

Name: _____

Permutation vs. Combination

We've already worked on how to determine the number of possibilities for a given event, on a basic level. Now, we need to look at special cases—specifically, permutations and combinations. The probabilities we have worked on so far have assumed an order (first, roll the die and get a 4. Then, roll it and get an even). This is called a **permutation**, which is a set of compound events where **the order of events matters**. A permutation might be removing cards from a deck one card at a time (not in a group), or playing songs one after the other (not selecting them all at once). The alternative to a permutation is a **combination**. A combination is a set of compound events where **the order does not affect the events**, like choosing shirts to pack for a long trip (not deciding which shirt to wear first, and second, and so on).

Permutation: Order matters (playing, displaying, hanging up, putting in order, etc.)

Combination: Order does not matter (choosing, selecting, grabbing, packing, taking, etc.)

For each set of two events, **one is a permutation and one is a combination**. Determine which is the combination and which is the permutation. Mark the permutation with a **P** and the combination with a **C**.

1. Choosing songs to put on a playlist. _____ <i>(P or C)</i>	Playing songs from a playlist. _____ <i>(P or C)</i>	2. Setting up the batting order in a baseball game. _____ <i>(P or C)</i>	Picking players for a game of baseball. _____ <i>(P or C)</i>
3. Hanging pictures on a wall for display. _____	Deciding on pictures to use for a display. _____	4. Selecting movies to watch. _____	Watching movies. _____
5. Buying candy bars at the store. _____	Eating candy bars one after the other. _____	6. Choosing winners for a \$100, a \$75, and a \$50 gift card. _____	Choosing winners for three \$100 gift cards. _____
7. Buying ingredients for a meal. _____	Adding ingredients to cook a meal. _____	8. Watching TV shows you have recorded. _____	Deciding which shows to record. _____
9. Getting books from the library. _____	Reading books from the library. _____	10. Hanging paintings on the wall. _____	Choosing paintings to hang on the wall. _____
11. Deciding what to wear each day of a vacation. _____	Packing clothes for a long vacation. _____	12. Awarding first, second, and third place winners. _____	Awarding the three best players. _____
13. Arranging chairs in a room. _____	Buying chairs to arrange in a room. _____	14. Choosing flavors of ice cream for a sundae. _____	Building an ice cream cone with different flavors. _____
15. Choosing five people to give presentations. _____	Calling up five presenters one at a time. _____	16. Writing names on an event's program. _____	Collecting names to put on an event's program. _____
17. Designing a seating chart for a wedding. _____	Choosing people to invite to a wedding. _____	18. Planning meals for every day of the week. _____	Buying food to make meals for the week. _____
19. Putting homework into a backpack. _____	Getting all of your homework done. _____	20. Choosing clothes to put on display mannequins. _____	Dressing mannequins for a display window. _____