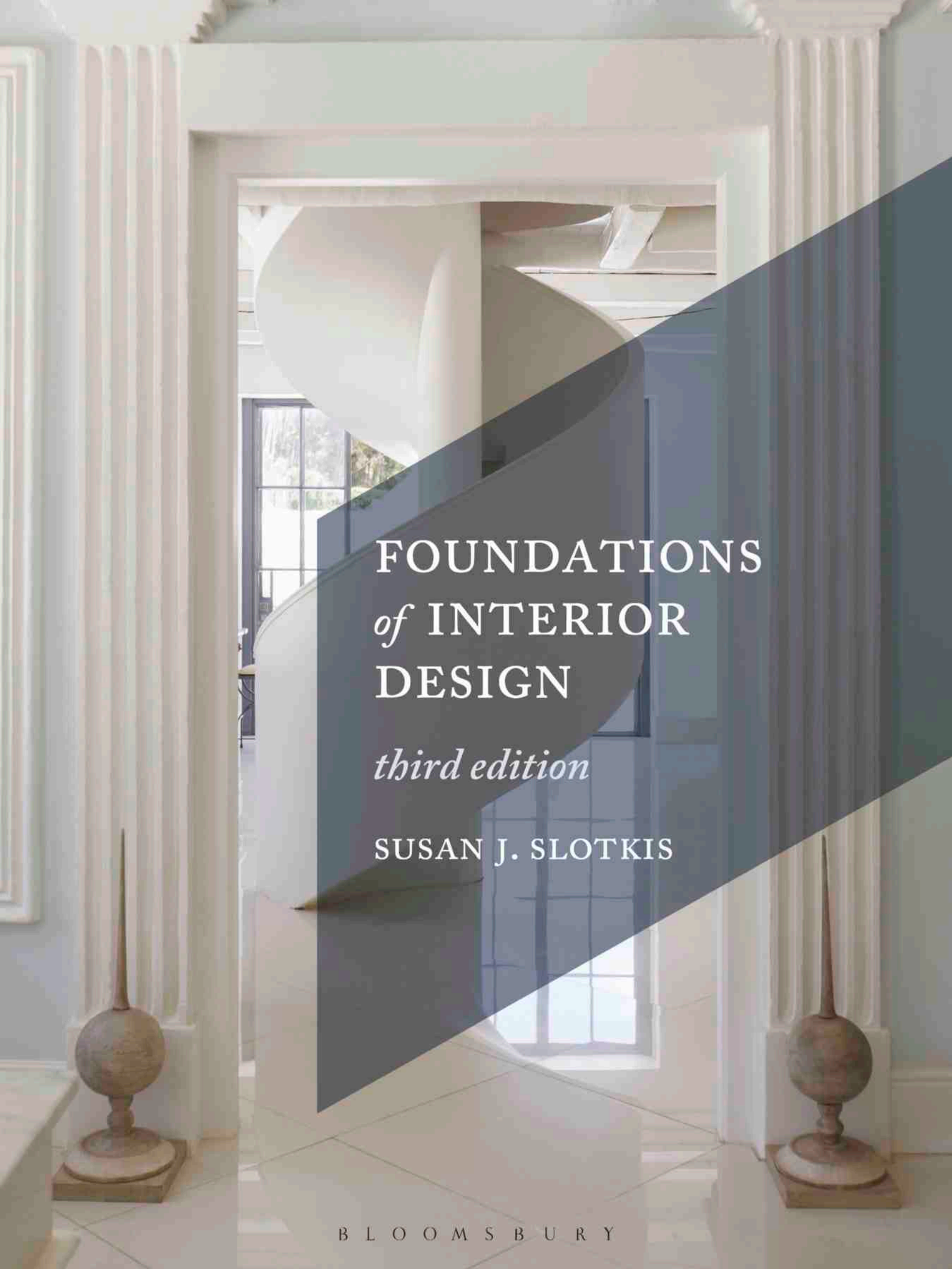

FOUNDATIONS *of* INTERIOR DESIGN

third edition

SUSAN J. SLOTKIS

BLOOMSBURY

Foundations of Interior Design

Third Edition

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Fashion Institute of Technology
New York University

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This book is dedicated to the memory of Evelyn Slotkis,
my mother, my buddy, and, undoubtedly,
the best teacher I ever had.
From her I learned the true meaning of home.

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Preface to the Third Edition

Foundations of Interior Design was written to fill a gap in the introduction of the interior design profession and practice to aspiring designers. The objective of the text was to provide an underpinning for the interior design student that would serve beyond one or two semesters or courses, be relevant for continued study, and act as a reference for professional practice. It appears to have met that objective. Change is inevitable and welcome. A new edition is warranted: first, to update the information presented, and second, to strengthen its ability to engage and inform its readership.

The third edition of *Foundations of Interior Design* takes an essential theme of the first two editions further. That is, the premise is that the interior design is practiced within a service model. The process is not only creative, but problem solving. Today's interior design student requires sensitivity to and knowledge of human factors as they relate to design solutions. Expectations for interior design to foster wellness and safety have become greater since the previous editions. With these higher expectations it is even more critical for students to be made aware of, and to appreciate, how the choices made by interior designers affect users of the spaces they design. A service model approach to design incorporates social responsibility, and this is imbedded throughout the text as an ethos or belief system, rather than as a topic restricted to one chapter. Critical thinking regarding future generations and resources, including human resources, is prompted throughout the text. Sustainable products and practices permeate this edition.

Recognition is given to the importance of history, significant events, and directions that influence culturally diverse interior design styles and solutions. This edition provides a wide range of examples of design in different styles and applications. Projects and applications designed both by individuals and as collaborative efforts locally and globally are featured, from rural America to modern Dubai.

The content is comprehensive, yet presented in a style that is approachable for students working toward a two- or four-year degree, for both recent high school graduates and career changers. Information is presented in a practical fashion, citing applications for both theory and skill sets.

The contribution of many interior designers, those who work independently or as part of larger firms, is demonstrated in the choice of illustrations and case studies. The presentation is a balance of small and large, simple and complex, and residential and contract projects from throughout the United States and abroad.

Organization of the Third Edition

The text is divided into 14 chapters. While the content follows a logical progression from the history of the profession through the student's preparation for entry into the field, some instructors may vary the order of presentation. Chapter 1 introduces the profession by citing its historical origins, noting significant

individuals in the field of design, and presenting an overview of the profession. It concludes with trends influencing interior design, including legislation and sustainability. Chapter 2 emphasizes socially responsible design within the overall framework of sustainable design. The student is presented with theoretical information to develop an understanding of human factors, global connectivity, and the impact of design decisions on individuals, society, and the environment. The responsibilities of the interior designer regarding health, safety, welfare, and environmental stewardship are presented. Chapter 3 reviews the very essential basics of design theory, including aesthetics and the elements and principles of design. Chapter 4 delves more specifically into the design element of color, its complexity, and its applications. The interior design process follows in Chapter 5, where the various steps are reviewed, from needs assessment to project completion, including concepts behind space planning and furniture layouts. Chapter 6 describes how interior design ideation, conceptual thinking, and solutions are translated into graphic communications, including hand and computer drawing techniques.

Chapters 7 through 10 cover the broad range of materials, applications, and techniques used that compose the interior space, beginning with lighting and lighting systems, followed by the shell or building materials, then the lining or surface finishes, and concluding with the feathering of the nest, or the furnishings. Attention is given to the personalization of the space with a review of art and accessories and how these elements support design concepts. In essence, building materials, as well as FF&E (furnishings, finishes, and equipment), are fully covered.

New manufacturing techniques, highlighted sustainable practices, innovative materials, products, and applications, are noted and illustrated. Collaborative solutions that address housing needs are presented. Materiality is treated comprehensively to encourage critical thinking toward potential for real-life application rather than just ideas.

Chapters 11 through 13 highlight the influences on interiors throughout history, noting how various factors have shaped spaces over time. The third edition provides several examples, including case studies, of how non-Western design and events have influenced Western design throughout history. Current movements influencing interior design are cited and described in Chapter 13. The chapter begins with setting forth many influencing factors ("design drivers") and how they influence future design. The influence of fashion, designing economical tiny houses, sustainability, and globalization are a few of the drivers analyzed.

Chapter 14 presents a down-to-earth review of business practices followed by interior designers; it assists students in planning their own future careers. Tips for job seeking, including preparing résumés and portfolios, are demonstrated. Various kinds of companies, employment types in both residential and contract design, and related careers are described. Given that many students may at some point consider entrepreneurial possibilities, aspects of running a business are included, such as working with suppliers and third parties, and purchasing goods and products. The chapter does not shy away from many issues facing today's interior designers, such as the complexity of the new economy and government policies.

Pedagogy

Each chapter begins with an overview of the chapter content and concludes with a summary, a comprehensive list of vocabulary terms pertinent to the chapter's topic, and additional exercises.

In the Spotlight sections include profiles of interior designers or industry experts or a discussion of design and innovations. In addition to the numerous tables, lists, and charts throughout the text, the *FYI . . .* feature helps students understand and remember important concepts. Maps are included to orient students to historical references influencing design. Interior design is a visual field and great attention has been given to the selection of illustrations. Over 600 illustrations, most of them color photographs, are provided to enhance the concepts, materials, and projects.

Several appendices, including professional and trade organizations and brief bios and lists of notable designers in interior design, design, and architecture, provide a substantial pool of information to explore in further study.

Foundations of Interior Design STUDIO™

Fairchild Books has a long history of excellence in textbook publishing for design education. Our new online STUDIOS are specially developed to complement

this book with rich media ancillaries that students can adapt to their visual learning styles. *Foundations of Interior Design STUDIO* features online self-quizzes with scored results and personalized study tips, and flashcards with terms/definitions to help students master concepts and improve grades.

STUDIO access cards are offered free with new book purchases and also sold separately through Bloomsbury Fashion Central (www.BloomsburyFashionCentral.com).

Instructor Resources

An Instructor's Guide is available that includes a number of options for organizing and teaching the course. Supplementary exercises and assignments are provided for each chapter. Questions and answers for each chapter are included to reinforce information and encourage thought and discussion. The test bank can serve as a tool for evaluating students' comprehension.

Also available for instructors are a PowerPoint presentation, which provides a framework for classroom lectures and discussion and reproduces all of the text's high-impact artwork, and Professional Standards Matrix, which identifies standards that apply to each chapter within the textbook, from which instructors may develop course objectives and projects that relate to CIDA standards.

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I remain grateful to the many people who have given me encouragement, information, and suggestions over the years not only relating to interior design but also regarding life's challenges. Colleagues at ASID, IFDA, IDS, and NKBA, comprising interior designers, architects, vendors and suppliers, and others related to the A&D community, have always been willing to share their knowledge and expertise. While a rather loosely organized support system, having other adjunct colleagues in my life has always been a great support. It has been a joy to reach out to former students to offer examples of their school work to demonstrate what "A" work is all about.

For this third edition I am particularly grateful to the designers and photographers who stepped up to the plate to provide high-quality courtesy professional images of their work for this book. I am confident that the readers will appreciate their great designs. I also hope they will recognize the importance of the value of what professional networking is all about. I so treasure the relationships I have garnered over the years with such top-notch professionals who have been so helpful in making this book happen.

Thanks to reviewers of the second edition selected by the publisher for their comments and feedback. They include Richard Kasemsarn, School of the Art Institute of Chicago; Sarah Bass, Stephens College; Susan Hergenrather, Marymount University; Sarah Beth Timmer, Kendall College; Kristi D. Julian, Eastern Tennessee State University; Cherylann Dozier, Eastern New Mexico University; and Rebecca Graaff, De Montfort University, UK.

