Explore the Roles of Designers

Unit: Historical Perspectives of the Drafting and Design Field Industry

Problem Area: Historical Roles of Drafters, Designers, Engineers, and Architects

Lesson: Explore the Roles of Designers

Student Learning Objectives.

Instruction in this lesson should result in students achieving the following objectives:

1. **Describe the roles of a designer.**
2. **Explain the historical and societal influences of designers, architects, and engineers on daily life.**
3. **Identify career possibilities related to the design field.**

List of Resources.

The following resources may be useful in teaching this lesson:

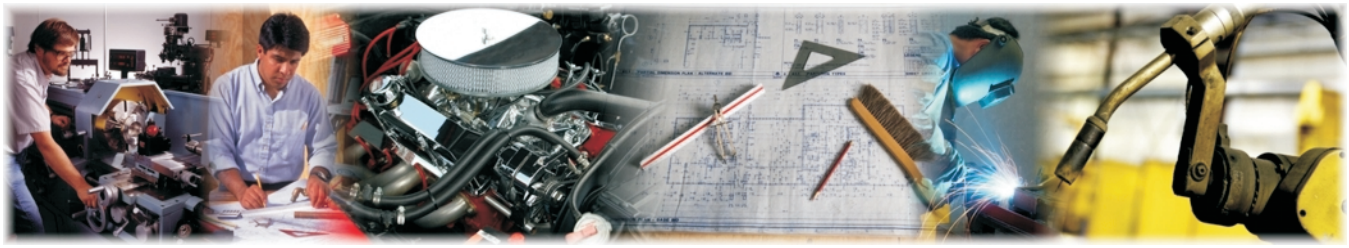
American Design Drafting Association Web site. Accessed March 1, 2008. <www.adda.org>.

American Institute of Architects Web site. Accessed March 1, 2008. <www.aia.org>.

Brown, Walter C., and Kicklighter, Cloise E. *Drafting for Industry.* Goodheart-Wilcox, 1995.

Kicklighter, Cloise E. *Architecture: Residential Drawing and Design*. Goodheart-Wilcox, 2005.

Occupational Information Network Web site. Accessed on March 3, 2008. <http://online.onetcenter.org/>.



U.S. Department of Labor. *Occupational Outlook Handbook*. Accessed on March 4, 2008. <www.bls.gov/oco/>.

Walker, John R., and Bernard D. Mathis. *Exploring Drafting.* Goodheart-Wilcox, 2007.

Wohler, Terry. *Applying AutoCad 2008.* Glencoe/McGraw-Hill, 2008.

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):

- ➤ Commercial/industrial designers
- ➤ design/engineering technicians
- ➤ designers
- ➤ fashion designers
- ➤ floral designers
- ➤ graphic designers/digital technicians
- ➤ industrial designers
- ➤ interior designers
- ➤ residential /architectural designers
- ➤ technical illustrators

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.

> *Ask students to identify items in the room that have been designed before being manufactured or produced. Create a list (i.e., desk, stapler, and overhead projector).*

> *Ask students to identify items in the room that were not designed before being manufactured or produced. Create a list (i.e., people, animals, and plants).*

SUMMARY OF CONTENT AND TEACHING STRATEGIES

Objective 1: Describe the roles of a designer.

Anticipated Problem: What knowledge, skills, and abilities does a designer possess?

I. Knowledge, skills, abilities, and tasks

A. Design knowledge

1. Design techniques, tools, and principles are involved in the production of precision technical plans, blueprints, drawings, and models.
2. Engineering and technology—These fields involve the practical application of engineering science and technology.
3. Mathematics—Arithmetic, algebra, geometry, calculus, statistics, and their applications are essential for these careers.
4. English language—The structure and content of the English language (including the meaning and spelling of words and the rules of composition and grammar) are essential for clear communication in this field.
5. Production and processing—This involves the raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
6. Customer and personal service—This involves the principles and processes for providing customer and personal services.
   a. Customer needs assessment
   b. Meeting quality standards for services
   c. Evaluation of customer satisfaction

B. Design skills

1. Time management—This involves managing one's own time and the time of others.
2. Active listening—This involves giving full attention to what other people say, taking time to understand the points being made, asking questions (as appropriate), and not interrupting at inappropriate times.
3. Reading comprehension—This involves understanding written sentences and paragraphs in work-related documents.
4. Mathematics—This involves using mathematics to solve problems.
5. Judgment and decision making—This requires considering the relative costs and benefits of potential actions, so the most appropriate action(s) will be taken.
6. Writing—This involves communicating effectively in writing as appropriate for the needs of the audience and the purpose of the document.

