Introduction to Media Art and Design

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What Does this Book Cover?

This book introduces media art and design. It introduces students who are seeking careers in media art and design to the concepts, philosophy and history distinct to new media arts.

What is Media Art and Design?

First, let us dissect the term media art and design. If you asked any person on the street, they could provide you with an example of an artist. Each of us knows a person or has heard of a person who paints, plays music, or builds interesting things. However, ask yourself to define the term artist. Did any of the following words come to mind?

- Creativity
- Expression
- Different
- New
- Influence

If you placed 50 people in a room and asked each of them to define an artist, they would each have a slightly different definition. That's because the concept of an artist is much more complicated than we can define in a few short minutes. The one concept that most critical thinkers will support is that artists make art. What then is art?

What is Art?

A comedian once said that "I don't know what art is, but I know what it's not." That is not far from the truth. Is an automobile art? Is a skyscraper art? Consider the following list and check off any item that you believe is art:

- ❑ Your home
- ❑ The quilt on your bed
- ❑ A poster on your wall
- ❑ A can of soda
- ❑ A website
- ❑ A movie
- ❑ A painting
- ❑ Your furniture
- ❑ A pastry
- ❑ A sweater you own

An argument can be made for and against each of these items as a piece of art. Your home was the product of some creative solutions and craftsmanship. The quilt on your bed was colored and arranged based on some awareness of what is pleasing to the eye. Although mass-produced, many

of the items that we use on a daily basis could be considered art. However, the question remains, what is art?

Searching the Internet for the definition of art yields hundreds of definitions. Most of these definitions center around a single theme. Artists, who employ their skill to create, make Art. Webster's English dictionary defines art as "the conscious production or arrangement of sounds, colors, forms, movements, or other elements in a manner that affects the sense of beauty." Based on that definition, art can be created using music, paints, and your body or just about anything else, you could imagine.

Ask yourself if you think the following can be considered art:

- The preparation of food
- The arrangement of flowers
- The communication of ideas

These general topics are considered the culinary arts, floral arts, and the writing arts respectively. Each employs a level of creativity in the arrangement, preparation, or communication of its parts.

The second part of the definition of art requires that the art "affect the sense of beauty." As art professionals, we describe the theory of beauty as an aesthetic. For example, a piece of art that pleases our senses might be said to have a positive aesthetic value. Likewise, something that might not look nice, or seem beautiful, will be said to have a negative aesthetic value or no aesthetic value. In general, something that positively influences the attractiveness of a work of art is said to add aesthetic value. While most people admit that *beauty is in the eye of the beholder,* it continues to be important to evaluate the aesthetic value of an artist's contribution.

You should now understand that art is a creative endeavor that involves intentional arrangement to create positive aesthetic. When we evaluate art, we critique the aesthetic value of their decisions. Most people like to distinguish between good art and bad art. While a former rock band like New Kids On The Block, or a bad movie might not seem like good art, it is still considered art. This is because our contemporary definition of art proclaims that *art is everything*. Due to the contributions of major artists in the twentieth century, the definition of art has been expanded to include nearly every product that requires a person to create. By this definition, there is art in paving roads, hammering nails, and recycling trash.

The media arts are a category of the arts that describe art for mass communication. This is the media as we describe it in every day language. Art for commercial uses such as movies, television, magazines and the Internet are part of media art.

What is Design?

Have you ever looked at a piece of art and asked, " What is the artist thinking?" Have you ever noticed that some pieces of art do not have much aesthetic value, but they inspire you to think critically about a topic? These are issues of design.

Design is much easier to define. Design is purposeful, logical organization to meet an objective. Where art employs the emotional, design employs the logical. Both art and design are creative

endeavors. However, unlike the sense of beauty, which varies dramatically between people, design can be evaluated as succeeding or failing.
Design addresses function. When we evaluate a design, we are asking whether it has met its goals. For example, Alexander Gram Bell designed the first telephone system to allow people to talk over long distances. When the phone system worked it was a successful design.

In the history of the personal computer, there was much competition among computer designers. The Altair was the first personal computer, but the Apple II computer proved to be a better design. The Apple computer company went on to be a success, while the makers of the Altair are but a blip in the history of computers.

Whenever you ask whether or not something works well, you are evaluating its design. Most of the consumer items we buy combine *form* and *function*. That is, they combine the artistic, *form*, with the *functional*, design. On your television remote, for example, there are specific functions that must be supported. These include changing channels and turning the power off and on. These functions are packages in a way that may or may not be aesthetically pleasing. Some televisions remotes use color, shapes, and size to make it both easier to use and easier to look at.

What to Expect.

This book will introduce you to the common concepts that constitute the media arts. It encourages you to understand issues of creative problem solving, art production, and the relationship of media arts industries to each other. After reading this book, you will better understand the roles, responsibilities, and central concerns of the following industries:

- Animation
- Graphic Design
- Video Game Art
- Visual Communications
- Web Design
- And more . . .