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Susan J. Slotkis
2017

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KNOLL SHOWROOM

CHAPTER 1

The Interior Design Profession

The **design** of interior spaces as a concept has its roots in the earliest experiences of humans, although it was not until the 18th century that it began to be shaped as a distinct occupational specialty. And not until the middle of the 20th century did the fields of interior design begin to have an identity distinct from architecture and **interior decoration**. This chapter begins with some of the significant contributors to the emerging profession. It then explores the growing emphasis on professionalism and collaboration within the larger architectural, design, and construction communities and disciplines impacting the **built environment**. The diversity of specialties available to those educated and trained in interior design is also introduced.

THE EMERGENCE OF THE INTERIOR DESIGNER

Humans have occupied enclosed spaces throughout history, from prehistoric caves to present-day buildings. Design (creation based on a plan) and decoration (based on ornamentation) have always been a part of human history. Detailed descriptions of the buildings, materials, furnishings, and styles used throughout history are explored in Chapters 11 and 12. Here we highlight a few of the developments leading up to today's interior design profession.

Pre-Industrial Age

Prior to the Industrial Revolution, high-quality production of buildings, both in structure and materials and furnishings and finishes, were reserved for public spaces, royalty, and aristocracy. For example, during the Antiquities, in the Golden Age of Greece (5th century BCE), the temple, a place to worship gods, and the Acropolis, where government operations took place, were constructed of marble and built to strict architectural specifications based on mathematical formulas. To a significant degree these buildings have stood the test of time. We still refer to the ruins of those buildings from the Antiquities as "classic design." This was not the case for ordinary residential spaces, which were built of less expensive materials, such as mud, without the expertise of an architect, and did not survive the test of time (Figure 1.1).

During the Medieval period (330–c. 1500), with the burgeoning of Christianity and the belief in one god, architecture and decoration were even more related to religion. Due to the ravages of war and disease in Western Europe at the time, comfort, privacy, and sanitation were considered luxuries; spaces became more communal and less decorated. Homes of the wealthy landowners were like fortresses. The development of the **guild** system, similar to the trade unions of today, provided greater opportunities for craftsmanship to develop among talented artisans apart from the role of the architect. While there was no interior design profession at this point, these guild members, rather anonymously, played a substantial role in the character of the interior space (Figure 1.2).

The Byzantine style of this period was heavily influenced by the Near East, in particular Turkey. This blend of east and west added the flourish of elaborate ornamentation to the architecture and furnishings (Figure 1.3).

In the styles that followed—Renaissance (see Figure 1.4) and Baroque (c. 1450–1730), Neoclassical (c. 1760–c. 1830), and Empire (1789–1848)—the architect remained prominent in the design of interiors. In addition to the role as builder, he often served as furniture designer, tastemaker, and project manager and

Figure 1.1
View of the Parthenon, Acropolis of Athens. (UNESCO World Heritage List, 1987), Greece. Greek civilization, 5th century BCE. *(DEA/ARCHIVIO J. LANGE/De Agostini/Getty Images)*

Figure 1.2
Middle Ages interior: Haddon Hall, Derbyshire, England, 1475, shows spare furnishings and wood-paneled walls. *(Courtesy of Haddon Hall; reproduced with kind permission of Lord Edward Manners)*

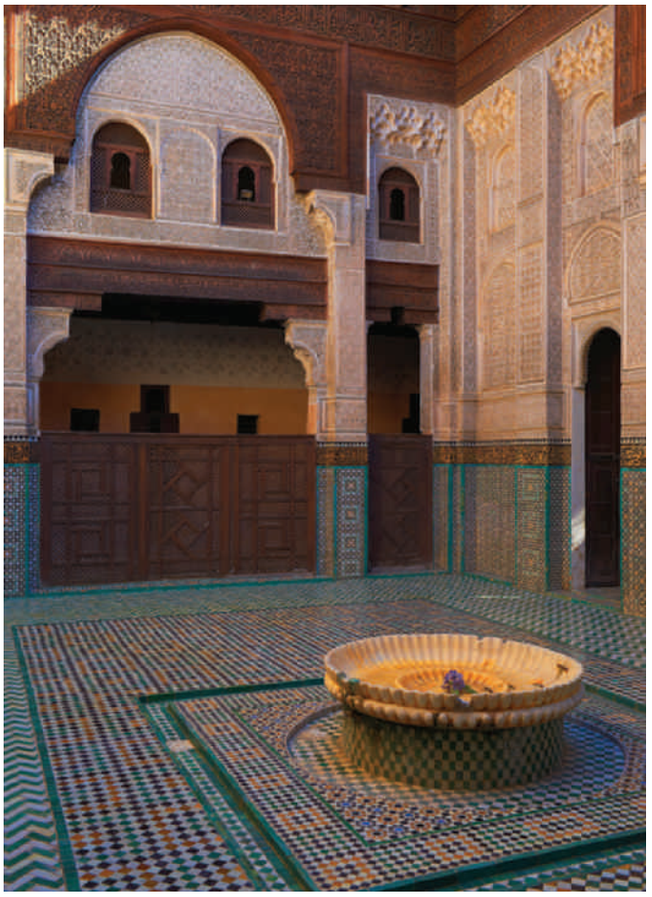


Figure 1.3
Byzantine interior. *(Educational Images/Universal Images Group/Getty Images)*

Figure 1.4
Renaissance interior: Ceiling frescoes of the Sistine Chapel by Michelangelo. *(© Fefoff/Dreamstime)*

procurer of elite artisans for important public buildings and homes for royalty and aristocracy. The term **interior architect** became associated with the late 18th century Neoclassical style. The brothers Robert and James Adam, born in Scotland and practicing architects in England, concentrated their practice on residential interiors. Their philosophy was that every detail must be executed from a single conception. Their supervision of large-scale projects may be thought of as similar to the general contractor of today but with a greater emphasis on the **aesthetics**, or *beauty*, of the design (Figure 1.5).

Late 18th Century and 19th Century Industrial Age

The Industrial Revolution began in Britain in the late 18th century with significant inventions that would influence a change from hand and home production to machine and factory. The impact of improved and faster transportation (of goods and people) and the development of new industrial processes and equipment significantly influenced the building and furnishings industries. No longer only available to the rich and famous, royalty, and aristocracy, design and decoration were becoming accessible to a broader consumer group. Over the century that followed, the expanse of choices available in materials, dyes, and styles from different countries created a niche for individuals with good taste who could coordinate all these options. The decorator emerged, either from the ranks of workmen, such as upholsterers, or from outside, such as antique dealers or agents, commissioning work from various craftsmen.

The Decoration of Houses (1897) by Edith Wharton, an American novelist, and Ogden Codman, Jr., a British architect, set forth strategies to deal with the

Figure 1.5
The little drawing room at Audley End House, Saffron Walden, Essex, 1996. Room with ornate gilt plasterwork; it was designed by Robert Adam in 1764 and decorated by Biagio Rebecca. *(Photo by English Heritage/Heritage Images/Getty Images)*

Figure 1.6
Lady Braybrooke's sitting room, Audley End House, Saffron Walden, Essex, 1994. This is an example of the taste in the late Victorian period for "busy" or "cluttered" interiors. Although the room is Victorian in character, a number of pieces of furniture within it are French, of the Louis XV period. The house was constructed in the early 17th century and is one of the most significant Jacobean houses in England. Its interior is a product of almost 400 years of history. Florence, Lady Braybrooke was the wife of the fifth Lord Braybrooke. *(Photo by English Heritage/Heritage Images/Getty Images)*

demands of the material goods imported and accumulated by members of the emerging American upper class. In essence, they became the experts at combining the old with the new. As arbiters of taste, members of high society, mainly women, gained prominence for their approaches to home décor, the **society decorator** of the time (Figures 1.6 and 1.7).

20th Century Modernism

As the 20th century began, both architects and decorators pursued the activities now called interior design. Although considerably different in style, sensibility, training, and education, they shared a common value of restraining ornamentation and limiting imitation of historical styles. The modern design movement was characterized by a decisive break with past traditions in the search for new forms of expression. Critical to this movement were the philosophies and practices of some key architects famed not only for their buildings,

Figure 1.7
Interior of guest bedroom at Hearst Castle, "America's Castle," San Simeon, Central California Coast. *(Joe Sohm/UIG via Getty Images)*

Figure 1.8
Art Nouveau, Glasgow style. Design for the Art Lover's House reception room by Charles Rennie Mackintosh, 1901. *(Maurice ROUGEMONT/Getty Images)*

but also for furniture and interior design, among them Americans Louis Sullivan and Frank Lloyd Wright and Europeans Charles Rennie Mackintosh (Figure 1.8), Walter Gropius, Eileen Gray, Le Corbusier and Mies van der Rohe (Figure 1.9).

The American society decorators of this period were essentially self-taught. American Elsie de Wolfe (1865–1950), who wrote *The House in Good Taste* in 1913, is often considered to be the first decorator, meaning this was her occupation in contrast to the architects, antique dealers, and upholsterers who dabbled in interior decoration. She transformed the dark colors of the period to softer whites and pastels and simplified the use of ornamentation. Dorothy Draper (1889–1969) began her own company. Projects for public spaces and the interiors of commercial spaces were added to her

Figure 1.9
View of architect Mies van der Rohe's classic modernist Farnsworth House, Plano, Illinois. *(Photo by Carol M. Highsmith/Buyenlarge/Getty Images)*

firm's repertoire. "Sister" Parrish (1910–1994) founded her firm in 1933. When Albert Hadley (1920–2012) joined her firm in 1962, the firm became known for the "undecorated look." Ruby Ross Wood (1880–1950) established the first decorating department in a department store (Figure 1.10).

Unlike the society decorators, Eleanor McMillen Brown (1890–1990) was a graduate of the Parsons School of Design in New York City. She founded her New York-based company in 1923, which was considered the first professional full-service interior design firm in the United States.

The prosperity in the United States following World War II produced a generation of commercial skyscraper office spaces. Florence Schust (b. 1917) trained as an architect. After her marriage to Hans Knoll (1914–1955) in 1946, they expanded the Hans Knoll Furniture Company to include a new focus on office space design, an emerging field of commercial design. Their expanded business incorporated space-planning functions with furniture sales and changed the name of the firm to Knoll Associates (Figure 1.11). The Knolls also commissioned many other modern architects and furniture designers, such as Mies van der Rohe whose Farnsworth house is featured in Figure 1.9. Chapter 12 explores more of the 20th century designers and influencers.

Figure 1.10
Ruby Ross Wood interior. *(Courtesy of Library of Congress)*

Figure 1.11
Interior design sketch of Hans Knoll's New York City office, by Florence Knoll 1950. *(Student sketch from author's collection)*

21st Century Professionalism

Already in just the second decade of the 21st century, we have witnessed substantial changes in the evolving interior design profession. Trends that have significant impact on the 21st-century interior designer include technological advances; global connectivity; an increased role in health, safety, and welfare issues; demand for sustainable design; increased governmental regulation; greater integration of research, also called **evidence-based design**; intra- and interdisciplinary collaboration; and community involvement. The term **A&D** (architecture and design) is currently expanded to include the term **design/build**, as many firms are joining with real estate developers and general contractors to engage in more comprehensive projects.

The advent of the **DIY ("do it yourself")** consumer; **c**hanges in buying behavior and attitudes; the popularity and accessibility of lifestyle retailers, such as Restoration Hardware (RH), Room and Board, and Williams Sonoma; plus online resources, such as Wayfair, have greatly changed the traditional business model, including how designers are compensated for their services, especially for purchases. See Chapter 14 for further discussion.

According to the *U.S. Bureau of Labor Statistics, Occupational Outlook Handbook 2014–2015,* interior designers held about 54,900 jobs in 2012. About 25 percent of interior designers were self-employed. Technology has changed the way many designers work. For example, rather than using drafting tables, interior designers now use complex software to create 2D or 3D images. The industries that employed the most interior designers in 2012 were described as specialized design services (at 30 percent) and architectural, engineering, and related services (at 16 percent).[1]

TODAY'S INTERIOR DESIGN PROFESSION

The profession of interior design has evolved from the earlier scope of the planning and decorating of interior spaces. Although definitions vary, certain common elements are included in most descriptions of the practice of interior design today.

