# Database Design Steps

(See Database Design notes for more details)

Goals: Databases that:

* Adaptable; fields and tables can be added easily
* Flexible; data can be retrieved in unlimited number of ways
* Accurate; no data redundancy, fields limit data entry where possible

1. Fact Finding
   1. Determine fields required for database
   2. Make sure there aren’t multi-part fields
2. Name Tables
   1. Using simple nouns. Use plural or singular for all entity names (don’t mix singular and plural)
3. Draw Entity Relationship diagram
4. Determine Primary Keys for Each Entity
   * + Keys uniquely describe each record of a table
5. Resolve Many-to-Many Relationships
   1. Insert new entity between parents
   2. Name new entity
      * One instance of parent1 + one instance of parent2 is called what?
   3. Re-evaluate cardinality
      * Probably 1------M [ ] M--------1
   4. Determine keys for new entity
      * Probably keys from both parents
6. Determine Foreign Keys (Linking Fields)
   * + For each child entity (many side of a relationship), ensure the key from its parent(s) has been copied to the child.
7. Remove calculated fields and constants
   1. Make a separate list of calculated fields and equations used to calculate them
   2. Ensure data required to generate calculated fields is available in the field list
   3. Required data can be combined from multiple tables
   4. Constants are fields whose value is the same for all records
8. Name and assign fields (non-key) attributes to appropriate table
   1. Assign to only one table (no redundancy)
   2. Linking fields must be redundant
9. For all fields, determine type and size
   1. Consider specifying value ranges and default values as well
   2. Designate logical keys
   3. Create sample records
10. Ensure no data redundancy except for linking fields.
    * + Watch for synonyms, fields with different (though similar) names