1. Suppose that a group of potential pet food customers were surveyed on the type of pet they owned (factor A). Individuals had either cats or dogs. Then, individuals were asked about their purchasing preferences for pet food (factor B). Specifically, cat owners were only asked about *cat foods* produced by Brands X, Y, and Z. Dog owners were only asked about *dog foods* produced by brands X, Y, and Z.

   Factors A and B are...

   - Crossed
   - Nested.

2. Researchers designed an experiment to study factors affecting the particle size in the production of polyvinyl chloride (PVC) plastic. In the experiment, three operators (Factor A, levels X, Y, and Z) used eight different devices called resin railcars (Factor B, levels 1-8) to produce PVC. There were 24 total particle size measurements in the study.

   - This experiment is balanced.
   - This experiment is unbalanced.
   - There is not enough information to conclude that the experiment is balanced or unbalanced.

3. Researchers designed an experiment to study factors affecting the particle size in the production of polyvinyl chloride (PVC) plastic. In the experiment, three operators (Factor A, levels X, Y, and Z) used eight different devices called resin railcars (Factor B, levels 1-8) to produce PVC. There were 24 total particle size measurements in the study.

   Suppose that, for resin railcar 1, operator X produces a larger particle size than operator Y, but a lower particle size for resin railcar 2. This is an example of...

   - an interaction between Factor A and Factor B.
   - An interaction between Factor A and particle size.
   - An interaction between Factor B and particle size.
   - a balanced design.
   - an unbalanced design.

4. Researchers designed an experiment to study factors affecting the particle size in the production of polyvinyl chloride (PVC) plastic. In the experiment, three operators (Factor A, levels X, Y, and Z) used eight different devices called resin railcars (Factor B, levels 1-8) to produce PVC. There were 24 total particle size measurements in the study. However, there was no measurement of particle size for operator Y and resin railcar 3.

   - This experiment is unbalanced.
   - This experiment is balanced.
   - This experiment contains replication.
   - This experiment contains the same number of replications for each factor level combination.

5. Suppose that a group of potential pet food customers were surveyed on the type of pet they owned (factor A). Individuals had either cats or dogs. Then, individuals were asked about their purchasing preferences for pet food (factor B). Specifically, cat owners were only asked about cat foods produced by Brands X, Y, and Z. Dog owners were only asked about dog foods produced by those same brands.

   This study can be analyzed using a two-way ANOVA model because...

   - There were two participants in the study.
   - Factor B has two levels.
   - Factor A has two levels.
   - There are two factors.