The terms **interior designer** and **interior decorator** are sometimes incorrectly used interchangeably. Over

a century ago, Wharton described the relationship of interior design to architecture as the trend toward "interior architecture" that is differentiated from the "superficial application of ornament."[2]

Another way to differentiate design from decorating is to describe interior design as the activity that plans for the necessities of a space relating to issues of safety and protection and that considers the basic function of a space and space planning. Decoration, in contrast, implies ornamentation. Simply put, a decorator works only with surface decoration, such as paints, fabrics, and furnishings. Although decoration enhances a space, adds to its individuality, and may provide psychological and symbolic comforts within the space, it is not required to meet the most basic universal human needs.

The term *interior design* appeared in *Merriam Webster's Dictionary* in 1927. Interior design is described as "the art or practice of planning and supervising the design and execution of architectural interiors and their furnishings."[3] The U.S. Bureau of Labor Statistics describes what interior designers do as follows:

> Interior designers make interior spaces functional, safe, and beautiful by determining space requirements and selecting decorative items, such as colors, lighting, and materials. They read blueprints and must be aware of building codes and inspection regulations.[4]

The **International Federation of Interior Architects/Designers (IFI)** Declaration 2011 said: "Interior designers and interior architects determine the relationship of people to spaces based on psychological and physical parameters, to improve the quality of life."[5]

It has become increasingly important for today's designers to recognize and achieve the levels of education and training required to comply with the legal and ethical standards associated with the health, safety, welfare, and comfort of their clients; that is, the standards of professional interior design.

FYI . . . Contemporary Designer Insights

"Practicing art and design today requires an in-depth knowledge and understanding of global issues—economic, cultural, political, environmental and technological among others."[6] *Christopher Scoates, director of Cranbrook Academy of Art*

"Every building has some soul in it. When you go in, the building will tell you what it wants to be." *Tony Chi*

"To truly support us, a home has to stretch beyond its material properties and sustain our complex human needs."[7] *Clodagh*

"I have trained myself to seize that moment when I notice something beautiful, to understand just why it appeals to me and how the principles can be applied to design." "I believe you can find your own style simply by becoming conscious of the things that bring you pleasure."[8] *Vicente Wolf*

"I call myself a cultural shaper . . . because I think this is what design does; it shapes human behavior. Everything needs to be designed. I see the future of our aesthetic world crossing all the aesthetic disciplines so that design, art, architecture, fashion, food, music, fuse together to increase our experiences and bring greater pleasure to our material and immaterial lives. Our motivations should focus around our conscious collective memory and a desire to fill it with ideas that are seamless between art and life."[9] *Karim Rashid*

Figure 1.12
Willard Hotel lobby, Washington, D.C., designed by Sarah Tomerlin Lee. *(Courtesy of Willard Intercontinental)*

However, it is understood that many projects that would be included in the category of interior design are carried out by segments of talented people trained in specific skills, such as those related to architecture and industrial design.

For example, Philippe Starck, a French designer (b. 1949) known for his offbeat hotel designs, studied architecture, furniture, interiors, and products. Sarah Tomerlin Lee (1911–2001), an American known for her contributions in the area of hotel design, studied and worked in the fields of advertising and journalism before taking over her husband's architectural firm after his death (Figure 1.12). Clodagh, known for her concept of total design that incorporates sensitivity to the environment, was born in Ireland and began work as a fashion designer. Then, living in Spain, she became a landscape designer and architect, self-taught in all areas.

Services Performed by Today's Interior Designer

The role of interior designers in today's society is more complex and comprehensive than that of their predecessors. A major recommendation of a recent study was for the interior design community to continue to raise awareness of its distinct contributions to the interior space by recognizing its unique perspective on the humanization of space.[10] An interior designer's education emphasizes assessing the function of a space, surveying a client's needs, and involving the client in the process.

Interior designers currently provide the following services:[11]

- Help determine project goals and objectives
- Analyze a client's needs, goals, and life and safety requirements
- Formulate preliminary design concepts that are appropriate, functional, and aesthetic
- Allocate, organize, and arrange a space to suit its function
- Generate ideas for the functional and aesthetic possibilities of a space
- Develop documents and specifications relative to interior spaces in compliance with applicable building and safety codes
- Create illustrations and renderings
- Develop and present final design recommendations through appropriate presentation media
- Prepare working drawings and specifications for non-load-bearing interior construction, materials, finishes, space planning, furnishings, fixtures, and equipment[12]
- Monitor and manage construction and installation of designs
- Collaborate with other licensed practitioners in the technical areas of mechanical, electrical, and load-bearing design, as required for regulatory approval
- Prepare and administer bids and contract documents as a client's agent
- Review and evaluate design solutions during implementation
- Select and specify fixtures, furnishings, products, lighting solutions, materials, and colors
- Purchase products and fixtures
- Design and manage fabrication of custom furnishings and interior details

Figure 1.13 a
Kitchen design. *(Courtesy of John A. Buscarello & Dennis Miller Associates)*

Figure 1.13 b
Contemporary colorful room designed for a child. *(Photoshot/Red Cover/Nicolas Lemonniere)*

Specialty Segments

In addition to the numerous services professional interior designers perform, the industries and fields in which they may concentrate are diverse. In the broadest sense, interior design projects may be divided into two main categories: **residential design** and **contract** (or **commercial**) **design**. Each category includes many subdivisions. The following discussion outlines the many opportunities that exist for interior designers.

Residential design focuses on the planning and specifying of interior materials and products used in private residences. It implies that an interior designer is working within an environment in which an individual resides for a relatively fixed period. Most of the time, an individual person enters into a contract with a designer to design the interior of his or her family's home. An exception is the design of model homes. In that instance, an interior designer creates a homelike environment but is providing services to a real estate developer or management office. Similarly, many corporations hire interior designers to create spaces for employees to live in while on temporary assignment. The area of **assisted living**, generally for senior citizens, is a bridge between residential and contract design. Although these quarters are designed to house residents in their own spaces, a managing agent contracts for the design.

Residential design includes the following subspecializations:

- Model apartments
- Retirement housing, 55-plus or active senior housing, and independent living
- Multi-dwelling complexes
- Apartments, condominiums, cooperatives
- Home entertainment design
- Bath design
- Kitchen design (Figure 1.13 a)
- Home office design
- Recreational and therapeutic design (e.g., home spa, sauna, pool, and workout areas)
- Storage design
- Children's rooms (Figure 1.13 b)
- Luxury areas such as wine cellars

The contract interior designer works within environments in which a company, rather than an individual, is contracting for the design services. The interior permanent or temporary space is where a variety of activities may be carried out, for both work and pleasure. Within this broad category are several subspecializations, among them the following:

- Corporate design. Includes design for staff and executive offices, conference rooms, teleconferencing centers, workstations,

Figure 1.14
a. Corporate lobby designed by the interior design firm Carson Guest; b. Inpatient's room at the Memorial Sloan Kettering Hospital, New York City, by Perkins Eastman; c. A CCRC (Continuing Care Retirement Community) by Perkins Eastman in Japan incorporates Western programs with insights into Japanese culture; d. Nhow-Hotel, lobby; e. Charym, a fitness facility/spa in Litchfield, Connecticut, by interior designer Alexandra Champalimaud; *(a: Blend Images/Getty Images; b: Memorial Sloan Kettering Cancer Center Inpatient Unit for Genito Urinary, New York, New York; Copyright Chuck Choi. Courtesy Perkins Eastman/MSKCC Design & Construction Department; c: Sun City Takatsuki, Takatsuki, Japan. Copyright Chuck Choi. Courtesy Perkins Eastman; d: Photo by Schraps/ullstein bild via Getty Images; e: Design Firm: Champalimaud, Photographer: Antony Crook)*

Figure 1.14 ***continued***
f. The Althea Gibson Academy in East Orange, New Jersey; g. The Marc Jacobs store in Los Angeles; h. Trade show exhibit design at Maison & Objets, Paris. *(f: James D'Addio, Photographer. Designed by Hiller Architecture; g: WWD/Conde Nast; h: Jean Boggio for Franz, trade show exhibit design at Maison & Objets, Paris 2010, Image/Illustration provided by Franz Collection Inc.)*

computer stations, training facilities, relocation, or corporate apartments (Figure 1.14 a). More recently, this category may include recreational and dining spaces for company staff.
- Entertainment design. Includes interiors, lighting, sound, and other technologies for movies, television, videos, theater, clubs, concerts, casinos, and theme and amusement parks.
- Facilities management. Includes the organizational management of generally large business operations. Specialists in this area address safety and health issues; lighting and acoustical needs; scheduling of maintenance; and coordinating of office expansions, downsizing, and relocations. This specialty relies on substantial communication among the interior designer, builders, engineers, and business decision makers.
- Healthcare design. Includes design for hospitals, medical and dental offices, psychiatric facilities, clinics, ambulatory care centers, assisted living, halfway houses, hospices, rehabilitation centers, and nursing homes (Figure 1.14 b). A **continuing care retirement community (CCRC)** blends features of residential and healthcare design. It is a concept that strives to accommodate varying needs, generally of an aging population, in a clustered environment to ease transition from independence to a more supervised facility. It generally incorporates the following categories: independent living, assisted living, and specialized nursing or dementia units (Figure 1.14 c).
- Hospitality and restaurant design. Includes design for hotels, motels, restaurants, country clubs, golf courses, resorts, cruise ships, bars, lounges and nightclubs, and recreational facilities (Figure 1.14 d and e).
- Institutional and governmental design. Includes design for schools, government buildings, prisons, community centers, airports, rail stations, houses of worship, shelters, museums, stadiums, arenas, and libraries (Figure 1.14 f).
- Retail and store planning design. Includes design for specialty and department stores, supermarkets, salons, shopping malls, showrooms, art galleries, pop-up stores, trade shows, exhibitions, and displays (Figure 1.14 g and h).

Careers in both residential and contract design are driven by the economy. Currently, there is growth in the hospitality and healthcare sectors. Many occupations, other than becoming a practicing interior designer, are open to those who have received either a partial or complete education in interior design. Some recipients of interior design education prefer alternative uses for their skills and knowledge. Conversely, there are those who have first been educated, trained, and employed in related industries and *then* pursue additional education and training in the field of interior design. Among the related industries are historic preservation, set design, visual merchandising and display, showroom or retail sales, and home staging for real estate sales. Chapter 13 addresses some of these career confluences (Figure 1.15).

Practicing within any of the preceding subspecialties of interior design are people who subscribe to a particular orientation, framework, or ethic in conducting business. Four of the more common approaches are **universal design**, **sustainable design**, **evidence-based design**, and **design in the public interest**. Increasingly, these four approaches are presumed to be part of every designer's practice and eventually may not be considered specialties.

- Universal design is based on a distinct body of knowledge that relates to both human and design factors. This approach fosters opportunities for as many people as possible to have access to good design. A related specialty available for the interior designer concentrates generally on the aging population who wish to remain in their own spaces. A specific series of coursework prepares a practitioner for the appellation **CAPS (Certified Aging in Place Specialist)**.
- Sustainable design has as its goal in socially responsible design that considers the needs of future generations. Its focus is to preserve the natural environment and its resources, including people and culture.

- Many interior designers are opting to earn a credential known as **LEED** (**Leadership in Energy and Environmental Design**), a certification process managed by the **GBCI** (**Green Building Certification Institute**). More than 43,000 individuals are now LEED accredited.[13] (See Chapter 14 for additional information on LEED certification process.)
- Evidence-based design is a process of design based on methodical research to achieve an expected outcome. While originally concentrated on healthcare design, the concept has expanded its application to include other interior design sectors, both contract and residential.
- Design in the public interest rests on the notion that good design should be universal and accessible for "the other 90 percent" through affordability. This may be achieved by making goods and services available at low cost or **pro bono** and community involvement in the design process. (These two topics will be explored further in Chapter 2 and Chapter 13.)