7. Critical thinking—This involves using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.

C. Design abilities

1. Oral comprehension—This involves the ability to listen to and understand information and ideas presented through spoken words and sentences.
2. Oral expression—This is the ability to communicate information and ideas through speaking so others will understand.
3. Deductive reasoning—This is the ability to apply general rules to specific problems, which will produce sensible answers.
4. Originality—This is the ability to generate unusual or clever ideas about given topics or situations or to develop creative ways to solve problems.
5. Written comprehension—This is the ability to read and understand written information and ideas.
6. Problem sensitivity—This is the ability to tell when something is wrong or is likely to go wrong; it does not involve solving the problem, only recognizing that a problem exists.

D. Design tasks

1. Sketches of ideas should be prepared.
2. Detailed drawings, illustrations, artwork, or blueprints should be prepared using drafting instruments, paints and brushes, or computer-aided design equipment.
3. The fabrication of models or samples should be directed and coordinated.
4. The drafting of working drawings and specification sheets from sketches should be directed and coordinated.
5. By using working models, the drafter/designer should modify and refine designs to conform to customer specifications, production limitations, or changes in design trends.
6. Designs and reports should be presented to customers or design committees for approval. Modifications and requests should be discussed.
7. The feasibility of design ideas (based on factors such as appearance, safety, function, serviceability, budget, production costs/methods, and market characteristics) should be evaluated.
8. It is necessary to read publications, attend showings, and study competing products and design styles and motifs to obtain perspectives and generate design concepts.

Invite a designer to speak to the class in person or via a conference call so students have the opportunity to ask career-related questions to further their knowledge. Consider having students work in groups to contact designers across the country and to interview them over the phone or via email. They can share their findings with the class to expand their career knowledge base.

Objective 2: Explain the historical and societal influences of designers, architects, and engineers on daily life.

Anticipated Problem: What historical and societal influences have designers played in daily life?

II. Historical and societal influences

A. Drafting is one of the oldest documented professions.

B. Drafting processes date back millions of years when primitive man illustrated the walls of caves with depictions of daily life, hunting expeditions, worship, and death.

C. Great changes to the profession are notable during the Egyptian and Chinese Empires, including the development of rice paper. The advent of paper manufacture and other tools used to make drawings more accurate and legible represent the beginning of drafting as we know it today.

D. From the Age of Empires through the Industrial Revolution, drafting saw changes in equipment and precision (i.e., printing and mechanized printing press).

E. The creation of modern electronics and CADD (Computer Aided Drafting and Design) revolutionized the design and product-development industries.

Developing/presenting a timeline may help students visualize the history of design. You may decide to have students research design history individually, create their own timelines, and present their findings to the class.

Objective 3: Identify career possibilities related to the design field.

Anticipated Problem: What careers are associated with the design field?

III. Design careers

A. ***Designers*** and ***commercial/industrial designers*** develop and design manufactured products (e.g., cars, home appliances, and children's toys).

1. Designers combine artistic talent with research on product use, marketing, and materials to create functional and appealing product designs.
2. Most of these occupations require a bachelor's degree (four years of college).
3. According to the Occupational Information Network Web site, the 2006 median wage was $26.23 hourly and $54,560 annually.

B. ***Design/engineering technicians*** use the principles and theories of science, engineering, and mathematics to solve technical problems in research and development, manufacturing, sales, construction, inspection, and maintenance. They assist in design work and often use CADD equipment and software.

1. An associate's degree or a bachelor's degree is often required.

2. According to the Occupational Information Network Web site, the 2006 median wage was $21.09 hourly and $43,870 annually.