Activities

1. Do some research on the Internet or at the library. Review some opinions about the definition of art. Try to define art in one to three sentences. Compare your answers with other students.

2. Find an item in your home that you think is exceptionally well designed. It could be your telephone or it could be your fork. In a few bullet points, describe why that design is strong. Does it combine form and function?\

Advanced Topic: ***Modern Art Theory and Philosophy***

Since Plato's Symposium there have been a variety of theories of art that suggest art endeavors imitate the beauty in nature. In essence, since humanity lacks the ability to create such an intricate system as nature, humanity chooses aspects of nature to recreate.

Later this theory was abandoned for one that suggested art was the product of expression itself. Instead of a being a mechanical process of reproduction, it became a mystical process of expression, guidance and even discovery. The artist was then viewed as a guide capable of exposing a world the sciences could not.

Roughly, the patterns of art appreciation and art production have been bounded by these two philosophies.

Modern philosophers seek to resolve the questions their 2000-year-old predecessors had. With the increasing permutation of the social sciences (sociology, psychology, etc) there has been more philosophies relying on the societal factors that define art and non-art.

Professor Martin Irvine of Georgetown University suggests that "the art world is structured as a network of social-economic actors who cooperate . . . to enact and perpetuate the art world." These players include:

- Art schools and art teachers
- Artists
- Art historians and academic art theorists
- Art critics, art writers, art magazine and art journal editors and publishers
- Professional guilds and associations for artists, educators, and dealers
- Dealers and galleries
- Curators, museum directors, public and private art collection managers
- International art fair organizers, supporters, funders
- Managers of international art fairs (biennials, Documenta, etc.)
- Art collectors
- Art patrons, donors, public art funders
- Art materials suppliers and materials fabricators

When evaluating artwork he suggests "doing research: Build out the big picture when studying an artist, an art work, a movement, an art genre." This includes:

- "[Situating] art work in the constitutive network of relations to disclose how the work came to be included in the art world.
- [Asking] were the necessary actors, what institutions and art world containers defined the work, what were the social-economic conditions (follow the money), how was the work/artist received in the art world, what were the contexts for interpretation."

George Dickies is a leading modern theorist on evaluating art and understanding the value of an aesthetic. He and his contemporaries have had the challenge of exploring art theory at a time when artistic theory itself is being deconstructed. As a product of democratic explosion and anti-intellectual imperialisms, the slogan *art is everything* has blossomed. Outsider art created by previously excluded members of the art community, as well as the artifact arts, of which found objects represent the most challenging artist's claim, complicate a modern definition of art and aesthetic value.

Advanced Activities:

1.Conduct research to identify five major philosophies of art. Outline each philosophy in a paragraph.

2.Choose one piece of art and evaluate its artistic value based on the five philosophies researched in assignment 1.

Case Study: The American Visionary Art Museum (AVAM)

From the avam.org website:

The AVAM highlights art by self-taught individuals and artistic visionaries.

Visionary artists don't listen to anyone else's traditions. They invent their own. They hear their own inner voice so resoundingly that they may not even think of what they do as 'art.'

*Dubuffet's beloved Art Brut Collections, formed exclusively from the "raw art" creations of non-artists, such as street people, hermits, factory workers, housewives and psychic mediums, motivated him to say: '**Art is at its best when it forgets its very name**.'*

Exhibiting Artists:

Uri Geller

Psychic Uri Geller Created the Geller Effect art car. It is covered with 5000 psychically bent spoons and forks.

Marc Lamy

Lamy was placed in a psychiatric institution suffering from auditory hallucinations and acute insomnia. Lamy discovered that drawing had therapeutic effects. Using a fine-point architectural pen and guided by “supernatural voices,” Lamy embarked on a series of elaborate geometric drawings, composed of thousands of tiny, machine-precise lines. Lamy draws when he is battling insomnia.

Ray Materson

After shoplifting a toy gun and attempting a carjacking, he was sentenced to 15 years in jail. To escape the brutal reality of prison, Ray began embroidering detailed scenes on hankies using unraveled sock thread. Containing roughly 1,200 stitches per square inch the two-by-two-inch portraits are so detailed one can see smoke rising from a cigarette.

Emery Blagdon

Emery Blagdon devoted his life to building enormous Healing Machines (several of his relatives died of cancer). Over the course of 30 years, Blagdon transformed an 800-square-foot barn into a 3-D maze of mobiles, small jars of chemicals, foil, Christmas lights, and other cancer fighters. He believed that a person’s disease could be cured by exposure to the auras emanating from his “machines.” “The energy fields from my machines help with arthritis and any other illnesses,” he said. “A scientist could explain this, I can’t. I just know that it works.”

Being a Commercial Artist

There is a joke that reads, what is the difference between a commercial artist and a fine artist? *A commercial artist makes money*. While this is an oversimplified definition, it is not too far from the truth. Successful commercial artists are paid well for their efforts. In exchange, they must provide quality work that adheres to specific deadlines and requirements.

