GENERAL BOTANY Special Lecture - Scientific method and classification of life

I. **Scientific method**
- A. **Ask a question - identify the problem**
- B. **Make a hypothesis - induction (sort through criteria)**
- C. **Predict what will happen - deduction**
- D. **Test the deduction**
- E. **Repeat the test**
- F. **Make a conclusion**
- G. **Examine alternative hypotheses**

II. **Scientific reports**
- A. **Title**
- B. **Introduction**
- C. **Materials and methods**
- D. **Results and discussion**
- E. **Literature cited**

III. **Theory of natural selection (Charles Darwin)**
- A. **More offspring are produced than can survive to the reproductive age**
- B. **Populations vary - variation is heritable**
- C. **Heritable traits improve chances of survival**
- D. **Varied traits under the right conditions favor reproduction (differential reproduction)**
- E. **Natural selection is the result of differential reproduction**

IV. **Classification of life - phylogenetic (natural) system**
- A. **Based on lines of decent (evolution)**
- B. **Classification**
  1. **Kingdom**
  2. **Phylum (previously Division)**
  3. **Class**
  4. **Order**
  5. **Family**
  6. **Genus**
  7. **Species**

  King Philip Crossed Over From George's Swamp

- C. **Examples:**
  1. **Dog: Animalia, Chordata, Mammalia, Carnivora, Canidae, Canis familiaris**
  2. **Man: Animalia, Chordata, Mammalia, Primates, Hominidae, Homo sapiens**
  3. **Redbud tree: Plantae, Anthophyta / Magnoliphyta (flowering), Magnoliopsida (dicot), Rosales (roses), Leguminosae (legume), Cercis canadensis**
- D. **The six (previously five) kingdoms**
  1. **Monera (bacteria) – MONERA (ARCHAEA and BACTERIA)**
  2. **Protista (single-celled eukaryotes, including most algae) - PROTISTA**
  3. **Fungi (fungi, including mushrooms) - MYCOTA**
  4. **Plantae (plants) - PLANTAE**
  5. **Animalia (animals) - ANIMAILIA**