	Dependent
Determining the probability that it will snow and that school will be cancelled		
Flipping two fair coins		
Spinning a spinner and rolling a fair number cube		

2. Keith has 20 tiles in a bag that are the same size and shape.

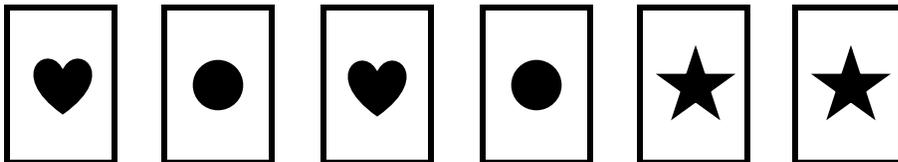
- 5 green tiles
- 6 yellow tiles
- 9 blue tiles

Keith will randomly select a green tile from the bag, not replace it, and then randomly select a blue tile from the bag.

Does this scenario describe two events that are independent or dependent?

Explain your thinking.

3. A deck of cards contains six equally shaped cards.



William randomly selects one card from the deck, replaces the card, and then randomly selects a second card.

Does this situation describe independent or dependent events? Explain your thinking.

4. All of the marbles in a bag are the same size and shape.

Marbles in a Bag

Color	Number
Blue	7
Green	10
Yellow	14
Red	19

- Bailey randomly selects a marble from the bag, does not replace it, and then randomly selects a second marble.
- Kelly randomly selects a marble from the bag, replaces it, and then randomly selects a second marble.

Who has the least probability of selecting a green marble and then a yellow marble? Explain your thinking.

5. A deck of cards the same size and shape contains 3 green cards, 5 yellow cards, and 4 blue cards. Michelle and Darin will randomly select cards from this deck.
- Michelle will randomly select one card, replace it, and then randomly select a second card.
 - Darin will randomly select one card, not replace it, then randomly select a second card.

Who has a greater probability of randomly selecting one blue card and then one yellow card? Explain your thinking.

6. Using the scenario below, write a question for a classmate to solve that involves determining the probability of two dependent events.
- Laura has a box of 12 donuts. The box contains 4 glazed donuts, 5 chocolate donuts, and 3 powdered donuts.

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Common Errors/Misconceptions and their Possible Indications

1. Determine whether each situation described in the table best represents independent or dependent events.

Events	Independent	Dependent
Determining the probability that it will snow and that school will be cancelled		
Flipping two fair coins		
Spinning a spinner and rolling a fair number cube		

The student may struggle with identifying whether two events are independent or dependent. This may indicate a need to provide hands-on experiences with manipulatives (fair coins, spinner, bag of marbles, fair number cubes) to develop a better understanding of the probability of independent and dependent events. Students may also benefit from using the Math 8 Word Wall Cards to reinforce the difference between independent and dependent events.

2. Keith has 20 tiles in a bag that are the same size and shape.

- 5 green tiles
- 6 yellow tiles
- 9 blue tiles

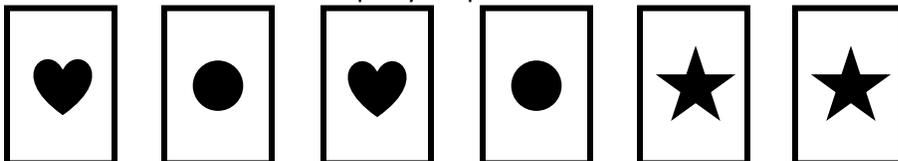
Keith will randomly select a green tile from the bag, not replace it, and then randomly select a blue tile from the bag.

Does this scenario describe two events that are independent or dependent?

Explain your thinking.

A student may incorrectly identify the scenario as two independent events. Another possibility is a student may highlight incorrect words because they do not have a solid understanding of the difference between independent and dependent events. A strategy may be highlighting the “not replace” in the scenario. This might help students differentiate between an independent or dependent event. Refer to the question one above for additional strategies.

3. A deck of cards contains six equally shaped cards.



William randomly selects one card from the deck, replaces the card, and then randomly selects a second card.

Does this situation describe independent or dependent events? Explain your thinking.

A student may incorrectly identify the type of probability event because they do not have a clear understanding of the difference between independent and dependent events. This may indicate that a student reads too quickly and may overlook the key phrase “replace the card.” Encourage the student to reread the question and highlight key words.

Students may not adequately explain their thinking in response to the second part of the question. Encourage the student to reread their response to determine if their answer explains why this is an example of two independent events. Students may also benefit from using the Math 8 Word Wall Cards to reinforce the difference between independent and dependent events.

4. All of the marbles in a bag are the same size and shape.

Marbles in a Bag

Color	Number
Blue	7
Green	10
Yellow	14
Red	19

- Bailey randomly selects a marble from the bag, does not replace it, and then randomly selects a second marble.
- Kelly randomly selects a marble from the bag, replaces it, and then randomly selects a second marble.

Who has the least probability of selecting a green marble and then a yellow marble? Explain your thinking.

A common mistake in calculating dependent probability is the student may not reduce the possible outcomes when determining the probability of the second event. This student may not understand the how to find the probability of dependent events and could benefit from additional practice. Refer to the 8.11b (Grade 8 Mathematics Curriculum Framework) and Math 8 Word Wall cards for additional practice.

Another mistake is a student may incorrectly compare the probabilities for Bailey and Kelly. The student may state that $7/245$ is greater than $7/125$ because the denominator is greater. A student may benefit from additional practice comparing fractions. Refer to 6.2b for additional practice. (Math 6 Curriculum Framework)

5. A deck of cards the same size and shape contains 3 green cards, 5 yellow cards, and 4 blue cards. Michelle and Darin will randomly select cards from this deck.
- Michelle will randomly select one card, replace it, and then randomly select a second card.
 - Darin will randomly select one card, not replace it, then randomly select a second card.

Who has a greater probability of randomly selecting one blue card and then one yellow card? Explain your thinking.

A common mistake is a student may incorrectly compare the probabilities for Michelle and Darin. The student may state that $20/144$ is greater than $20/132$ because the denominator is greater. A student could benefit from additional practice comparing fractions. Refer to 6.2b for additional practice. (Math 6 Curriculum Framework)

6. Using the scenario below, write a question for a classmate to solve that involves determining the probability of two dependent events.

Laura has a box of 12 donuts. The box contains 4 glazed donuts, 5 chocolate donuts, and 3 powdered donuts.

The student may write a question that describes an independent probability event rather than an event that is dependent. Students may benefit from a visual representation of the box of donuts to explore the context of the problem. Students may also benefit from the opportunity to examine problems with various contexts that describe both independent and dependent probability.