1. Identify possible entities and relationships.
2. Draw a draft entity relationship diagram (ERD).
3. Resolve ‘one-to-one’ and ‘many-to-many’ relationships, and check for further entities and relationships.
4. Remove redundant relationships.
5. Check optionality of relationships. (6) Draw your final entity relationship diagram (ERD).

**Exercise 1:** Factory system: A worker can produce many kinds of component. A component can be constructed from several raw materials. A single worker produces each component.

**Exercise 2:** Medical practice: Each GP may (by appointment only) see many patients; each patient is registered with only one practice. A GP can be identified by their Medical Council Number, and a patient by their Patient Number.

**Exercise 3:** United Broke Artists United Broke Artists (UBA) is a broker for not-so-famous artists. UBA maintains a small database to track painters, paintings and galleries. A painting is created by a particular artist and then exhibited in a particular gallery. A gallery can exhibit many paintings, but each painting can be exhibited in only one gallery. Similarly, a painting is created by a single painter, but each painter can create many paintings.

**Exercise 4:** Public lending library system: A public library lends copies of books to its borrowers. The library may have more than one copy of the same book. Each copy will have a different accession number which is used to identify that copy. A borrower can reserve a book if there are no copies of the book available because they are all on loan. Question: Can you amend your diagram to consider the case of keeping records of completed loans?

**Exercise 5:** Shoe shop sales and inventory system A company operates several branches of shoe shops. Various styles of shoes are stocked in different quantities by the branches. Details of stock and weekly sales for each branch are recorded by the stock control system. The company keeps records of sales from previous weeks to help it identify sales trends. Weekly picking lists are produced to request replacement stock for each branch. Each picking list identifies the style, size and quantity of each of the shoes required. Question: Is a picking list an entity – if not, why not?