Being a commercial artist can be one of the most satisfying careers in the world.

Creativity

When you begin your job as a new media professional, one of your most important abilities will be your creativity.

Creativity within a professional environment is different than in the fine arts or in school. Creativity in a professional environment is creativity **within bounds**. Unlike other assignments where you may have been asked to use your creativity to a create anything you can imagine, creativity in the commercial world requires you to be creative within a set of limitations outlined by your company or your client. For many people this is a difficult adjustment.

The first challenge you will face in being a commercial artist is learning to be creative within bounds.

When we are creative, we often look inward for ideas. We reflect about what we might want to create and then set to creating that vision. In a commercial environment, you may be responsible for creating someone else's vision. This does not mean that you will not be creative. Instead, you must create your art based on a set of requirements. These requirements may be described by your company, your boss, your client or even a team of evaluators. Typical commercial art assignments include:

- Create an animated advertisement for the New Sparkle dishwashing brand. You will create the animation based on the sequences we have provided you.
- Create a new logo for the Bright Lights movie studio. The logo should use the company's colors and convey the types of movies the company produces.

In these examples, there are very simple requirements. The logo must use the company colors, and the animation must include the sequences described. In a professional environment the requirements may be much more complicated. Most assignments are the product of frequent, regular meetings that help the creative team shape their understanding. Every piece of commercial art is the product of many revisions. Sometimes the requirements change, other times your understanding of the requirements was not right. With frequent meetings, these problems can be corrected before it is too late.

As a commercial artist your creativity bounds also include:

Time

Businesses are very sensitive to time. Creative projects are often a part of much larger business projects. The launch of a new logo may, for example, coincide with the launch of a new line of products. Just as the people who work the assembly line must meet their deadlines, the creative team must too. Missing deadlines reflects poorly on the artist. It deteriorates confidence in their abilities, and discourages people from trusting them with future projects. In many cases missing deadlines means losing your job.

Resources

Resources are the materials and tools used to create your art. These include art materials, cameras, computers and even the people around you. In a perfect world, you would have all the resources you could ever need. Unfortunately that's not the way this world works. Have you ever played a video game or watched a movie and thought to yourself – it would be better if they did something different. Many projects are built short of their ideal because there are not enough resources to create the artist's vision. That video game or movie was built on a budget, and that budget limited the resources available. As an artist, you will need to be creative in your use of the resources you have available.

Responsibilities

Not all of your responsibilities will be creative in nature. Sometimes you will have to complete paperwork, attend business meetings, and travel. These responsibilities will effect the amount of time in which you have to be creative.

Managing Yourself

Most artists will admit that they can't simply turn their creative powers on and off, as they need them. Instead, we have to be in the mood to be creative, or wait for the ideas to come to us. Unfortunately, business and a business's customers cannot always wait. Successful commercial artist have learned to trigger their creativity and how to get themselves out of creative blocks.

One means of controlling your creative abilities is to understand how people arrive at creative solutions. Many psychologists and philosophers have studied this process. The following is a list of the steps involved in creatively solving a problem. These include:

- **Accepting the situation**
- **Analyzing the problem**
- **Coming up with ideas**
- **Implementing the solution**

You should notice that being creative is much more than simply coming up with great ideas. Creativity involves research and reflection. If you are ever having problems being creative you should review this list. Try to identify your current stage, and then figure out how you might move yourself through that stage quickly. If for example, you know you have just finished defining the problem, then you are into the research phase. You should spend some time identifying the research that will serve your needs best. Create an outline of the research tools

you will use, then start using those tools. You will find that your creative process is streamlined. In a short time, this process will be instinctive – you will organize your time based on it.

While one of your most important talents is your creativity, it is not the only talent you will need for being a successful commercial artist. You will also need to be very good at managing yourself.

Many commercial artists freelance. Freelancing involves working on a project-by-project basis without committing to a specific company. A freelancer might, for example, take a 6-week project to create a web site for a company. When they are done with that project, they may take on another project to create a few small animations for the web. Each new agreement for a project is documented in a contract between the freelance artist and the individual or company for which they are working. This is why we sometimes call freelancing, contracting.

An artist who freelances is really operating a business. The product of the business is whatever the artist produces. As such, a freelance artist must be a businessperson and an artist at the same time. They must manage their expenses, time, and resources while finding time to be creative. Freelancing also requires discipline, since many freelancers work from home or offsite.

One of the most important tools for freelancing is a portfolio. A portfolio is a collection of a works created by an artist that demonstrates the artist's range and abilities. While the contents of a portfolio vary widely from industry to industry, the concept is the same. As an artist, you must demonstrate your abilities through work you have already completed.