Professionalism in Interior Design

The interior design field, like many other professions, continues to move toward achievement of professionalism by adhering to the following standards:

- Skills are acquired through education and training based on a standardized body of knowledge.
- Services are performed in compliance with an established code of ethical standards.
- Performance is evaluated by examination, oversight, or licensing by recognized authorities.
- Members are associated with and represented by an organization whose goal is to promote affiliation, education, and practice.

Professional Interior Design Associations

One of the ways in which we categorize an occupation as a profession is by the affiliation of its members with organizations. The organizations, among other benefits, provide educational and networking opportunities for their members. Both American Society of Interior Designers and International Interior Design Association have similar categories of membership in interior design and represent a mix of design specialties among their members. Both organizations define

Figure 1.15
Historic preservation (restoration) of the Beacon Theater, built in 1929, by Beyer Blinder Belle Architects & Planners, LLP for client The Madison Square Garden Company. *(Photography by T. Whitney Cox)*

a professional interior designer as one who is qualified through education, experience, and examination to enhance the function and quality of interior spaces.

The **American Society of Interior Designers** (**ASID**) evolved from a series of other organizations beginning in 1931. Today ASID's nearly 13,500 practicing interior designers work in all areas of commercial and residential design. ASID Industry Partners include more than 2,000 Industry Partner member companies, with 6,000 individual representatives, uniting the professional designer with manufacturers of design-related products and services. ASID's membership also includes nearly 5,000 students of interior design. ASID has more than 280 student chapters at colleges, universities, and design schools with two-year and four-year programs throughout the United States as well as several virtual chapters through online institutions.[14]

Headquartered in Washington, D.C., ASID is the largest North American professional organization for the interior design industry. Its stated purpose is to promote activities designed to maximize the profession's potential and goals. It administers a code of ethics and standards for appellation, or appropriate titles for various membership categories. For a complete and updated list, see www.asid.org.

The **International Interior Design Association** (**IIDA**) was founded in 1994 as a result of a merger of three organizations. The goal was to create an international association with a united mission that would represent interior designers worldwide and speak on their behalf with a single voice. IIDA is a professional networking and educational association of 13,000 members in ten chapters around the world. Furthering IIDA's goals for education and networking, specialty forums were created for its membership.[15] For additional information see www.iida.org.

The **Interior Designers of Canada (IDC)** was founded in 1972. It is the national advocacy association for the interior design profession. IDC represents more than 5,500 members, including fully-qualified interior designers, Intern members (who have yet to pass their exams), students, educators, and retired members. In addition, there are over 300 manufacturers and supplier members who provide products and services for interior design projects and firms.[16] For additional information see www.idcanada.org.

Related Professional, Specialty, and Trade Associations

Many other associations attract interior designers, along with those employed in related fields. Among organizations that might be of interest to designers are the Institute of Store Planners (ISP), the Network of Executive Women in Hospitality (NEWH), the National Kitchen and Bath Association (NKBA), the Interior Design Society (IDS), the International Furnishings and Design Association (IFDA), the International Association of Lighting Designers (IALD), and the American Academy of Healthcare Interior Designers (AAHID). Additional information on all these organizations can be found in Appendix A.

Interior Design Education

Many types of educational opportunities are currently available to individuals seeking to prepare for the occupation of interior designer. These include postsecondary-level academic programs; less formal courses of study, sometimes offered online; internships; and ongoing professional development through employment, professional affiliation, and self-study.

Several types of degree and nondegree programs refer to their programs as interior design. They range from correspondence schools and certification programs to postgraduate programs in interior design. Some courses are offered on a continuing education basis and not aimed at providing a certificate or degree.

In the United States, two-year associate degree programs, four- and five-year baccalaureate degree programs, and postgraduate programs offer interior design and related majors. There continues to be increased opportunities for studies at the master and doctoral levels. Many programs require undergraduate degrees in interior design or related fields, while others are open to undergraduates from other disciplines. Often a foundation course is required for those students to catch up on the fundamentals of interior design. Examples of postgraduate degrees

related to interior design are in healthcare, lighting, sustainability, environmental psychology, and interior architecture.

Many interior design programs are housed within a variety of academic schools, colleges, and departments. In only about one-third of accredited programs is interior design treated as a unique discipline. It is generally considered one of a group of disciplines concerned with the interaction between humans and their environment. Increasingly, interior design education has responded to the changing nature of the industry by utilizing teaching methods that enhance student awareness and knowledge of the integrated, collaborative approach to design within a culturally diverse, global context. *FYI . . . Examples of Interior Design Courses Offered by Various Colleges and Universities* provides a partial list of courses offered in interior design programs.

Interior designers are encouraged and sometimes required by many of the professional associations to keep their level of education and experience relevant through lifelong learning. There are many short-term courses for which designers can receive **continuing education units** (**CEUs**). The **Interior Design Continuing Education Council** (**IDCEC**) reviews courses for approval to be counted as CEUs for these organizations. Professional associations sponsor many of these courses. Others are available at symposiums and conferences. Often, these courses deal with topical issues, such as changes in building codes, business practice issues, new products, and technology. Many are offered as online courses.

Associations have been formed whose aim is to advance education and practice standards. They include the **Interior Design Educators Council (IDEC)**, the **Council for Interior Design Association (CIDA)**, the **National Association of Schools of Art and Design (NASAD)**, and the **National Council for Interior Design Qualification (NCIDQ)**.

Both the National Association of Schools of Art and Design (NASAD) and the Council for Interior

FYI . . . Partial List of Interior Design Courses Offered by Various Colleges

Colleges and universities throughout North America offer a range of interior design courses, including the following:

- Studio courses for residential, office, healthcare, and hospitality design
- Historical styles of architecture, furnishings, and interiors
- Color theory and application
- Computer-aided drafting and design: 2D and 3D
- Lighting theory and application
- Textiles and materials
- Methods of construction: building and/or product
- Hand drafting and perspective drawing
- Presentation, rendering, and model-making techniques
- Human behavioral, cultural, and environmental factors
- Building codes and regulations
- Professional practice, business structures, and ethics
- Thesis and research techniques : evidence-based design
- Kitchen and bath design
- Landscape design
- Portfolio development and career preparation
- Internship program

Design Association (CIDA) are organizations that review and evaluate educational programs against established criteria in order to accredit the programs. CIDA is an independent, volunteer organization that sets standards for interior design programs, culminating in a minimum of a bachelor's degree at the postsecondary school level in the United States and Canada. Reviews are done at the request of colleges and universities that wish to achieve this high level of accreditation. More than 150 interior design programs are currently accredited by the Council, serving an estimated 20,000 students.[17]

The membership of the IDEC is primarily college educators and researchers in the field of interior design. IDEC's mission is the advancement of interior design education and scholarship by promoting recognition of the contribution of interior design education, scholarship, and practice to the advancement of quality of life within the built environment. The organization strives to promote creative and critical thinking to solve problems and to expand the body of knowledge base for interior environments to improve quality of life and human performance.

Many states, jurisdictions, and Canadian provinces have moved to regulate who may use the title of interior designer and have established procedures for licensing, certification, and registration. Each state's requirements are different. Several states have included mandated continuing education requirements for recertification.

NCIDQ is an independent, not-for-profit organization. While several associations serve the needs of interior design professionals, NCIDQ exists to protect the public by setting the bar for professional competency and administering the NCIDQ Examination, which focuses solely on interior design issues that affect the public health, safety, and welfare. More than 25,000 interior design professionals have passed the NCIDQ Examination and earned the NCIDQ Certificate.[18]

The different types of legislation and requirements are discussed in Chapter 14.

Other Factors That Contribute to Professional Success

In addition to formal education in the theory and application of design, it is important for the future interior designer to consider the individual factors that can result in success. These factors include personality traits, work habits, potential and proven talents and skills, and experience.

Although a creative temperament is part of the makeup of the interior designer, it is important to realize that much of the practice of interior design requires the direction of creative energies into problem solving. Likewise, interior design is a business and, at times, may seem more administrative than creative. And finally, interior designers have considerable responsibilities relating to the health, safety, and comfort of their clients and the public.

Along with talent and technical abilities, what are some of the personal traits needed for a satisfying career? For many careers, the following traits have been shown to foster success: enthusiasm; interpersonal skills; willingness to work hard; and the ability to manage details, time, and energy level. It is important for prospective practitioners to take personal inventory of the qualities they bring to the profession as individuals. This soul searching not only helps a prospective interior designer determine if this career is the right fit, but it also guides the individual toward a course of study that will harness the talents he or she possesses into a particular direction The exercise at the end of this chapter features questions that you, as an interior design student, should continue to ask yourself throughout your education.

A joint project of Syracuse University and ASID concluded that 43 percent of respondents listed a positive, outgoing personality as a top consideration, followed by communication skills at 30 percent and technical design skills at 29 percent.[19] This text's concluding chapter (Chapter 14) addresses employer considerations for hiring a new designer. This first chapter has offered a taste of what lies ahead.

Summary

History tells us how, over the centuries, interior spaces have provided human-kind with both temporary and permanent shelter. It also tells us how essential these primal needs are and how universal the desire is to personalize one's space.

It was not until the 18th century that the profession now known as interior design evolved as an entity unto itself. The Adam brothers, in England, were early interior architects. The late 18th century and 19th-century Industrial Age created a niche for individuals who could coordinate the available choices in furnishings, leading to the emergence of the society decorator. This trend flourished in the early 20th century with the work of Elsie de Wolfe, considered the first professional decorator. The early 20th century saw the impact of a few avant-garde modern thinkers, many of them architects, who strove to return to the simplicity of the classicists while making use of new technology and materials.

The current field of professional interior design is complex and varied and requires practitioners with education, skill, and experience. Increased reliance on technology, collaboration and integrated services, sustainable design, and globalization are trends impacting the 21st-century interior designer.

Among the many services an interior designer may provide are the following:

- Generating ideas for the functional and aesthetic possibilities of a space
- Organizing a space to suit its function
- Selecting and purchasing furnishings
- Creating illustrations and plans
- Developing documents in compliance with applicable codes
- Collaborating with other practitioners

A person can practice interior design in many ways and in a variety of settings. The two broadest categories of interior design are residential and contract, or commercial, design. Within those two broad categories are several subspecialties. Increasingly, responsibility for the health, safety, welfare, and comfort of clients and the public has been added to the job of the professional interior designer. Sustainable, or green, design has been mainstreamed, and a strong knowledge base in this area is expected of the design professional of the 21st century.

The three largest interior design-centric professional organizations, ASID, IIDA and IDC, provide continuing educational opportunities and industry-related information to their members and the public. Organizations that aim to advance the education and practice of both the student and the practitioner also include the CIDA, NASAD, NCIDQ, and IDEC.

Vocabulary

A&D (architecture and design)
aesthetics
American Society of Interior Designers (ASID)
assisted living
built environment
Certified Aging in Place Specialist (CAPS)
continuing care retirement community (CCRC)
continuing education unit (CEU)
contract (commercial) interior design
Council for Interior Design Association (CIDA)
design
design/build
design in the public interest
DIY ("do it yourself")
evidence-based design
Green Building Certification Institute (GBCI)
guild
interior architect
interior decoration
interior decorator
interior design
Interior Design Continuing Education Council (IDCEC)
Interior Design Educators Council (IDEC)
interior designer
Interior Designers of Canada (IDC)
International Federation of Interior Architects/Designers (IFI)
International Interior Design Association (IIDA)
Leadership in Energy and Environmental Design (LEED)
National Association of Schools of Art and Design (NASAD)
National Council for Interior Design Qualification (NCIDQ)
pro bono
residential design
society decorator
sustainable design
universal design

Exercise: Questions to Ask Yourself

Even as you begin your studies, it is helpful to take stock by asking yourself the following questions. Write your answers and save them for future reference and updating.