C. ***Fashion designers*** create original clothing and accessories that may follow well-established fashion trends or may involve the development of a unique color, pattern, or type of material.
   1. Most of these occupations require training through a vocational school, related on-the-job experience, and/or an associate's degree. Some positions may require a bachelor's degree.
   2. According to the Occupational Information Network Web site, the 2006 median wage was $30.10 hourly and $62,610 annually.

D. ***Floral designers*** conceptualize displays and cut and arrange live, dried, or artificial flowers and foliage.
   1. These occupations usually require a high school diploma and may require some vocational training or job-related course work. In some cases, an associate's degree or a bachelor's degree may be needed.
   2. According to the Occupational Information Network Web site, the 2006 median wage was $10.43 hourly and $21,700 annually.

E. ***Graphic designers/digital technicians*** create graphics to meet specific commercial or promotional needs (e.g., packaging, displays, or logos). They may use a variety of mediums to achieve artistic or decorative effects. These individuals plan, analyze, and create visual solutions to communication problems. They determine the most effective way of getting a message across in print, electronic, and other media using a variety of methods (e.g., color, type, illustration, photography, animation, and various print and layout techniques).
   1. Most of these occupations require a bachelor's degree.
   2. According to the Occupational Information Network Web site, the 2006 median wage was $19.18 hourly and $39,900 annually.

F. ***Interior designers*** conceptualize, plan, and furnish the interiors of residential, commercial, and industrial buildings.
   1. Most occupations require training through a vocational school, related on-the-job experience, and/or an associate's degree. Some require a bachelor's degree.
   2. According to the Occupational Information Network Web site, the 2006 median wage was $20.32 hourly and $42,260 annually.

G. ***Residential/architectural designers*** prepare detailed drawings of designs and plans for buildings and structures according to the specifications provided by an architect.
   1. Most of these occupations require a bachelor's degree and certification by the American Institute of Building Design (AIBD).
   2. According to the Occupational Information Network Web site, the 2006 median wage was $26.23 hourly and $54,560 annually.

H. ***Technical illustrators*** plan, analyze, and create visual solutions in a variety of artistic manners. They work under a multitude of job titles and provide the systematic artistic delivery of a product using a variety of tools and equipment. Technical illustrators decide the most effective method of communicating a message in print, electronic, and other media using a variety of methods (e.g., color, type, illustration, photography, animation, and various print and layout techniques). Additionally, they often create the instructional assembly plans delivered with a consumer purchased product and may create original artwork using any of a wide variety of mediums and techniques, such as painting and sculpture.

1. Most occupations require training through vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.
2. According to the Occupational Information Network Web site, the 2006 median wage was $20.18 hourly and $41,970 annually.

Visit any career-related Web site to highlight the employment demand for the next 10 years. For example, you may review the Occupational Information Network at <http://online.onetcenter.org> or the Occupational Outlook Handbook at <http://www.bls.gov/oco/home.htm>.

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. The anticipated problems in this lesson and textbook questions may be used in the review/summary.

Application.

Use the included visual master 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: True/False

1. T
2. F
3. T
4. F
5. T
6. T
7. T

Part Two: Short Answer

1. Student answers will vary but may include the following design occupations: designers, commercial/industrial designers, design/engineering technicians, fashion designers, floral designers, graphic designers/digital technicians, interior designers, residential designers, architectural designers, and technical illustrators.
2. The chief function of an industrial designer is to simplify and improve the operation and appearance of industrial products.
3. Possible responses include the following: American Design Drafting Association Web site <www.adda.org>, Occupational Information Network Web site <http://online.onetcenter.org/>, and the U.S. Department of Labor's online *Occupational Outlook Handbook* <www.bls.gov/oco/>.
4. Drafting is an important part of modern industry because drawings are often the best way to explain or show ideas accurately.
5. Occupational Outlook Handbook
6. Answers will vary. Some sample careers are residential designer, interior designer, and industrial designer.