The Portfolio:

Regardless of your interest in freelance work, it is important to have a quality portfolio. Interviews are often won by the strength of your portfolio. Think of a portfolio as your marketing tool. If Hollywood releases a movie with your favorite actor, you are more likely to see it, right? Likewise, if an artist has good work in their portfolio, companies are more likely to be interested in them. Just like an actor who has starred in good movies, you should make sure you work on good projects.

You might be asking yourself when you should start working on your portfolio. The best time was yesterday. In general, every time you work on a creative piece you should be evaluating it for inclusion in your portfolio. Failed commercial artists make the mistake of pulling together a portfolio late in their academic or professional careers.

One of the best ways to ensure a quality portfolio is to keep yourself organized. Even if another artist produced a better piece of art, they have to be able to provide it in their portfolio. If they cannot find the art, it does not demonstrate their abilities, it only demonstrates that they that are disorganized. First and foremost, store your artistic works in a single cabinet where you can protect your work from damage and find it easily.

Activities:

1. Create a list of items you would like to add to your portfolio. Start by listing items you have already created, then create a list of items you would like to add to your portfolio in the next year.
2. Find a website, book, or experienced professional that can describe the experience of being a freelance commercial artists. Get one interesting story or anecdote from that resource and sketch it in comic book form.

Creativity and Creative Problem Solving

There are many approaches to creativity and creative problem solving. Although many of us are used to "just being creative, it is a good idea to formally understand how we are creative. A formal understanding of creativity allows us to master our own creativity. It gives us a starting point when we are lost, and guidance past the creative roadblocks.

There is no optimal way to be creative, but several groups have attempted to model the creative process. Here are a few of those models.

Creativity Models

Alex Osborne wrote How to Become More Creative and Applied Imagination in the 1950s. These works created the foundation for modern brainstorming. Osborne's research yielded a simple, seven step model that outlines the process of creativity in the normal human being. It is Osborne's model that first offered the term brainstorming.

Alex Osborne's Seven-Step Model for Creative Thinking (Brainstorming):

1. **Orientation**: Point out the problem
2. **Preparation**: Gather data by researching the problem.
3. **Analysis**: Breaking down the problem into a simple list of items.
4. **Ideation**: Stockpile alternatives through research and creativity.
5. **Incubation**: Evaluate ideas generated through ideation.
6. **Synthesis**: Create from the gathered pieces of potential solutions.
7. **Evaluation**: Judge the results

In 1981, Kohberg and Bagnall introduced a model that has remained popular. It is called the Universal Traveler Model.

The Seven Universal Stages of Creative Problem-Solving

1. **Accept the situation**: Acknowledge the situation as challenge and commit to it.
2. **Analyze**: Research the problem to more wholly understand the problem.
3. **Define**: Identify the key issues and goals that encompass the problem.
4. **Ideate**: Generate options through creativity.
5. **Select**: Choose from among the options generated.
6. **Implement**: Give form to the selected idea. Implementation may include a creating a work of art, putting the idea to paper, or simply acting out the solution in your environment.
7. **Evaluate**: Review and plan again

Case Study: The Matrix

The artistic team for the Science Fiction movie, The Matrix, wished to convey the power of comic books in a movie format. In particular, the writers, wanted to be able to freeze a frame and allow the viewer to see all the angles of an action sequence. This idea, more commonly known as *bullet time*, was a problem that required creative problem solving.

The creative team followed the **Universal Traveler Model** to arrive at an acceptable solution.

1. First, the team **accepted the situation**. They decided that it was worthwhile to work to create bullet time.
2. Second, the team **researched the problem**. In researching the problem, they asked questions about the idea and tried to answer them simply. This part of the process is called analysis. They asked themselves the following questions:
    a. Has anyone created bullet time before?
    b. Is bullet time essential? Are there ways other than bullet time that would allow us to accomplish our proposed goals?
3. Next, the team **analyzed** the problem to identify the key issues involved in shooting the bullet time movie sequence. They also specified their specific goals for the creative project. The primary goals was as follows:
    a. To create a cinematic experience that rivals the experience of reading a graphic novel in intensity and aesthetic appeal.
    b. To create a visual device that describes the main character's exceptional abilities to perceive time and manipulate space in the Matrix.
4. Once the goals were established, the team began to **brainstorm** ideas. They spent many hours imagining ways to solve their problems. The ideas included the following*:*
    a. Strap a rocket to a movie camera so that the camera would move faster than the actor's actions.
    b. Use traditional slow motion camera techniques and computers to slow the actor's original actions.
    c. Align hundreds of still cameras in a row and time them to take a picture in sequence. Combine the still pictures using a computer and fill in any missing frames.

5. In the next stage the team had to decide which of their proposed solutions was worth doing. This is known as **selection** because the team had to select one or a few ideas from the list they created in ideation
    a. Strapping a rocket to a camera was both dangerous and expensive. Without needing to test the idea, they could eliminate this solution as too risky.
    b. Using traditional slow motion camera techniques might work, but it did not allow them to freeze the action and move the camera at the same time. Although this technique was not ideal, it was reliable and practical. It could become a good backup plan, in case none of the other ideas could be implemented.
    c. Aligning still cameras was a very creative solution. It was adapted from the idea that every movie is a series of a still photographs placed in sequence. This was identified as the best possible solution.

