1. Justine is a wedding coordinator. She is selecting the menu options for the reception.
    *   First, she will give the guests a choice of Salad or Soup for the first course.
    *   Then, she will allow them to pick from a chicken, steak, or a vegetarian for their main course.
    *   Finally, she will allow the guests to choose bride's vanilla cake or groom's chocolate cake.
    Create a tree diagram showing every plausible dinner a guest could select:

    How many outcomes are possible?

    Show how you could use the counting principle to determine the number of outcomes.

2. At a New Car Dealership, a particular model comes in 4 different trim levels (CX, DX, EX, and Si). The same model comes in 5 different colors (Night Black, Pearl White, Evening Blue, Sandy Red, and Forest Green). The model of car also has 3 different interior options (Grey Cloth, Tan Cloth, Black Leather). How many different versions of this model can be created from these options?

3. A seven digit telephone number is of the form ABC-DEFG. In one particular state, the digit 'A' is restricted to any number between 1 and 9. The digits B and C are restricted to any number between 2 and 9. The digits D,E,F, and G have no restriction. How many seven digit phone numbers are possible with these restrictions?

4. A ten digit telephone number is of the form (XYZ) – ABC –DEFG. In one particular state, there are 4 possible area codes (202, 341, 602, and 581). The digit 'A' is restricted to a number 2 through 8.   The digits B and C can be any number but they cannot repeat. The digits D,E,F, and G have no restriction. How many seven digit phone numbers are possible with these restrictions?

5. How many area codes of the form (XYZ) are possible if the digit 'X' and 'Y' can be any number 1 through 9 and the digit 'Z' can be any number 2 through 9?

6. A seven digit telephone number is of the form ABC-DEFG. In one particular state, the digit 'A' can be any digit except 0 and 1. The digits B and C can be any digit from 2 - 9. The digits D, E, F, and G can be any digit 0 – 9 except they can't all be the same (e.g. 0000, 1111, 2222, ….etc.). How many seven digit phone numbers are possible with these restrictions?

7. A student number for a high school requires that student identification number consist of 6 characters. The first 4 characters can be any number without restriction. The last 2 characters are letters and cannot repeat. How many student ID's are possible?

8. A lock on a fence door has a 3 digit combination. Each digit can be any number between 1 – 8. The only restriction is that all 4 characters cannot be the same (e.g. 111, 222, 333, etc.). How many combinations are possible?

9. A suitcase has a lock on it consisting of four numbers. Each number could be any number 0-9. The only restriction is that two numbers in a row cannot be the same (e.g. you couldn't use 3224 because the 2's are adjacent but you could use 3434 since none of the same numbers are adjacent).