Part Three: Completion

1. Interior
2. American Institute of Building Design (AIBD)
3. CADD (Computer Aided Drafting and Design)
4. technical illustration
5. industrial
6. engineering

Sample Test

Name _____

Explore the Roles of Designers

Part One: True/False

Instructions: **Write T for true or F for false.**

_____1. Designers need an understanding of manufacturing processes.

_____2. Interior designers create original designs for machine tools.

_____3. Drawings may be produced manually or with CAD or CADD systems.

_____4. Technical illustrators specialize in space planning.

_____5. Drawings provide a good way to describe design ideas that may be difficult to describe in words.

_____6. Most residential designers create dwellings as part of their work.

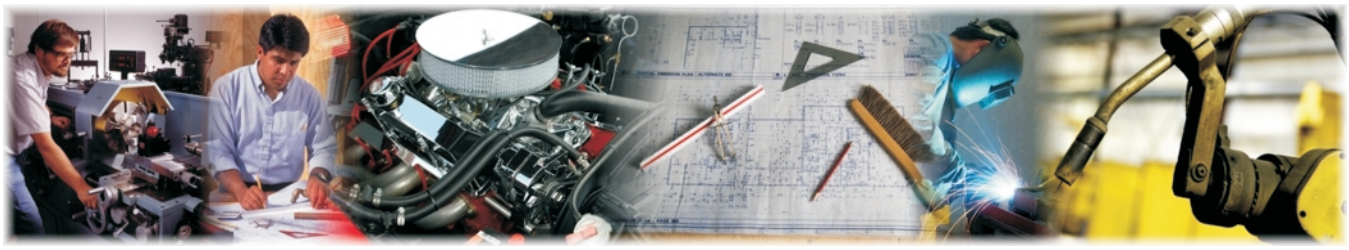
_____7. CADD allows designers to modify designs without redrawing entire plans.

Part Two: Short Answer

Instructions: **Complete the following.**

1. Name three occupations that require the ability to read and understand graphic information.

2. Describe the chief function of an industrial designer.



3. List two sources of drafting technology career information.

4. Describe the importance of drafting to modern industry processes.

5. What U.S. Department of Labor document provides career information?

6. List three career choices that someone with artistic and/or architectural drawing talent might pursue.

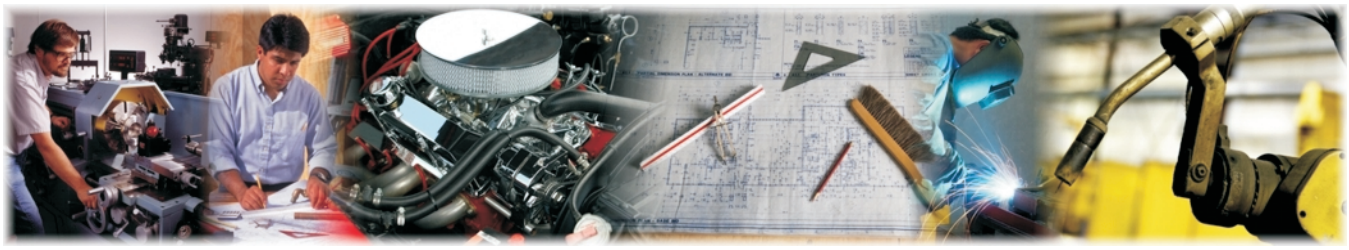
Part Three: Completion

Instructions: **Provide the word or words to complete the following statements.**

1. _____ designers produce plans to decorate indoor spaces.
2. Residential designers are certified by the _____.
3. A system that replaces drawing instruments (e.g., drawing boards, triangles, scale, and other traditional drafting equipment) is _____.
4. The process of preparing artwork for industrial applications is called _____.
5. A(n) _____ designer originates designs for cutting tools and fixtures used in manufacturing.
6. Popular CADD systems produce a large variety of architectural, _____, and construction drawings.

DESIGN CAREERS

- commercial/industrial designers
- engineering technicians
- technical illustrators
- residential designers
- interior designers
- industrial/commercial designers
- graphic designers
- floral designers
- fashion designers



LS–A

Name _____

Design Careers

Purpose

The purpose of this activity is to expose you to the various design-related careers, descriptions, educational requirements, and salaries.

Objectives

1. Fill in the space provided with the various careers presented by your instructor.
2. Make notations of career descriptions, educational requirements, and salary ranges.

Materials

- lab sheet
- writing utensil

Procedure

Use the space provided and the back of this worksheet to further communicate the careers associated within the design field.