6. The obvious next step was for the team to **implement** their idea. After some testing, they worked to create bullet time using option 3, aligning still cameras. Since this idea had never really been used in a motion picture before, they decided to spend some of their

time and resources to use option 2 (slow motion technique). If for any reason the ideal solution did not work, they had a *backup plan* that assured that the movie would be made.

7. Once the project was completed, the team of technical artists, concept artists, writers and directors **evaluated** the success of their solution. They asked themselves the important questions*:*
    a. *Was bullet time effective?*
    b. *Did we accomplish everything we set out to do?*
    c. *Did we encounter any problems that we did not expect?*
    d. *How could we have improved the process?*
    e. *If given a second chance would we do anything differently?*

The evaluation stage is one many people like to skip. However, it is essential for assuring future success. In technical fields such as Game Design and Web Design the evaluation stage is referred to as a **post mortem**. Post mortem means *after death* in Latin. You may have heard the phrase used in a police drama, where a murder victim may have a post mortem in order to determine cause of death. Regardless of the success or failure of a project, evaluating the experience will influence your future projects in a positive way.

The Important of Creative Problem Solving Models

The product of the bullet time creative process was an experience that awed audiences. The movie was a phenomenal success and the technique of bullet time was imitated by many movies. The solution was used in the sequels to the movie and by the other successful blockbusters.

It is essential that a commercial artist understand that the creative process is more than simply coming up with great ideas. The process includes feeding creativity through research and investigation as a well as implementing those ideas and evaluating them upon completion.

There will be times as a commercial artist when it is difficult for you to come up with ideas. There will be other times when you are responsible for a project, but you are having difficulty managing the project. Understanding these creative problems solving models can help you understand where you are stumbling in creativity. Perhaps you did not conduct enough research, or perhaps you need to better define your goals.

Consider the creative problem-solving model as a road map. As you engage in the creative process, you can find yourself distracted or even lost. Because commercial art is an objective oriented discipline, you must keep yourself on course. If you study this road map, you can help yourself navigate through terrain with ease.

Self Education Exercises:

1. Consider a situation where you have been creative. It might involve solving a specific problem such as learning a new technology, or it might involve a repeated problem such as being late for class. Map your creative problems solving process to the Seven Universal Stages of Creative Problem solving model.
2. Conduct a post mortem on a project you completed in the last 2 weeks. Begin by describing the problem and your solution. Involve any of the people who helped you solve the problem. Write a half-page to one-page document outlining your success and points of improvement.
3. Draw a moment where you were exceptionally creative. Try to convey the moment of creativity in an interesting way. Instead of creating a comic book styled illustration of events, consider a collage or something even more creative.

Art Critique

Part of being creative is providing and accepting critique**.** Critique is serious, practical criticism. The term is used for the evaluation of an art student's work. Criticism is more than identifying fault with a work. It is the evaluation, analysis, and interpretation of a works of art. Criticism often focuses on three basic elements:

Content
Content is the general subject of the art. Content may describe the focus of the art from a practical standpoint. Content may also be described *what the art is about* or *what it depicts*. Much of the content of the documentary Fahrenheit 911 is American foreign policy. The content of Andy Warhol's Marilyn's, is the face of Marilyn Monroe.

Form:
Form refers to the structural elements of a work. A criticism of form focuses on the fundamental elements of any artistic construction. These elements include line, mass, value, color and so forth. Instead critiquing a photograph by writing that the building is the wrong place, a good critique would identify an unfavorably use of mass, or a distracting send of line creating by the building's placement. A critique might like the artist's use of color and the combination of hues.

Context
Context describes the circumstances under which the art was developed. When discussing context it is common to describe the work in terms of historical significance and audience perspective. For example, the animated feature film, The Beatle's Yellow Submarine had the social and historical context of a growing drug culture in the turbulent 1960s.

Sample Critiques

As with all writing, writing good critiques is encouraged by reading good critiques. The following are a few passages from quality critiques:

In 'Shot Marilyns & Gunbelt,' the theme of allegorical recycling is tied explicitly to landscape. As with 'Warhol at Wheatlands,' the landscape is viewed through the use of catachresis. The "sunset," contrasting with Marilyn's lips in 'On Andy Warhol's Baseball and Gold Marilyn Monroe,' is "tacky / & nothing special." The iconic value of the solar metaphor is replaced by the negative commercial value of an image which is apparently unaffected (and dysfunctional). However, Kinsella is quick to remind us that the "real" is not anchored in mere portrayals of landscape (or "crops [with] broken unglazed surfaces"). Significantly there are "[p]owerlines" that "hiss in the uneasy air– / like poems escaping from screen-prints," suggesting that the poem itself, like the industrial objects and "collectibles" that define the rural environment in terms of commodity pre-packaging, is already involved in a process of consumption.
-Written by ***Loius Armand***

Gatos' pose is perfect. I feel like he is very aware of the camera and is giving us a sophisticated pose only like a cat can.

