Employment Opportunities in CADD

Unit: Computer-Aided Drafting and Design (CADD)
Problem Area: Introduce CADD
Lesson: Employment Opportunities in CADD

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. List some of the different types of drafting occupations.
2. Explain how to become a drafter.
3. Identify the levels of advancement for drafters.
4. Explore employment opportunities in drafting.

List of Resources. The following resources may be useful in teaching this lesson:


List of Equipment, Tools, Supplies, and Facilities

- Overhead or PowerPoint projector
- Visual(s) from accompanying master(s)
- Copies of sample test, lab sheet(s), and/or other items designed for duplication
- Materials listed on duplicated items
- Computers with printers and Internet access
- Classroom resource and reference materials

Terms. The following terms are presented in this lesson (shown in bold italics):

- aeronautical drafter
- architectural drafter
- civil drafter
- drafter
- electrical drafter
- electronic drafter
- mechanical drafter

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situation. A possible approach is included here.

Traditionally, drafters sat at drawing boards and used pencils, compasses, protractors, T-squares, and other drafting tools to manually prepare drawings. Nowadays, most drafters use computer-aided design and drafting (CADD) systems to create drawings. Consequently, drafters are now sometimes referred to as CADD operators or CADD technicians. But, whatever they are called, they still function as drafters and need to possess the knowledge and skills of traditional drafters, as well as CADD skills. How does a person become a drafter? What kind of education, training, and know-how are required? What kinds of employment opportunities are available to someone who is interested in making a career in drafting?
SUMMARY OF CONTENT AND TEACHING STRATEGIES

Objective 1: List some of the different types of drafting occupations.

Anticipated Problem: What are some of the different types of drafting occupations?

I. The types of drafting occupations fall into three general categories: architecture, engineering, and manufacturing. Further classifications are made according to type of drafting, such as aeronautical, architectural, civil, electrical, electronic, or mechanical.

A. Aeronautical drafter
   1. Prepares engineering drawings of aircraft planned by aeronautical engineers
   2. Specializes in drawings of developmental or production airplanes and missiles and ancillary equipment, such as launch mechanisms and scale models of prototype aircraft.

B. Architectural drafter
   1. Draws artistic architectural and structural features of all types of buildings and structures
   2. Verifies compliance with building codes
   3. May specialize in planning architectural details according to the building materials used

C. Civil drafter
   1. Prepares detailed construction drawings and topographic profiles used in the planning and construction of highways, bridges, and other civil engineering projects
   2. Drafts detailed drawings of installations such as culverts, dikes, wharfs, and breakwaters
   3. Prepares graphs and hauling diagrams used in earth-moving operations

D. Electrical drafter
   1. Prepares working drawings used by construction and repair crews that erect, install, and repair electrical equipment
   2. Prepares wiring diagrams used in wiring communications centers, power plants, industrial establishments, electrical distribution systems, and commercial and domestic buildings

E. Electronic drafter
   1. Drafts schematics, layouts, and wiring diagrams used in the manufacture, assembly, installation, and repair of electronic equipment, such as computers, television cameras, and radio transmitters.
   2. Prepares detailed drawings of racks, panels, and enclosures
3. May prepare charts and maps related to television and radio surveys

F. **Mechanical drafter**
   1. Prepares detailed working drawings of machinery and mechanical devices
   2. Drafts multiview assembly and subassembly drawings needed for the manufacture and repair of mechanisms

*Many techniques can be used to help students master this objective. Refer to Figures 1.3 and 1.5 through 1.9 in Engineering Drawing & Design, 4th ed., to illustrate different types of drafting. Use VM–A to review some of the types of drafting occupations.*

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**Objective 2:** Explain how to become a drafter.

**Anticipated Problem:** What skills and training are needed to become a drafter?

II. A **drafter** prepares technical drawings and plans used by production and construction workers to build everything from manufactured products to commercial and residential structures. A person considering a career in drafting should possess both mechanical and visual aptitude. He or she should also have specialized training in design and drafting.