1. How committed am I to the intensity and potential cost of this formal course of study?
2. How far do I intend to go in the field? Do I see this as a full-time professional career or a subject of interest that might lead me towards another job or career?
3. What specialties, if any, have I identified that I want to pursue? Does residential design appeal to me or hospitality, corporate, or healthcare?
4. Am I prepared to defer financial success initially in my career, especially if I want to start my own business or even test the waters as an intern with only a small stipend or compensation rate?
5. Am I self-motivated and self-directed?
6. Do I enjoy working with and for people?
7. Can I manage my time and have the discipline necessary to meet deadlines and other requirements?
8. Do I have the creative potential to carry out innovative design solutions?
9. Can I communicate my ideas visually, orally, and in writing?
10. If necessary, will I be able to work outside a nine-to-five schedule?
11. Am I passionate about design?

CHAPTER 2

Socially Responsible Design

More an approach to design than a specific set of standards, **socially responsible design** can be thought of as having two parallel tracks: designing for the present with current resources while also anticipating and planning for the future. It is mindful of preserving natural resources, including human resources, land resources, and energy. It implies the powerful potential for design as a change agent for the public good.

"We use space responsibly. We practice our profession with highest regard for engaging the world's economic and natural resources in a sustainable manner. We design for health, safety, well-being and the needs of all."[1]

An important component is informed design that is founded on scientific research (*evidence-based design* or EBD) discussed further *In the Spotlight* and not just on taste, style, or personal preference. For example, research has established that patients' healing improved when healthcare facilities were designed with natural elements. This finding reinforces the concept of **biophilia**, the intrinsic inclination for humans to affiliate with natural elements, discussed further *In the Spotlight*. An emphasis on research to determine desired outcomes, while originally conceived from a healthcare model, is now being incorporated into design for offices, retail operations, and educational facilities.

There are many other ways that designers in collaboration with other disciplines, such as environmental psychologists, can improve healthcare outcomes, including color selections, space-planning configurations for patients, staff, and visitors, as well as furnishings selections in the healthcare industry.

Both biophilia and evidenced-based design principles go behind healthcare projects and may apply to other projects, including residential design. Collaborations with landscape designers and architects may be a critical aspect to these projects.

Another term used to describe socially responsible design is *human-centered design*, giving emphasis to involvement of the individual and, in many circumstances, the community, in the design process. Cultural, societal, and community values and preferences are taken into account in design conceptualization and solutions. Increasingly, projects rely on an interdisciplinary approach to achieve successful and relevant outcomes. Many types of scientific research projects have demonstrated the intricate relationships between human needs and the environment (Figure 2.1). Studies in specialized fields, such as industrial psychology, environmental psychology, anthropology, social psychology, gerontology, child development, and occupational therapy have provided a wealth of information to assist designers, especially during the critical planning *(programming)* stage of a project (discussed further in Chapter 5).

Referring to the unique value of the interior designer, Mary Knackstedt cites the unique ability of the interior designer to direct movement and human interaction, to enhance the senses and inspire emotion, and to make the place a better place.[2]

In describing socially responsible design, IDEC (the Interior Design Educators Council) refers to this practice as enabling the interior designer to influence social, environmental, economic, and political systems through design interventions at the individual, societal, or global level, or a combination of these, by implementing universal design, inclusive design, and environmentally responsible design.[3] Ideally, all designers, creators, and adapters of the built environment will make this approach part of their design philosophy.

The subject matter of this chapter is complex and meant to be thought-provoking to encourage change. The essential objective of presenting this subject early in the text is to raise awareness. The ultimate aim is that socially responsible design not be a separate topic but rather a mindset that subconsciously drives all design decisions and choices. Although some examples are illustrated in this chapter, many other examples throughout the text demonstrate these concepts.

HUMAN FACTORS

In designing spaces, it is wise to consider the following concepts, the four A's of design: *aesthetics*, *adjustability*, *adaptability*, and *affordability*. The aesthetic appeal (discussed further in Chapter 3), satisfies one need for its inhabitants: its visual appearance. Other criteria include the design of a flexible space that can be adjusted or adapted to meet the changing needs of its occupants. Another criterion is that a space be accessible to many. This includes good design that is also affordable design. Designing for the public good, or design in the public interest may be provided pro bono (at no cost to the occupant). These practices are further discussed in this chapter.

Figure 2.1
Earth Day turned forty-five in 2015. Since its inception it has become a symbol of the responsibility of humans to respect the Earth they occupy. *(Gandee Vasan/Stone/Getty Images)*

FYI . . . The Seven Principles of Universal Design

1. **Equitable Use**
   The design is useful and marketable to people with diverse abilities.
2. **Flexibility in Use**
   The design accommodates a wide range of individual preferences and abilities.
3. **Simple and Intuitive Use**
   Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
4. **Perceptible Information**
   The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5. **Tolerance for Error**
   The design minimizes hazards and the adverse consequences of accidental or unintended actions.
6. **Low Physical Effort**
   The design can be used efficiently and comfortably and with a minimum of fatigue.
7. **Size and Space for Approach and Use**
   Appropriate size and space are provided for approach, reach, manipulation, and use, regardless of user's body size, posture, or mobility.

Source: The Center for Universal Design, North Carolina State University, www.ncsu.edu.

Universal Design and Inclusive Design

As defined in Chapter 1, universal design is an approach to design based on the goal that a design serves the widest range of users under the greatest number of situations. Or, as defined in 1997 by the Center for Universal Design (at North Carolina State University), "Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." "The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities."[4]

The center also outlined seven principles of universal design (refer to *FYI . . . The Seven Principles of Universal Design*).

Universal design is based on a body of knowledge that combines scientific findings from many vantage points, including physiology, manufacturing, and technology. The term *universal design* is much broader than a focus on physical access or barrier-free design; see Chapter 5 for more examples. All people can be categorized in a "special user group" (discussed below) at one time or another because of the normal aging process, accident, disease, or other circumstances. Anyone who has had a broken arm or leg knows the challenges of limited mobility and accessibility. Likewise, a person who wears corrective lenses will be visually impaired without them. Accommodating a broad range of users may also be termed **inclusive design,** often used alongside universal design as another comprehensive and descriptive term. Universal or inclusive design should not draw attention to a disability, or stigmatize its users. With the myriad of well-designed products available today, there is no reason for any built-environment design to present itself as an accommodation to impairment. It should just express "good design."

Sensory Experience through Space

In her book *Total Design*, Clodagh explains the way humans experience space:

> Sensory experience shapes the way you react to a space. As you move through any physical space, your eye is constantly scanning—for distance, color, light, size, the potential threat, the possible solace. You become aware of the temperature as you walk, as well as the air pressure, the vibrations, the weight and dimensions of the space. You register a spectrum of scents. Your ears filter meaning from sound. Constantly and quietly, you categorize all this sensory information, automatically adding it to your internal library, the delicate database within that stores all memory, keeps you aligned, and regulates your moods and feelings.[5]

We experience space on many levels, although not always consciously. Humans respond to sensory stimulation and strive toward **homeostasis**, a state of equilibrium and well-being. Although individuals react to their environments differently from one another, we all seek this state of being. Our sensory experience is often described as our *comfort level*. We are more likely to recognize our experience in a space when we are aware of a negative reaction—that is, the lack of homeostasis. This reaction may be articulated as discomfort or a poor fit. When we enter and occupy an interior space, it is through our senses that we take in much of the information, and this sensory process becomes our experience in that space.

Under normal circumstances, we have five senses available to us: sight, hearing, touch, smell, and taste. The brain processes the information taken in through the receptors of these five senses. We then have a perceptual experience, such as the visual perceptions of color and light (see Chapters 4 and 7).

If there is a deficiency in a person's ability to receive information through any one of these receptors or in the brain's ability to process the information, compensation often occurs. For example, a person who does not see may have a heightened sense of hearing or smell.

Sight Sight is the sense that most people rely on to describe the physical attributes of a space. The visual sense adds to the appreciation of our surroundings. Sight is also a way in which specific information is experienced, such as the perception of one color as distinct from another color.

It is often a negative visual experience that triggers our awareness that this sense is at work. For instance, when we are blinded by glare, this is experienced through our visual sense. Glare bothers our eyes as overly stimulating colors, stripes that appear to move, or a high level of contrast. Our eyes may feel strained when several different small patterns are viewed simultaneously.

Hearing Hearing is the **auditory** experience through which our ears perceive sound, in the form of vibrations (Figure 2.2). Certain sounds or high levels of sound may be experienced as noise. In some contexts, such as in a dance club, noise may be considered desirable, but it is disturbing in other situations. It may even reach the stage of noise pollution, actually causing harm, for instance, when a helicopter hovers over a residential area.

Acoustics is the science that deals with the production, control, reception, and effects of sound. Interior designers pay close attention to the acoustical quality of surfaces as a means of controlling everyday sound levels, based on the needs of the occupants and the function of the space. Designers often rely on acoustical experts when planning spaces in which sound is of major importance, such as an auditorium or theater or the media room of a residence. See *FYI . . . Tips for Providing Good Sound Quality.*

Touch Touch is our **tactile** sense, which receives perceptions of pressure or traction, usually through the skin as we touch a surface. The skin, our essential outer surface, is the end receptor as we experience texture. To express the feel of a fabric, the term *hand* may be used. For example, high-quality cotton may be described as having a "good hand." Textures are described according to how they feel against our skin, such as smooth or rough.

Skin is a receptor that also transmits information deeper into the body. For instance, we have a **thermal** reaction as our skin absorbs air and as we touch objects and assess their relative temperatures. The amount of moisture in the air, ranging from humid to dry, affects a person's perception of the surrounding space

FYI . . . Tips for Providing Good Sound Quality

A designer can use auditory experiences to enhance a client's comfort level, including the following:

- Use sound-absorbing finishes, such as carpet (floors), fabrics (furniture), and draperies (windows).
- Avoid high ceilings in public areas and in common use areas, such as dining rooms.
- Plan spaces so as to separate areas for noisy activities from those for quiet ones.
- Select quiet appliances, such as choices for air conditioners and fans.

Source: Adapted from Samantha McAskill, "Designing for Acoustics, Hearing and Aging," https://www.asid.org/content/designing-acoustics-hearing-and-aging.

and sense of comfort. The amount of heat in a space is taken in by the skin receptors, among others, and translated into an experience of either comfort or discomfort, hot or cold. The sense of air circulation or ventilation is experienced through the skin as well.

Touch is also related to our muscles and joints and to body motion. This becomes the bare bones, if you will, of the field of ergonomics (see later discussion). For example, a person who spends a lot of time standing or walking on a concrete floor will experience fatigue and perhaps joint pain. This occurs because of a lack of resiliency in the composition of the floor (discussed further in Chapter 8), which touches the body and is transmitted to muscles and joints.

Smell Smell is the **olfactory** sensation delivered through the nose. Exposure to malodorous situations, such as spoiled food, garbage, chemicals, or decay, produces a negative olfactory experience. The result may even be harmful, such as when toxic odors are breathed in and affect the respiratory system. It is easy to understand why designers consider the sense of smell when planning the location of facilities such as bathrooms, food areas, and garbage disposal areas.

Today, it is becoming less acceptable to strive merely for a neutral, no smell environment. Our noses take in pleasurable odors, such as the smell of fresh flowers, perfumes, fragrant spices, and foods. **Aromatherapy**, an approach based on the healing potential of scent, has become an important consideration for designers, not merely those in healthcare fields or healing environments, but also those designing spaces for retailers, spa owners, and home owners.

Aromas often provide strong links to memories. People have individual and cultural associations with certain smells. Some scents, such as citrus fruits, are considered fresh; others, such as musk, are considered sexual.

Taste Taste is the sensation most closely connected to smell. The relationship of taste to interior spaces is less well documented than the connection to the other senses and is perhaps less direct. Both restaurant design and food presentation take into consideration how taste is perceived within the environment.