Your choice of aperture, influencing your depth of field, was also ideal. Letting the background go entirely out of focus, allows all attention to be on Gato. If I was able to see the detail of the room in the background I am sure I would have been too distracted from the subject, which of course is Gato.

-Posted on the web at ***Cindy at 28thfloor.com***

Traditional Tools of the Artist

Traditional artists, or old media artists, use a variety of tools to create their art. Many of these tools are listed below. It is common for inexperienced artists to think that an understanding of traditional artists tools is not important to their success. This is simply not true. Consider the following facts:

- Traditional tools are the basis for modern tools. Computer programs use design metaphors. A design metaphor creates an analogy between the real world and the digital world. Using cut and paste or a paint bucket in a software program is analogous to using scissors or a paint bucket in the physical world. If you understand the traditional tools, you will have a better understanding of their digital counterparts on the computer.

- There is significant chance that you will be asked to use traditional artist's tools in your professional career. An animator may be asked to sketch storyboards and a graphic designer may be asked to mount a design for display.

- Computers are not always available. Sometimes artists travel as part of their research. Since it is not always reasonable to carry a laptop computer, a good commercial artist should be able to use and understand the essential traditional artists tools.

- Digital, or computer-based tools, are limited. They are limited by a person's ability to use them and they are limited in their uses. Interestingly, as an artists becomes more comfortable with a computer program they become more familiar with its short fallings.

These are just a few of the many reasons it is important to know and understand the traditional tools of the artist.

Traditional Tools of the Artist

The following is a list of traditional artists tools with which you may be familiar. If you are not familiar with the any of the items listed below they are easily introduced online by conducting a web search or by visiting your local art supply store:

T Square
Triangles
Compass

Pencil
Color Pencil
Pens
Drafting Pens
Compass
Paint Brush
Paints (watercolor, acrylic, oils)
Paint Pallet
Markers
Canvas

Sketch Pad
Trash Paper
Velum Paper
Foam Core Board
Cold Press / Hot Press Mat Board
Construction Paper

Photo Paper
Film
Development Canister
Dark Room

Ruler
X-Acto Knife
Metal Straight Edge

Clay, Marble, raw materials

Easel
Glue Stick
Hot Glue Gun
Spray Adhesive
Drafting Table
Tracing Paper

Gum Erasers

Advanced Tools of the Artist Described

Heat Gun / Drying Gun

Projects warm or hot air. Used for bending plastics, drying parts, heating parts, stripping paint, packaging (shrink wrap), jewelry crafting, and more.

Light Box

A simple box with a translucent top through which electric light is projected. The light box is a tool for tracing, viewing (negatives, image detail, etc), stenciling, lettering and stained glass. Often made of plastics and wood.

Magnifier

Magnifiers and magnifying lenses are used to inspect detail in graphic arts. Although available in several types (handheld, monocle, and desktop pictured).

Soapstone

Soapstone is a sculpting material that is usually grayish green or brown in color. It is a soft stone whose "soapy" feel gives it its name. Soapstone is a convenient sculpting material.

Sketch box easels

An easel that is designed to carry art supplies. Useful for travel.

Color wheels / Color charts

A tool to assist artists in color matching and blending. It describes various hues and their relationship.

Curves / French Curve

Guide for sketching curves used in design. Although the standard is the French curve set (pictured left) there are also flexible curves available. The typical curve is little more than a clear plastic template.

Air Brush

A device designed to spray pigments across a variety of surfaces (papers, fabrics, metals). The nozzle, or tip of the airbrush can sometimes be adjusted or replaced to define the pattern and density of the sprayed pigment. A compressor (pictured right) provides the force that propels the pigments. Most airbrushes use air for force.

Binding Tape (Books / Publishing)

A material used to bind books, reinforce pamphlets, repair covers, and mend loose pages. This is the material used in a *tape bind* low quality commercial binding process. Most binding tapes have an adhesive some require a secondary adhesive. Made of low quality resilient papers, fine papers and fabrics (linen, cotton, etc).

Charcoal Paper

Any of wide range of papers that have slight texture and light color. Charcoal papers can also include papers designed for use with pastels.

Drawing Board

Any of a variety of devices designed to facilitate easy creation of graphic design, architecture, or perspective drawings. Most have tools such as clamps to hold the paper in place, or straight edges for line drawing, that aid the artist.

Template

A pattern or set of patterns used as guide in creating specific shapes. The notion of a template is also borrowed in computer software, where a document template is a pre-built document that serves as a starting point (e.g. letter template, resume template).

