Permutations and Combinations: Takeaways

Concepts

- If we have an experiment (like flipping a coin) with **a** outcomes, followed by an experiment (like rolling a dice) with **b** outcomes, then the total number of outcomes for the composite experiment can be found by multiplying **a** with **b**. This is known as the **rule of product**.

- If we have an experiment with **a** outcomes, followed by an experiment with **b** outcomes, followed by an experiment with **n** outcomes, the total number of outcomes for the composite experiment can be found by calculating the product of their individual outcomes:

- There are two kinds of arrangements:
    - Arrangements where the order matters, which we call **permutations**.
    - Arrangements where the order doesn't matter, which we call **combinations**.
- To find the number of permutations when we're sampling with replacement, we can use the formula:

- To find the number of permutations when we're sampling without replacement and taking only objects from a group of objects, we can use the formula:

- To find the number of combinations when we're sampling without replacement and taking only objects from a group of objects, we can use the formula:

Resources

- A tutorial on sampling with replacement, which we haven't covered in this mission

- An easy-to-digest introduction to permutations and combinations