Figure 2.2
Waterfall and sculptures of diving men inside Dubai Mall, the largest shopping mall in the world. *(Sylvain Sonnet/Photolibrary/Getty Images)*

A restaurant that seeks to promote a perception of hominess can help achieve this not only through a design that evokes a cozy interior, but also through a menu featuring "comfort foods" that bring to mind familiar experiences.

Human Engineering

The way in which humans and things interact effectively may be thought of as **human engineering**. In addition to understanding how individuals experience space through their senses, designers must also be aware of the ways in which our physical dimensions and mechanics interact with the technical and physical attributes of the built environment.

Anthropometrics Simply stated, **anthropometrics** is the study of human body measurements. (Table 2.1). Information from these research findings is compiled into charts by categories of individuals, such as adult males, adult females, and children. Dimensions for these distinct groups are then classified in several different situations, such as at rest, standing, kneeling, sitting, reaching, reclining, and viewing (Figure 2.3 a and b).

These dimensions are used to establish relatively uniform standards for furniture, fixtures, and clearances, such as doors and corridors. Based on these norms, for example, most standard desks and tables will be approximately 28 inches high; counters, 36 inches above the floor; seat height, generally 18 inches high; and so on. Also refer to Basic Metric Conversion Table on page 443.

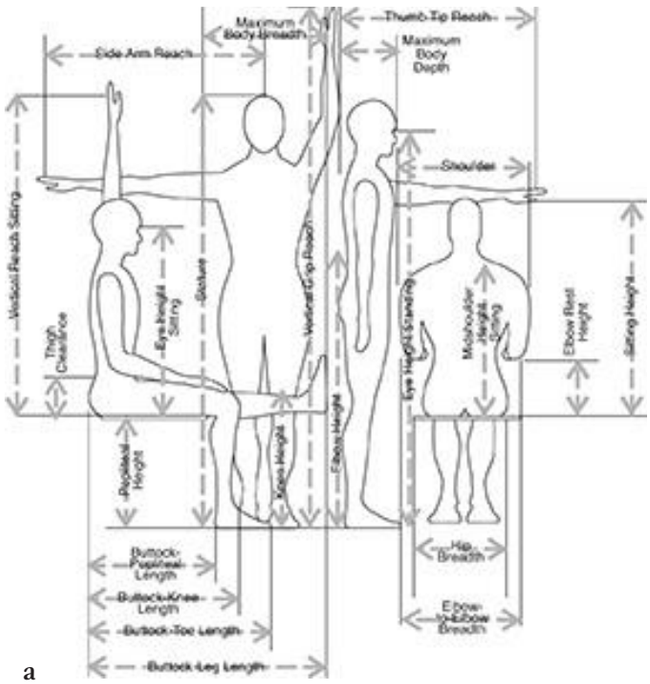
These design standards can satisfactorily accommodate 90 percent of the user population. However, individuals who are either below the 5th percentile or above the 95th percentile for any particular dimension would not be accommodated. Consider the population of "size-challenged" individuals, such as those born with dwarfism or gigantism, with extremes in height variations, or those with bariatric conditions also known as obesity. Refer to *FYI . . . The Arissa Collection*, which addresses the need for suitably sized furnishings for persons with bariatric conditions.

It is the goal of universal design to ensure as close to 100 percent suitability as possible. Standardized furnishings can be improved with features that provide adjustability. Such features also raise the level of comfort for those in the 90 percent average because they, too, have their own variations (Figure 2.4).

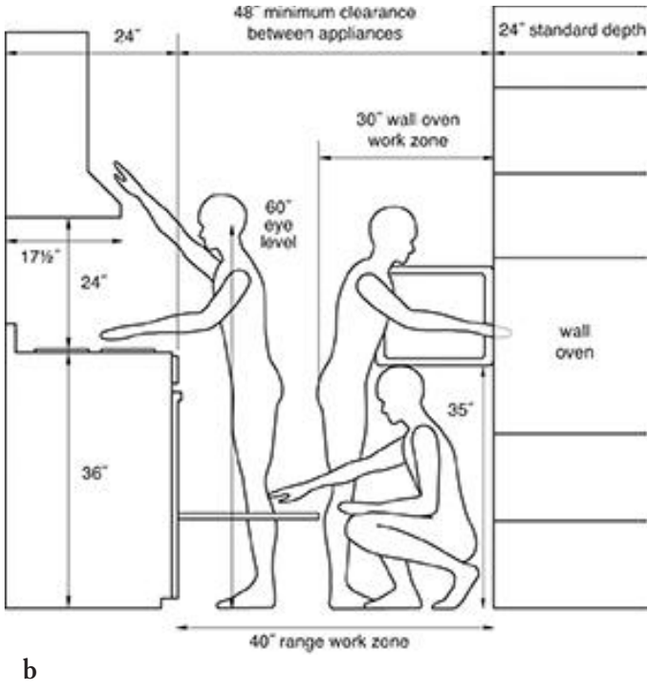
Table 2.1
Selected Anthropometric Features of Adults

		Male Percentiles			Female Percentiles		
	Body Features	5th	50th	95th	5th	50th	95th
1.	Standing height	63.6	68.3	72.3	59.0	62.9	67.1
2.	Sitting height, erect	33.2	35.7	38.0	30.9	33.4	35.7
3.	Sitting height, normal	31.6	34.1	36.6	29.6	32.3	34.7
4.	Knee height	19.3	21.4	23.4	17.9	19.6	21.5
5.	Popliteal height	15.5	17.3	19.3	14.0	15.7	17.7
6.	Elbow-rest height	7.4	9.5	11.6	7.1	9.2	11.0
7.	Thigh-clearance height	4.3	5.7	6.9	4.1	5.4	6.9
8.	Buttock-knee length	21.3	23.3	25.2	20.4	22.4	24.6
9.	Buttock-popliteal length	17.3	19.5	21.6	17.0	18.9	21.0
10.	Elbow-to-elbow breadth	13.7	16.5	19.9	12.3	15.1	19.3
11.	Seat breadth	12.2	14.0	15.9	12.3	14.3	17.1
12.	Weight, pounds	126.0	166.0	217.0	104.0	137.0	199.0

Source: Ergonomics: A Guide to People & Productivity (Londonderry, NH: SIS Human Factor Technologies, Inc., November 1994), 4.



a



b

Figure 2.3 a and b

a. Anthropometrics: Various typical positions and activities; b. Kitchen clearance dimensions. *(a: Fairchild Books; b: Fairchild Books)*

FYI . . . The Arissa Collection

To better serve the needs of patients in ambulatory bariatric facilities, the Arissa Collection of seating was developed. Created for KI by designers Paul James and Dan Cramer, the series of aesthetically appealing seating adapts to the dimensions of size-challenged individuals. Users can sit comfortably in several different ways.

KI Arissa Collection for Bariatric Seating. *(Courtesy of KI)*

Source: Janet Wiens, "Design Collaborative: Seating for All," *Interiors and Sources,* April 10, 2010.

Figure 2.4

The Aeron Chair designed by Herman Miller is available in three sizes to cater to users of various statures. *(Courtesy of Herman Miller)*

Ergonomics An applied science, **ergonomics** is concerned with designing and arranging things people use so that people and things interact most efficiently and safely. It is an approach to design that fits the environment and its equipment to the person, not vice versa. Ergonomics combines anthropometric data and an understanding of body mechanics, or physiology, with product and equipment know-how, in an effort to adapt the work or working conditions to suit the worker. These efforts relate not merely to jobs and employment but also to the various activities with which humans are involved. It relates to human comfort and safety.

The field of ergonomics began after World War II. At first the new field was primarily involved with improving the productivity of workers. Accident prevention, reduced absenteeism, and increased profit margins were the main objectives. The field of ergonomics has broadened over time. Moreover, the rising number of individuals working from home has expanded the concept of increasing productivity through ergonomic solutions beyond the office and factory.

Computer use in the home, school, and workplace by people of all ages has created a far greater need for more user-friendly design solutions. Recommendations based on ergonomic studies have influenced the design and position of items such as keyboards, wrist pads, monitors, desks, and chairs. Many changes were made to alleviate symptoms of health conditions known as **work-related musculoskeletal disorders (WMSDs)**. Symptoms resulting from a poor fit between humans and machines include stiff necks, fatigue, low-back pain, stress on joints, and carpal tunnel syndrome. When muscles are kept in a prolonged static contraction, as occurs when sitting and working at the computer, their blood flow is inhibited. Consequently, the muscles become fatigued, resulting in a need to exercise them, and often leading to fidgety movements, poor posture, or frequent breaks away from the work site to relieve strain.

One study of productivity concluded that intermittent standing as a means of providing the required movement to relieve the buildup of fatigue is as effective as taking breaks away from the work site. This study demonstrated that workstations with stand-up capability would increase worker well-being and, therefore, organizational productivity.[6] This finding is the premise behind the Telescope series of office furniture, developed by the Danish company Omann, which features adjustable-height equipment that enables the user to alternate between sitting and standing positions (Figure 2.5).

The concepts of adjustability and flexibility are basic to ergonomics and universal design. These concepts are probably most readily identified in the plethora of task chairs designed over the past several decades. These chairs aim to prevent joint and muscle problems, poor posture, and other stressful conditions of the body. Humanscale (Figure 2.6), an office furniture company concerned with ergonomics, says this about its company:

> Finding work tools that adjust to the user, promote spontaneous movement and counter the negative effects of sedentary behavior is key for wellness at work. The active workspace is a thoughtful new concept that encourages balance so workers—whether in traditional work set-ups or in home offices—can build more activity into their daily routine for long term health.[7]

Figure 2.5
Ergonomics: Young woman in office working at adjustable desk. *(Westend61/Rainer Holz/Getty Images)*

Figure 2.6
Ergonomics: Freedom task chair with headrests by Humanscale. *(Courtesy of Humanscale)*

Figure 2.7
A woman preparing food in her kitchen at Ellwood Cottages, a set of self-catering holiday cottages in rural Dorset. The woman is mobility impaired and uses a wheelchair. Woolland, Dorset, England. *(Visit Britain/Pawal Libera/Getty Images)*

Special User Groups

Disability often comes to mind first when considering groups of people with special or unique needs in relation to the built environment. The term *disabled* may be assigned to an individual with a physical or mental impairment that substantially limits one or more major life activities.[8]

Physically impaired persons may include those with ambulation difficulties, such as poor balance. Sensory impairments include the visually impaired population, both the partially sighted and the blind. Individuals with hearing loss, like those who are visually impaired, also need special consideration, as do people with mental impairments. Age is a very important factor in defining special user groups. Children, as well as the elderly, have different needs to consider. *Size-challenged* persons, mentioned above, who may be outside the anthropometric norms for height and girth may be considered a special user group. There is a growing special needs group that is challenged by the norms established by anthropometric tables relating to size—more specifically, girth, or the measurement around a person's body. The prevalence of overweight and obese people in the United States has been steadily rising. More than one-third of U.S. adults are obese.

Mobility Impaired According to the U.S. Census, nearly one in five Americans has some kind of disability, and more than one in eight has a severe disability.[9] A person is considered to have a disability if he or she has difficulty performing certain functions or activities of daily living. If a person is unable to perform one or more activities or uses an assistive device or needs assistance from another person to perform basic activities, he or she is considered to have a severe disability. One in five Americans has arthritis. The issue of accessibility is generally key to designing for individuals with mobility impairments, particularly for those who rely on wheelchairs, canes, crutches, or walkers.[10]

Limited mobility is perhaps the most vital challenge to designing accessible, suitable, and aesthetically appealing spaces for this population (Figure 2.7). It is this special need that prompted the national legislation known as the **Americans with Disabilities**

Act (ADA). The ADA legislation is a comprehensive civil rights law passed by Congress and signed by former president George H. W. Bush in July 1990 after lobbying efforts by veterans of the Vietnam War and other groups called for laws mandating improved public spaces and accommodations for the disabled. The ADA first went into effect in January 1992; it was amended in 2008 to clarify and reiterate who is covered under the law. While very significant regulations were mandated, many professionals consider these standards to be minimal requirements and hope that those involved in the built community will continue to find enhanced products and solutions.