Lettering Guides: a template for letters and characters

Vellum Paper

Vellum is a fine parchment made from calfskin, lambskin, or kidskin. It may be used for the pages of books or for quality work that you plan to keep for a long time. Hence, it is consider archival quality paper. Vellum papers tend to expensive. Not all vellum papers contain animal skins; others are created using plant material (although this is not a true vellum).

Foam Core Board

Any of a variety of materials used for sign making, presentations, and crafts. Core board is a stiff material comprised of at least two materials (the foam core and the outer surface). A few foam core boards are single sides (1 side foam, 1 side paper or similar); while others have a foam core encased by an outer shell. Foam materials may include polystyrene plastic (Styrofoam) or similar lightweight materials.

Cold Press Mat Board / Hot Press Mat board

Any of a variety of materials used for framing and accenting artistic materials. Cold press and hot press are described as self stick and requiring a heating element (heat gun or device).

Computer Overview

A painter should understand the various brushes, paints, and canvases available for their use, right? Likewise, any commercial artists should understand computers. Computers have become an extension of the commercial artist's creative process.

As such, understanding the fundamentals of computers is essential to your success as a commercial artist. Regardless of the creative industry, commercial artists must be more than comfortable with a computer. Computers are used to communicate, manage resources, and of course, create art.

When we discuss computers, we describe hardware and software. **Hardware** includes all of the physical components of a computer. A monitor, a printer, and a mouse are all hardware.

Software includes all of the programs that use the hardware. Software is written by computer programmers. The goal of software is to help a computer user make use of the hardware in the computer.

Hardware:

As an artist, it is important for you to understand how the computer works. You may need to purchase and troubleshoot a computer for your own use. Other times your creativity may have technical limitations imposed by the computer's hardware. An understanding of computer hardware will help reduce your stress when technical problems occur, improve the quality of your art, and help you to be a more productive artist.

Computers come in a wide variety of forms. There are small computers embedded in our cars and appliances, and there are very powerful computers used by the government for solving enormous problems. Video Games consoles like the Nintendo Game Cube are computers. So too are handheld devices like a Palm Pilot.

Most people have had some contact with a personal computer. This is the kind of computer on which people play games, surf the web, or write e-mail. Personal computers have been available for just under 30 years. They were popularized by the Apple computing company in the early 1980s, and have since become ubiquitous. Popular manufacturers of personal computers include Alienware, IBM, Hewlett Packard, Sony, and Toshiba. The personal computer has become so common that most artists cannot imagine life without them.

Artists create their artwork on the computer. They also manage their collection, communicate their ideas, and conduct research on their personal computer. Learning activities, such as online classes, and computer based training and testing enhance and direct an artist's education. Some artists also keep tools for inspiration on their computers: pictures, movies, music and relate media.

However, the personal computer is not the only type of computer an artist uses. Sometimes personal computers do not have enough computing power to accomplish the tasks of an artist. Instead, more powerful pieces of hardware are used as a general resource by a creative team. These computers include servers, mid-range systems, and super-computers. Large companies, such as Pixar Animation and PDI DreamWorks, use these more powerful computers to create movies like Toy Story and Shrek.

Regardless of the amount of computing power, every computer has a few basic hardware components. These are a central processing unit, memory, and storage.

The Central Processing Unit (CPU)

The central processing unit, or CPU, is the piece of hardware that does the "thinking." All computers communicate information mathematically, using a number language known as binary. Binary is a way of communicating anything via a combination of 0's and 1's. The CPU's sole responsibility is to calculate the 0's and 1's.

A CPU may is called the chip by some people. A chip is really any hardware component designed for computational tasks. For example, someone may refer to a graphics chip or audio chip. These chips are small pieces of hardware specifically designed for the computation occurring in graphics display or audio playback. The CPU is thus the main chip, responsible for all general computation.

The leading manufacturers of CPUs are Intel and AMD. These companies make the CPUs and sell them under names that help people remember them. For example, you may purchase a computer with a Pentium "chip" or a "Celeron" processor.

Memory

The CPU gets its information from the memory. In personal computers, this memory is called random access memory, or RAM. RAM is temporary. It can hold information only as long as there is electricity in the computer. As soon as the computer is turned off, or power is lost, the RAM is emptied.

RAM is available in many formats. Just as there are many companies that sell CPUs, there are many companies that sell RAM. RAM is available in deferent formats, such as SRAM, DRAM, DDRAM etc. For our purposes, you need only understand memory's function, not the differences between RAM types.

Storage Devices

Of course, a computer can save information when it is turned off. It does so through its storage devices. The most common storage device is a hard drive. Other storage devices include CD drives and DVD drives. Storage devices are permanent storage, intended for the long-term retention of information. Storage devices, such as a hard drive; provide the information to RAM, which in turn forwards the information on to the CPU.

