

Probability P1: Counting

At the deli, we make sandwiches.

We have 5 types of bread, 6 types of meat, 4 types of cheese, and a choice of chips or a pickle. How many ways are there to order:

- 1) a sandwich with a pickle?
- 2) a roast beef sandwich?
- 3) a sandwich on wheat bread?

You are picking a 4 character password. How many ways are there to make a password made up of:

- 4) 4 letters
- 5) 4 digits (the first digit CAN NOT be 0)
- 6) 2 letters and 2 digits
- 7) 4 letters with no repeats

Find:

- | | | |
|------------------|---------------|---------------|
| 8) ${}_{10}P_4$ | 9) ${}_6P_3$ | 10) ${}_4P_4$ |
| 11) ${}_{10}C_4$ | 12) ${}_6C_3$ | 13) ${}_4C_4$ |

Find the number of possible outcomes for the following situations:

- 14) The gold medalist, silver medalist, and bronze medalist in a group of 10 runners
- 15) Arranging 6 mannequins in a store window
- 16) Drawing 5 cards from a standard poker deck of cards
- 17) Visiting 10 states in the US during a vacation
- 18) Picking 2 volunteers to "see if it's safe" out of 12 people
- 19) Picking 4 people to swim a medley race (4 different strokes in a set order) from a team of 9
- 20) Picking 10 songs for a mix tape from 25 songs