The term **accessible design**, also known as **barrier-free design**, is often used to indicate compliance with the ADA. The ADA has a comprehensive set of guidelines. See *FYI . . . Key ADA Design Provisions*.

Visually Impaired [11] Three percent of Americans are visually impaired. For Americans older than age 70, one in six has visual impairment. This number is expected to rise considerably not only in the United States but in other countries with aging populations. People with visual impairments require additional tactile and acoustical sensations to compensate for the lack of visual acuity. For visually impaired people who use canes, unobstructed walking spaces are critical. Braille, a form of graphics with raised dots, is used for signage purposes for the visually handicapped, generally those blind from birth or childhood. Other innovations in signage include raised letters, symbols, and numbers to identify floors and doors. The use of auditory mechanisms to cue directions in public spaces, such as at crosswalks and for navigating in museums, is another example of efforts to modernize accessibility.

People with partial sight or color deficiency benefit from exaggerated differences in lightness between foreground and background colors. For example, the contrast between blue drapery and yellow walls is more effective than that between yellow drapery and orange walls.

The normal aging process results in twice the amount of light needed for 40-year-olds as for 20-year-olds; twice that for 60-year-olds as for 40-year-olds.

FYI . . . Key ADA Design Provisions

The following are some of the key provisions used to make a design more suitable for the physically impaired:

- A minimum door opening space of 32 inches
- Barrier-free passage, as follows: single passage that is 36 inches wide; double passage that is 60 inches wide
- A bathroom with a clear space of 60 inches to enable a wheelchair to turn around
- Doors to accessible bathrooms that swing out, not in
- A minimal slope for ramps that provides a rise of 1 foot for every 12 feet of length (1:12 ratio)
- Ramps that are 36 inches wide
- Emergency warning systems with both audible and visible signals

Hearing Impaired More than 34 million Americans have some degree of hearing loss.[12] A total of one in four Americans older than 70 has a hearing impairment. Approximately 15 percent of American adults aged 18 and over report some trouble hearing. Approximately 15 percent of Americans between the ages of 20 and 69 have high frequency hearing loss due to exposure to noise at work or during leisure activities. Nearly 25 percent of those 65 to 74, and 50 percent of those older have disabling hearing loss. In addition to their impaired auditory sense, many of these individuals have difficulties with balance. In the same way that visually impaired people are better served through enhancements to other sensory experiences, such as sound, the hearing impaired need to rely on enhanced visuals, such as lighting systems that provide warning signals and security.

Mentally Impaired Increasingly more attention is being given by the architectural and design community to the special needs of the other types of impairment, including neurological, cognitive, and mental

conditions. One factor promoting a focus on the needs of this group has been the growing number of persons afflicted by Alzheimer's disease, a form of dementia that seriously affects a person's ability to carry out daily activities. The National Institute on Aging estimates that there are 5 million people in the United States with some degree of this disease.[13]

People with Alzheimer's disease have a unique combination of physical, cognitive, and psychological needs. Recent research has given interior designers some recommendations to follow when designing for this group. For instance, it is advisable to avoid heavily patterned and active prints. Yellow is a preferred color because it feels comforting and pleasing. People with Alzheimer's disease, as well as developmentally disabled individuals, may also need extra assistance, such as proper lighting and visual cues, in finding their way through spaces.

At the other end of the continuum is the increased prevalence of autism among children. **Autism spectrum disorder (ASD)** is a range of complex neurodevelopment disorders, characterized by social impairment, communication difficulties, and restricted, repetitive, stereotyped patterns of behavior. According to the Centers for Disease Control over 2 percent of children in the United States are diagnosed with ASD, with boys being five times more diagnosed than girls. Studies in Asia, Europe, and North America average 1 percent of ASD cases.[14]

A condition known as **seasonal affective disorder (SAD)** is a form of depression that tends to recur as the days grow shorter during the fall and winter and the amount of daylight is reduced. Not to be confused with the so-called winter blues, the ordinary craving for sunlight most of us experience during this season, SAD is a clinically diagnosed condition thought to be related to the brain's secretion of the enzyme melatonin. Since this condition was first identified in 1985, great strides have been made in developing appropriate interventions. Full-spectrum lighting, light boxes, and other forms of **phototherapy** are now used to help alleviate this condition. Refer to Chapter 7 for further information on lighting fixtures and applications.

Aging Population The special user group of the elderly is a broad category. The normal aging process brings change, often accommodated by relatively simple yet effective design problem solving. However, the needs of the frail elderly raise distinctly different issues, requiring an understanding not only of the aging process, but also of the impact of illness and debilitation on the day-to-day functioning of this population.

The elderly population is growing rapidly. In the United States, the 2010 Census recorded the greatest number and proportion of people age 65 and older, that is 13 percent of the total population. By 2050, people age 65 and older are expected to comprise 20 percent of the total U.S. population.[15]

Aging and urbanization is a global phenomenon. The world is rapidly aging. The number of people aged 60 and over as a proportion of the global population will increase to 22 percent by 2050. By then, there will be a greater number of older people than children (aged 0–14 years) in the population for the first time in human history, according to the World Health Organization (WHO).[16]

The concept of an aging, rather than elderly, population is perhaps more appropriate because the term *aging* denotes a continual process rather than a static condition. This aging population is also living a relatively healthier life than previously. Medical advances have brought unsurpassed longevity to a worldwide population.

The concept of **aging in place** has gained momentum since the term was coined in the 1990s. Aging in place is simply a matter of preserving the ability for people to remain in their home or neighborhood as long as possible.[17]

Increasingly, attention is given not just to the house itself but to community support systems to foster health, social interaction, and transportation.

According to a recent ASID study, 83 percent of those over age 45 who were surveyed said they would like to remain in their current residences for as long as possible. The National Association of Home Builders (NAHB), in partnership with AARP, developed the **Certified Aging in Place Specialist (CAPS)** program, designed to teach professionals how to modify homes for aging in place. AARP, an organization dedicated to the over 50 population, has produced a checklist to evaluate the age-friendliness of a community.

Figure 2.8 features an attractive and adaptable bathroom that would suit the physically able as well. Also refer to *FYI . . . Tips for Designing for Aging in Place*.

The increasingly mature population also creates the need for a broad range of housing alternatives, from retirement villages to hospice (*end of life*) care, with independent-living, assisted-living, and skilled nursing care facilities in between. A growing development is that of the Continuing Care Retirement Community (CCRC), in which complexes are created that provide varying levels of services and housing as needed. Another trend includes other supportive housing alternatives such as co-housing (nonrelated adults living under one roof) and multigenerational housing options, including the in-law apartment in a single family house.

Children As with aging, normal childhood development poses situational concerns that provide an opportunity for creative design solutions that enhance comfort and livability (Figure 2.9).

The need for safety when children are involved is self-evident. The crawling and early walking stages pose a multitude of risks in the home. Various

Figure 2.8
Interior bathroom of an accessible home. *(© Corbis Premium RF/ Alamy)*

Figure 2.9
Special user group: Children. *(Courtesy of and designed by Sam Paxhia)*

FYI . . . Tips for Designing for Aging in Place

ASID created a set of guidelines for designers that include the following tips for working with people who are planning to age in place:

- Gain knowledge of the aging process, life-stage needs, and appropriate products.
- Help clients plan ahead.
- Understand the ergonomic needs of the frail and elderly.
- Locate master bedroom and bathroom on the ground floor.
- Create good traffic flow with few steps between rooms.
- Select furniture that is easy to move and to get in and out of, preferably with rounded edges.
- Reduce the amount of furniture to make it easier to get around.
- Use smaller kitchen appliances that are lighter in weight and easier to grip.
- Replace basement laundry rooms with smaller washers and dryers that fit in the bathroom or a utility closet.
- Employ color contrasts as an aid to visual acuity.
- Increase lighting and use remote controls; avoid shadows.
- Create well-organized, easy-to-reach storage facilities.
- Consider smooth floor surfaces and avoid thick carpet.
- Install a walk-in shower; build in a large, wide seat in the shower; or add a seat to the tub.
- Use slip-resistant floor tiles or smaller tiles with more grout lines.
- Install grab bars in the bath area and near the toilet; toilets should be adjustable in height.
- Use levers rather than knobs wherever possible on doors, cabinets, and sink fixtures.

Source: Aging in Place—Aging and the Impact of Interior Design. (Washington, D.C.: ASID, 2001).

adjustments, or *childproofing*, must be made when a child is introduced into the family. Children do not naturally comprehend danger until about age six. Therefore, it is the adult's responsibility to ensure that hazards are eliminated wherever possible.

Perhaps less apparent are comfort issues for children. Child-sized beds, desks, chairs, and tables are commonplace. Adjustments in sink and toilet seat heights are now being produced with child anthropometric data in mind.

Choices designers make to furnish spaces for children affect their health, development, and safety. A growing concern is the rapid increase in asthma in children, especially in urban environments. (The relationships among allergens and specific products and finishes are discussed further in Chapters 8 through 10.)

Like the elderly, children have distinct needs relating to both color and light (see Chapters 4 and 7). Furthermore, with children using computer equipment at early ages, ergonomic data related to a child's physiology are being incorporated into the design of these products.

Behavioral Aspects of Spaces

According to the hierarchy of needs established by the sociologist Abraham Maslow, a human's most basic need, after nourishment and sleep, is to feel safe. It is difficult to satisfy higher-level needs, such as the need for self-esteem, if a person is starving, sleep deprived, and afraid of attack. Once people have a sense of safety, they go on to satisfy their other needs, including comfort, privacy, and individuality (Figure 2.10).

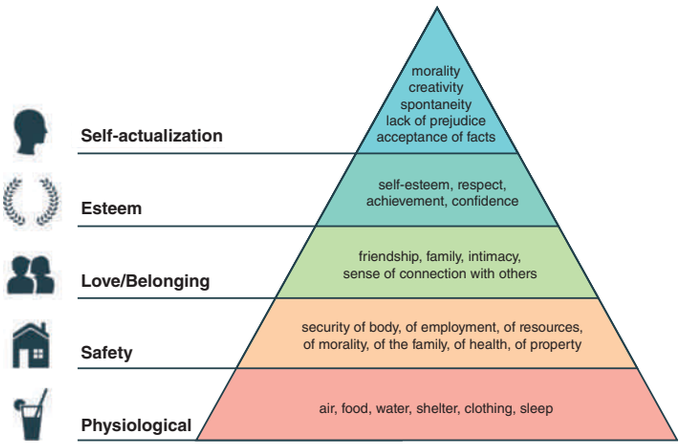


Figure 2.10
Hierarchy of human needs. *(Getty Images)*

Figure 2.11
Clever use of storage room dividers separate the territories for two siblings. *(Photo by Tim Ebert; interior designer credit: Esther Sadowsky, Allied Member ASID, Charm & Whimsy)*

Territoriality This basic need for protection from harm and freedom from danger is expressed through a behavioral trait known as **territoriality**. A basic concept in the study of animal behavior, territoriality is usually defined as "behavior by which an organism characteristically lays claim to an area and defends it against members of its own species."[18] This behavior, which is associated with nesting instincts, has also been documented in humans. Territoriality has often come to imply the need for self-identity and freedom of choice. The adage "good fences make good neighbors" expresses the need for one's physical space to be delineated.

Similarly, the concept of privacy—the universal need to control how much and what types of interactions we have with others—is an essential ingredient in the quality of life.[19]

In interior design the boundaries of space may be defined very distinctly, for example, by using walls to create separate rooms or areas. Or, boundaries may be made subtler, for example, by using partitions or screens to define different spaces for different users or different activities (Figure 2.11).