A. **Aptitude**
   1. A drafter should be mechanically minded and should be able to visualize what is to be drawn.
   2. He or she needs to be willing to work in cross-functional teams, learn new concepts, and adjust to changing work conditions.
   3. A drafter also should be detail oriented, and his or her work should be neat and accurate.

B. **Training**
   1. Nowadays, most industries fill their drafting openings with graduates who have completed specialized training in drafting and design from junior or community colleges, technical institutes, and vocational schools.
   2. The specialized training should include:
      a. Basic and advanced drawing
      b. Mathematics (geometry, algebra, trigonometry)
      c. Physics or chemistry
      d. Humanities
      e. English
      f. Technology courses
      g. Courses in specific fields, such as aeronautics, architecture, cartography, electronics, and sheet metal drafting
   3. Training in computer-aided drafting (CAD) is also essential for today’s job market.
Objective 3: Identify the levels of advancement for drafters.

Anticipated Problem: Are there any opportunities for advancement in the drafting industry?

III. Several levels of advancement are available for drafters, based on educational background and practical experience.

A. To qualify for advancement, most companies require drafters to have a two-year college or trade school degree or an equivalent or greater amount of practical experience in a specific area.

B. The general classifications for the occupation of drafter are:
   1. Entry-level or junior drafter, who performs routine tasks under close supervision
   2. Intermediate-level drafter, who, after gaining experience, advances to more difficult work with less supervision
   3. Senior drafter
   4. Designer
   5. Supervisor

C. With continuing education (which many companies will often pay for) and the appropriate college degrees or experience, a drafter may go on to become an architect, engineer, or engineering technician.

Objective 4: Explore employment opportunities in drafting.

Anticipated Problem: What types of drafting jobs are available?

IV. The types of drafting jobs available at any given time depend on national and local economies. This is consistent with most other types of employment in industry and construction.

A. Drafting is tied closely to construction and manufacturing, so that a nationwide and/or local downturn or upturn in these industries affects the number of drafting jobs available.

B. Public and private indicators suggest that the demand for drafters with two-year college or trade school degrees will continue to be strong.

C. The types of drafting jobs available differ from area to area. Many mechanical drafting jobs are generally found in metropolitan areas where manufacturing is
abundant, while outlying areas usually feature more structural or civil drafting jobs. Every local area has a need for more of one type of drafting skill than another.

D. Opportunities for advancement in drafting are usually excellent, depending on the advancement possibilities of the specific employer. Advancement also depends on the individual drafter’s initiative, ability, product knowledge, and willingness to participate in continuing education. Drafting has traditionally been an excellent steppingstone to careers in engineering, design, and management.

Many techniques can be used to help students master this objective. Use VM–D to emphasize what to look for in a drafting curriculum program. Use LS–A to allow students to search the Internet for drafting jobs.

- **Review/Summary.** Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at the ends of chapters in the textbook may also be used in the review/summary.

- **Application.** Use the included visual masters and lab sheet to apply the information presented in the lesson.

- **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

- **Answers to Sample Test:**

  **Part One: Multiple Choice**
  
  1. d
  2. a
  3. d
  4. b
  5. d
  6. c

  **Part Two: True or False**
  
  1. F
  2. T
  3. F
  4. T
  5. T
  6. F
Part Three: Short Answer

1. mechanical and visual aptitude; willingness to work in cross-functional teams, learn new concepts, and adjust to varying work conditions; detail oriented, neat, and accurate

2. To become a drafter, you need specialized training in the following areas:
   a. Basic and advanced drawing
   b. Mathematics (geometry, algebra, trigonometry)
   c. Physics or chemistry
   d. Humanities
   e. English
   f. Technology courses
   g. Courses in specific fields, such as aeronautics, architecture, cartography, electronics, and sheet metal drafting
   h. Computer-aided drafting (CAD)
Employment Opportunities in CADD

Part One: Multiple Choice

Instructions: Write the letter of the correct answer.

