

KEY

Sample Spaces for Compound Events



Objective

In this lesson, you will

Listing Possible Outcomes

A _____ event is a result from a set of single outcomes.



A _____ event is a combination of two or more simple events or a result of a set of multiple outcomes.

Let's look at a few events to determine if they are simple or compound.

Event	Simple	Compound
draw one card from a deck of cards		
draw a card multiple times from a deck of cards		
toss one coin that lands on heads		
toss more than one coin at the same time and producing all heads		

One way to find a **sample space** for a compound event is to make an organized _____ of all possible _____.

Example: Walter has a **penny**, a **nickel**, and a **dime** in his pocket. He removes one of the three coins at random, places it back in his pocket, and then randomly chooses another coin.

We can find all possible outcomes by making a list. Let's organize our list by the coin that he could pick _____.




Walter picked a nickel first. The _____ time he could pick a _____, penny, or a nickel.

First Pick – Second Pick	Possible Outcomes
	Nickel ----- _____
	Nickel ----- _____
	Nickel ----- _____

Next, Walter picked a dime first. The _____ time he could pick a nickel, _____, or a dime.

First Pick – Second Pick	Possible Outcomes
	Dime ----- _____
	Dime ----- _____
	Dime ----- _____

Last, Walter picked a penny first. The second time he could pick a nickel, dime, or a _____.

First Pick – Second Pick	Possible Outcomes
	Penny ----- _____
	Penny ----- _____
	Penny ----- _____

So, there are _____ possible outcomes in the **sample space**.

nickel-dime, nickel-penny, nickel-nickel,
 dime-nickel, dime-penny, dime-dime,
 penny-nickel, penny-dime, penny-penny

Good practices of listing ALL possible outcomes:

- ❖ Use _____ to represent the possible outcomes.
- ❖ Fix the outcome of the _____ event.
 - Pair this outcome with EACH of the possible outcomes of the _____ event.

Question

Suppose Jennifer wants to create an outfit from a collection of three shirts and three pairs of pants. Her shirts are pink, red, and yellow, and her pants are white, black, and gray. How many outfits can she create from these items?



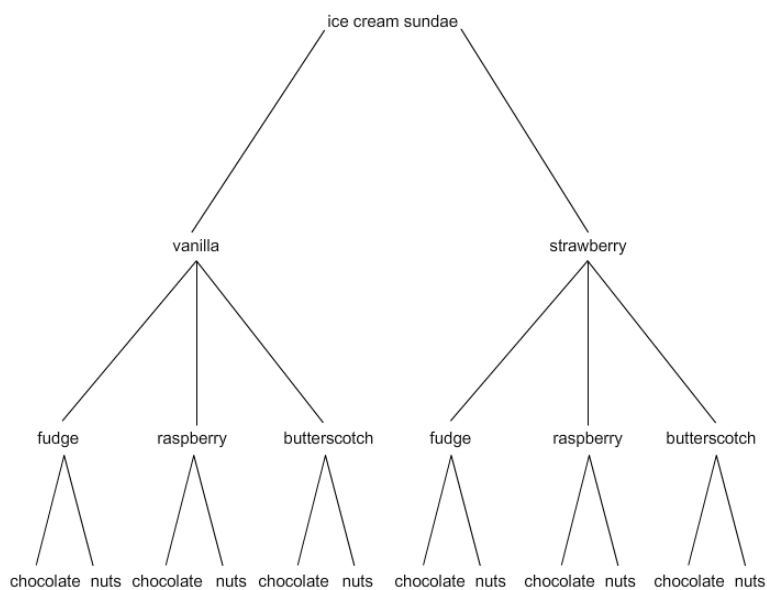
P-W	R-W	Y-_____
P-B	R-_____	Y-B
P-_____	R-G	Y-G

So, Jennifer can make _____ total outfits.

Possible Outcomes from Tree Diagrams

Another method for representing a **sample space** for a compound event is creating a _____.

Example: Suppose you want to make an ice cream sundae. You have two flavors of ice cream (vanilla and strawberry), three kinds of syrup (fudge, raspberry, and butterscotch), and two toppings (chocolate chips and nuts).



- ❖ First, choose the ice cream flavor, vanilla or _____.
- ❖ The first outcome is fixed. Add the three syrups to each flavor: fudge, raspberry, and butterscotch.
- ❖ Finally, each outcome can have either _____ or nuts. Add these to each outcome.

Use abbreviations to show all possible outcomes.

{V-F-C, V-F-N, V-R-C, V-R-N, V-B-C, V-B-N, S-F-C, S-F-N, S-R-C, S-R-N, S-B-C, S-B-N}

Possible Outcomes from Tables

One more way to represent **sample spaces** is by creating a _____.

Example: James, Harry, and Ronald are equally good at basketball, football, and soccer. Their coaches want to make each of them the captain for one of these three teams. In how many ways can the coach assign captains for the three teams?

		Boys		
		James	Harry	Ronald
Game	basketball	_____	H-B	R-B
	soccer	J-S	_____	R-S
	football	J-F	H-F	_____

So, the total number of possible outcomes, or the sample size, is _____.

Summary

Which method for finding the sample space or total number of outcomes for a compound event works best for you and why?