

Just In Time Quick Check
Standard of Learning (SOL) 5.15

Strand: Probability and Statistics

Standard of Learning (SOL) 5.15

The student will determine the probability of an outcome by constructing a sample space or using the Fundamental (Basic) Counting Principle.

Grade Level Skills:

- Construct a sample space, using a tree diagram to identify all possible outcomes.
- Construct a sample space, using a list or chart to represent all possible outcomes.
- Determine the probability of an outcome by constructing a sample space. The sample space will have a total of 24 or fewer equally likely possible outcomes.
- Determine the number of possible outcomes by using the Fundamental (Basic) Counting Principle.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [5.15 How many ways?](#)
- VDOE Co-Teaching Mathematics Instruction Plans (MIPS)
 - [5.15 Fundamental Counting Principle](#)
- VDOE Algebra Readiness Remediation Plans
 - [Number Cubes](#)
 - [Outfit Options](#)
 - [Rock Paper Scissors](#)
- VDOE Word Wall Cards: Grade 5 ([Word](#) and [PDF](#))
 - Fundamental Counting Principle

Supporting and Prerequisite SOL: [4.13a](#), [4.13b](#), [4.13c](#), [3.14](#)

SOL 5.15 - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

An ice cream shop offers the choices of:

- a cup or a cone
- vanilla, chocolate, or strawberry ice cream
- sprinkles, whipped cream, or hot fudge toppings

1) Make a list or chart of the possible choices offered by the ice cream shop.

*A student may miss some possibilities by only listing the combinations with either the cup or cone or just select one flavor and topping for each. A student may double count some of them if they are not systematic in making the list. Teachers may wish to encourage students to use a method that will assist them in keeping track of what they are listing rather than skipping around with choices. Teachers may benefit from using the VDOE Algebra Readiness Remediation Plan titled *Outfit Options* with students who may need additional support with creating lists.*

2) Create a tree diagram of the possible ice cream choices.

A student may create a separate tree for each possibility, rather than one tree branching out to each choice. A student may also have their branches coming from the middle of a choice instead of each one:



*Students should be encouraged to check that each choice should have branches extending from it to show the next set of possible outcomes. It may also be beneficial for students to verbalize each possible selection as they are creating the tree diagram to help make sense of it. Teachers may benefit from using the VDOE Algebra Readiness Remediation Plan titled *Outfit Options* with students who may need additional support with creating tree diagrams.*

3) What is the probability of a customer choosing a cup of vanilla ice cream with sprinkles?

This is the most specific probability with just one option out of 18 total options. A student may miss one or more parts of it. They may only look at sprinkles and count each with sprinkles. Students can be shown a strategy such as highlighting, underlining, or circling each of the choices mentioned in the question and then also in the list or tree diagram.

4) Use the Fundamental Counting Principle to prove you have found all possible outcomes.

*A student may only multiply two of the three numbers involved. They may also add the numbers of choices instead of multiply. This may indicate that they haven't conceptualized the fundamental counting principle. One method is to have students write the number the choices under each section of the tree so they can visualize the connection between $2 \times 3 \times 3$ and the tree diagram. They can also number the combinations at the end of the branches to check their work. Teachers may benefit from using the VDOE Mathematics Instructional Plan titled *Fundamental Counting Principle* with students who may need additional support.*