1. A(n) _____ prepares technical drawings and plans used by production and construction workers to build everything from manufactured products to commercial and residential structures.
   a. Designer
   b. Supervisor
   c. Illustrator
   d. Drafter

2. Which of the following prepares detailed construction drawings and topographic profiles used in the planning and construction of highways and bridges?
   a. Civil drafter
   b. Architectural drafter
   c. Topographic drafter
   d. None of the above

3. Which of the following is not a general classification for the occupation of drafter?
   a. Senior drafter
   b. Intermediate-level drafter
   c. Designer
   d. Architect
4. A(n) _____ prepares engineering drawings of aircraft.
   a. Electronic drafter
   b. Aeronautical drafter
   c. Mechanical drafter
   d. Electrical drafter

5. A person considering a career in drafting should have specialized training in:
   a. Basic and advanced drawing
   b. Computer-aided drafting (CAD)
   c. Trigonometry
   d. All of the above

6. Which of the following draws structural features of all types of buildings and structures?
   a. Civil drafter
   b. Structural drafter
   c. Architectural drafter
   d. Aeronautical drafter

► Part Two: True or False

Instructions: Write T for true or F for false.

1. Drafting has traditionally been a hindrance to careers in engineering, design, and management.
2. Public and private indicators suggest that the demand for drafters with two-year college or trade school degrees will continue to be strong.
3. To qualify for advancement, most companies require drafters to complete a four-year college degree.
4. Accuracy and neatness are essential characteristics of a drafter’s work.
5. A civil drafter prepares graphs and hauling diagrams used in earth-moving operations.
6. The types of drafting jobs available at any given time depend on state and federal government.

► Part Three: Short Answer

Instructions: Complete the following.

1. What skills should you have if you are considering drafting as a career?

2. What kind of training do you need?
DRAFTING OCCUPATIONS

- Aeronautical drafter
- Architectural drafter
- Civil drafter
- Electrical drafter
- Electronic drafter
- Mechanical drafter
HOW TO BECOME A DRAFTER

♦ **Aptitude**

- Mechanical and visual
- Willing to work in cross-functional teams, learn new concepts, and adjust to changing work conditions
- Detail oriented, neat, and accurate

♦ **Training**

- Basic and advanced drawing
- Mathematics (geometry, algebra, trigonometry)
- Physics or chemistry
- Humanities
- English
- Technology courses
- Courses in specific fields, such as aeronautics, architecture, cartography, electronics, and sheet metal drafting
- Computer-aided drafting (CAD)
DRAFTING ADVANCEMENT LEVELS

- Entry-level or junior drafter
- Intermediate-level drafter
- Senior drafter
- Designer
- Supervisor
When choosing a school, look into curriculum, placement potential, and local demand.

- Drafting curriculums in certain geographical areas often specialize in the types of drafting that will fill local employment needs.

- Some drafting programs offer a broader curriculum so that graduates are not limited in their employment opportunities.

- Talk to representatives of local industries to get an objective evaluation of a nearby school’s curriculum.
Drafting Jobs on the Internet

Purpose

The purpose of this activity is to practice looking for employment opportunities on the Internet.

Objectives

1. Using the Internet, research employment opportunities in drafting.

2. Select three entry-level positions that you wish to apply for and list the employer, job title, qualifications, responsibilities, and salary for each position.

Materials

♦ lab sheet
♦ writing utensil

Procedure

1. In recent years, the Internet has become a good place to look for employment opportunities in any field. Many Web sites allow you to post your résumé and apply for current job openings.

2. Using the following Web sites, select three entry-level positions in drafting for which you wish to apply.
   a. CareerOneStop (http://www.careeronestop.org)
   c. Jobweb (http://www.jobweb.com)
   d. Best Jobs USA (http://www.bestjobsusa.com)
3. Provide the following information for each position:
   a. Employer
   b. Job title
   c. Qualifications
   d. Responsibilities
   e. Salary

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