Territoriality sometimes reflects status. In office environments, for instance, the boundaries for the executive areas may be set significantly differently from those for the clerical staff, such as a private corner office for an executive or a communal area for clerical staff. Chapter 5 will provide additional considerations and solutions related to planning for various types of residential and contract spaces in relation to how people live, work, and communicate.

Proxemics Pioneered in the 1960s by Edward T. Hall (1914–2009), an American anthropologist, **proxemics** is the study of the nature of spatial distances maintained by people under different circumstances. In his book *The Hidden Dimension*, Hall describes the challenges involved in generalizing these zones of personal distances among people, recognizing many cultural differences. Nonetheless the charts that have become widely referenced are the ones based on observation and interviews with individuals whom he describes as a sample of healthy adult business and professional men and women, primarily from the northeastern United States. Hall identifies four distinct distance zones: **intimate distance**, **personal distance**, **social distance**, and **public distance**. Characteristics of these zones are summarized in Table 2.2.

Each of us, regardless of our personal or cultural experiences, can relate to how often we experience discomfort related to these zones in a variety of different contexts (Figure 2.12).

The concept of **behavioral setting**, or **behavioral mapping**, addresses the desire to distinguish spaces according to activity. It is predictable that people sleep

Table 2.2
Characteristics of Edward T. Hall's Four Distance Zones

Zone: Intimate distance Close Phase: 0'–6"; used in lovemaking, wrestling, comforting, and protecting Far Phase: 6"–18"; in public, being this close may make people uncomfortable; they compensate by avoiding eye contact	**Zone: Social distance** Close Phase: 4'–7'; used by people who work together or those who gather in casual social situations Far Phase: 7'–12'; used in formal business and social discourse; large desks in offices of important people hold visitors at this distance
Zone: Personal distance Close Phase: 18"–30"; most Americans become uncomfortable when strangers are this close; expressed colloquially as being "in my face" Far Phase: 30"–4'; the distance at which someone is kept "at arm's length"	**Zone: Public distance** Close Phase: 12'–24'; a formal style of distancing Far Phase: more than 25'; used by public figures and actors; beyond 30', people must exaggerate or amplify their gestures and voice to be perceived

Figure 2.12
Bangladeshi shoppers throng a market during the Islamic holy month of Ramadan in Dhaka. Ramadan is the Muslim majority nation's busiest time for retail sales, with clothes the most popular item ahead of Eid-al-fitr, which marks the end of Ramadan. *(MUNIR UZ ZAMAN/AFP/Getty Images)*

in bedrooms and, therefore, need beds or some reasonable facsimile in the way of furnishings. In densely populated areas, where space is at a premium, interior designers face some extra challenges. Delineation of boundaries and objects according to prescribed, predictable patterns of behavior is critical to space planning (discussed further in Chapter 5) (Figure 2.13).

Personalization **Personalization** occurs when the basic needs for safety and comfort are satisfied and

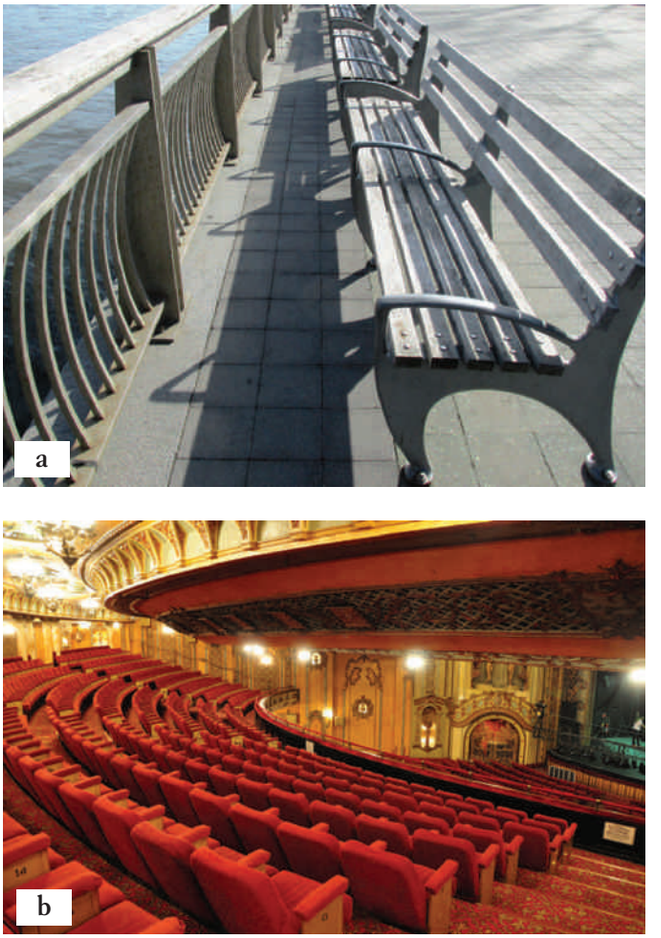


Figure 2.13 a and b
a. Furniture design and placement often dictates proxemic relationships such as with an urban park bench; b. Public space from seats to the stage in a typical theater. Source info: Auditorium, State Theatre, Sydney. *(a: Courtesy of the author; b: Charlotte Pache/Getty Images)*

humans strive for their environments to reflect individuality. The designer Clodagh expresses it this way: "A home cannot be truly beautiful unless it functions in harmony with who we are . . . it's about pleasure: discovering what pleases us and creating an environment that will celebrate those qualities and sustain us."[20]

The office or work environment has shifted over the years from the cubicle—a compartmentalized, impersonal, boundary-oriented approach—to a more personalized concept, then to a more communal open plan, and now a return to more personalization of one's space. Adolescents, commonly known for their need to express their differences from adults and children, may be at odds with their parents about how to design their private spaces (Figure 2.14). Such human factors may become part of a designer's problem-solving efforts in trying to satisfy all his or her clients.

Figure 2.14
Teen room. *(CF Photos/Alamy Stock Photo)*

CULTURAL CONSIDERATIONS

As part of social groups, individuals want their spaces to promote positive and effective communications and associations among people. People have varying needs for privacy, interaction, and socialization. As a part of cultural groups, people need to feel that their spaces promote a sense of familiarity and common ground, demonstrating shared values, norms, and attitudes. When we speak of culture, we may be referring to the geographic, regional, or ethnic identity of a people; an individual's religious or spiritual association; a people's objects or traditions; or even a particular lifestyle.

Cultural sensitivity becomes an important trait for interior designers. This sensitivity involves being aware that a client's inclination toward certain design decisions may be influenced by his or her cultural identification or experience. This applies to not only residential design but also to contract projects in an increasingly connected global business environment. When designers are involved in developing a prototype for a business with multiple branches, such as a retail store, hotel, or restaurant franchise, one of their tasks is to enhance that business's brand identity. Respecting cultural differences while maintaining a company's look and personality is a challenge that faces a designer who may be working on a company's projects in such disparate locations as Chicago and Saudi Arabia.

The global marketplace provides opportunities for interior designers to select products made by artisans and craftspeople from around the world who use indigenous materials and traditional methods, part of the sustainability movement and the desire for authentic products with a narrative, that is, tell a story. Nonprofit organizations, such as Aid to Artisans and GoodWeave, promote the needs of artisans and workers in developing countries. Aid to Artisans, an international nonprofit organization, provides assistance in the promotion of the handcrafted goods to a broader market base. GoodWeave, an internationally recognized nonprofit group, sets standards to eliminate unfair child labor practices and provides educational opportunities for children in Nepal, India, and Pakistan relating to the carpet industry. There are many profit-making companies that have developed fair trade practices in working with artisan groups, providing opportunities for better wages while creating

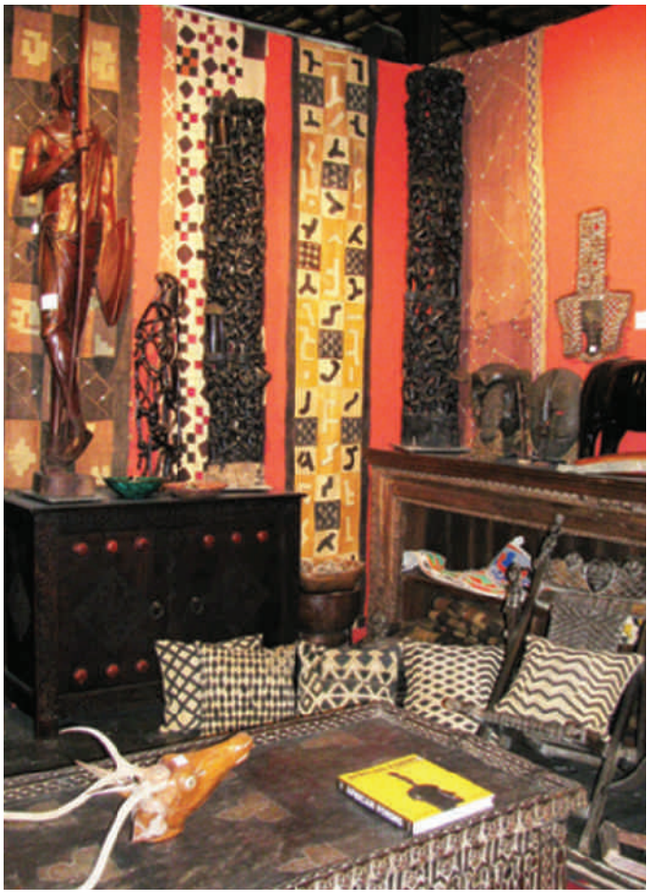


Figure 2.15
Cultural diversity in products are featured in this retail store. *(Courtesy of the author)*

marketable products. This has expanded to include "big box" retailers, such as West Elm, part of Williams Sonoma Home that launched its fair trade product category in 2015. Examples of ethnically diverse products are shown in Figure 2.15.

ENVIRONMENTAL FACTORS

The relationship of the population to environmental resources, such as matter and energy, is the focus of environmental science. The design community has increasingly become involved in the effort to sustain Earth's resources for future generations.

Sustainable Design

The term *sustainable design*, introduced in Chapter 1, conveys an approach to design that focuses on preserving the natural environment and its resources for the future. The sustainable movement derives from a paper titled "Our Common Future" (also known as the Brundtland Report), which identifies worldwide concerns that threaten the future. "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."[21] Energy conservation and the use of sustainable resources (sometimes referred to as green products) are primary considerations, as summarized in the 3R's: *reduce*, *reuse*, and *recycle*. Additional R's now include *renew*, *reclaim*, *repurpose*, *restore*, *reinvent*, etc.

A limited interpretation of sustainable design focuses on the greenness or eco-friendliness of a product's ingredients, such as choosing cork for its renewability over mahogany. Consideration of manufacturing techniques and transportation to the end user, especially in relation to energy conservation and waste management, adds a more complete picture. An increasing world challenge is water conservation. "Blue is the new green" is a phrase used to emphasize the importance of water conservation, especially in developing nations, where the potable water supply may be endangered. In a recent article for *Interiors and Sources*, Keri Luly, a sustainability programs manager, states, "Currently, 2.8 billion people live in places with some degree of water scarcity, and it predicted that 75 percent of the world's population will be by 2025."[22] One aspect to the challenge of sustainability is **environmental stewardship**, the responsibility of global citizens to manage and preserve our natural resources.

Recently, attention has been paid to the science of **biomimicry** to help solve these problems. The concept, established by the biologist Janine Benyus, uses nature as a model to inspire designs and processes that solve human problems. At biomimicry's base is the belief that studying nature will uncover effective and sustainable solutions to issues such as thermal comfort, indoor air quality, and acoustical privacy.[23] Another idea is that of **cradle to cradle (C2C)**, described by William McDonough and Michael Braungart in their 2002 book of the same name. Cradle to cradle expresses the notion that products be developed with the potential for continuous renewability, that is, so as to live on forever in some form, without doing harm. This is in direct opposition to a cradle-to-grave approach, in which goods are made with obsolescence in mind, thereby creating the need for more and creating wasteful consumption.