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STUDY QUESTIONS FOR STEP 3

1. What is the function of the "Design Process"?

The "Design Process" is a systematic procedure used in industry to change ideas into useable products for consumers or other manufacturers. This procedure is used by designers, engineers, architects, technicians, drafters, detailers and illustrators to prepare a set of plans and specifications that guide machinists, welders, sheet metal workers, casting and molding operators, electronic technicians, painters and many other skilled workers in the completion of their work.

2. List in your own word the ten (10) steps involved in the design of a product or a structure:

1. Identify, analyze and research the problem to obtain a complete description of the project;
2. Think of possible solutions to the problem and make freehand, multiview and/or pictorial sketches of all ideas for solving the problem;
3. Discuss all ideas with other designers, engineers, supervisors and managers;
4. Revise and combine ideas after discussions into a "final" solution sketch;
5. Prepare a design layout drawing to scale from the final solution sketch;
6. Prepare scale detail and assembly drawings of all parts and sub-assemblies;
7. Prepare complete specifications and a materials list of all parts;
8. Make individual parts, inspect parts for accuracy, and assemble the parts to make a working prototype or scale model;
9. Check assembly of parts and test the operation of the prototype for accuracy, reliability, and safety.
10. Revise detail and assembly drawings if necessary and prepare technical illustrations for manuals and brochures.

3. What is the "designer's" role in the "Design Process"?

To guide and make sure the machinists, welders, sheet metal workers, casting and molding operators, electronic technicians, painters and many other skilled workers can read their work.

4. What is the "engineer's" role in the "Design Process"?

- Highly trained in mathematics and sciences with emphasis in one of the following areas: architectural, mechanical, civil, electrical, industrial, structural, chemical, etc.
- Works with other designers to make an idea work; selects materials, production methods and prepares final layout drawing of the final design;
- Four years of college training in Engineering plus 3 to 5 years of work experience to become a Professional Engineer

5. What is the "technician's" role in the "Design Process"?

- Highly trained in practical aspects of engineering, manufacturing procedures and technical drawing/CAD principles;
- Works with engineers, drafters and tradesmen in the assembly and testing of prototypes;
- Minimum of two years of college training in technology fields.

6. What is the "drafter's or detailer's" role in the "Design Process"?

To make the original drawings detailed

7. What is the "illustrator's" role in the "Design Process"?

- Highly skilled in pictorial (three dimensional) drawing/CAD skills, and able to visualize the shape of objects from two dimensional drawings;
- Works from detail drawings of individual parts and assembly drawings of how parts fit together to prepare three dimensional drawings for owner's manuals, repair instructions, assembly instruction sheets, brochures, charts, graphs, etc.;
- Three or four courses of high school drawing and art plus a minimum of two years of post high school training and three to five years of work experience or a four year degree in commercial art.

8. What is the "architect's" role in the "Design Process"?

- Highly creative individual with a background in planning, design and construction with an emphasis on aesthetic appearance of structure;

- Works with other architects, engineers and contractors in the design and construction of structures; five years of college training plus two to five years of work experience to become a licensed architect.

9. A beginning drafter or cad operator is called **Novice** and can be promoted to **Apprentice** and **Designer**.

10. What is the purpose of a "Design Project Statement"?

The "statement of problem" is the first phase of the first step of the Design Process. The purpose of this phase is to describe the general considerations of the problem without indicating a solution. The statement must address five (5) general concerns: what, who, why, where and when.

11. What is the purpose of a "Design Project Analysis"?

Answers to the questions you have to ask in order to design something.