If you wanted to edit a picture on a computer the chain of events in the computer's hardware are roughly as follows:

- Identify the picture on the hard drive or other storage device.
- Load the picture from the storage device to the RAM.
- The picture is processed in the CPU, by loading it from RAM.

This is very similar to an assembly line. In an assembly line, each person has a responsibility. Here the storage device must hold the picture for safekeeping. The storage device moves slowest, but it is reliable. The RAM moves quickly but it cannot hold as much as the storage device. The CPU moves fastest of all, but it can hold the least amount of information at one time. Therefore, it is the RAM's responsibility to get the information from the storage device, and then give the CPU as much information as the CPU can hold.

While this is a simplified version of all the intricacies of computer's main hardware operations, it will prove helpful in your future understanding of computer software.

It is important to understand all of the major topics in computer hardware. On subsequent pages, you will find a list of a computer hardware terms and their definitions. Glance through this list and make note of new terms or components. You can review these components in class, on the Internet, or by visiting your local electronics retailer

Activities:

1. Open a picture file on your computer and try to imagine each of the processes as they occur. Many computers have a hard drive light that indicates when the hard drive is a being used. Try to note how infrequently the hard drive is being used. On older computers you will notice that the hard drive is used far more often, or when a file is large (such as a music video or a movie) the hard drive gets far more work than when you type up a paper for class.

2. Try to create an analogy for the different hardware components within a computer. For example, some people refer to the CPU as a brain. Create a drawing that describes each of these components in a related way.

Software:

Software is a tool. Software's sole purpose is to make use of the hardware on your computer. Software is commonly referred to as programs or applications on your computer. The applications are what the computer user uses. You may have never seen a hard drive but you may have seen and used Microsoft Word, Corel Word Perfect, Internet Explorer, FireFox, or the QuickTime player. These are software applications that allow users to write documents for printing, surf the web, or listen to music on the computer. Each program makes use of the essential hardware on our computers: hard drive, monitor, printer, etc.

The most important piece of software on a computer is the operating system. An operating system manages the hardware on a computer. It makes sure that the hard drive is not overworked, that RAM is doing its job, and that images appear correctly on the monitor. In this way, the operating system is also a users main point of interaction with the computer. If you use a mouse to click on something, or a touch screen to select an item, you are using an operating system to interact with the computer.

The point at which a user interacts with a computer is called the **interface**. The earliest computers had interfaces based on knobs and switches. Later operating systems used monitors, but still required a user to type commands instead of clicking on pictures, icons, and more familiar visualizations. Nowadays computers use a Graphical User Interface, or GUI (pronounced Goo-ee). Apple Macintosh interfaces were some of the earliest GUI interfaces. Windows operating systems, as well as others, are currently graphical.

Graphical user interfaces are more closely aligned to the way people think. Psychologists agree that symbols can be a simple way to communicate information. Symbols for an example can be understood by similar cultures that speak different languages. Think about all the symbols you see at an airport or a tourist location. Indications for bathrooms, help, and directions use a symbolic language that is common to many different cultures. A graphical user interface exploits this to make a computer easier to use.

Several types of commercial artists spend their time researching and developing combinations of colors, shape, and lines to communicate. Whether it is designing icons as a part of an interface, creating a sign system for a commercial space, or creating whole systems to describe a game player's inventory, artists utilize the fundamental concepts of a GUI operating system to make our lives more enjoyable. There are also whole branches of science that help artists make informed decisions about their aesthetic designs. These sciences include human computer interaction and linguistics.

Software Use

It is important to remember that software is written by human beings for human beings. The people who write software sometimes make mistakes, known as bugs, but they are always trying to make a program easy to use. This concept is called usability. If a program is usable, then it is said to have high usability. Since the only reason programs exist is to be used, a good program must have high usability. Usability is a product of psychology, sociology, aesthetic design and

engineering. People who design software study usability by watching users, evaluating their needs, and design toward those needs.

A person who writes programs is called a software programmer. Many commercial artists are involved in some level of software programming. Interestingly software is created by using another piece of software. For example, a very popular piece of software, called Flash, is used to create web sites, interfaces, and animation. Flash has a programming language that many artists like to learn. By knowing, the programming language artists can enhance their design and make them more interactive.

Even if you have never used a computer, you have probably used software. Most video games, for example, are software. The Sony Playstation uses programs stored on CD, while Microsoft's Xbox uses programs stored on DVD. For every game, there is a user interface, and there are multiple software programmers that created it. When you use an ATM, an automated check-out, an informational kiosk you are using software. Of course, you must also remember that while the software may be written by programmers, the interface was likely designed by artists.

Software Types

Given the complexity and varied uses of modern software it is impractical to try to divide software into specific categories. Many programs can be used in a variety of ways that extend beyond simple definitions. As an artist, you should understand that anything can be used creatively, and the creative use may not be its intended use.

However, it is useful to understand the general categories under which software functions can be defined. These are as follows:

Word Processing:
Any program designed for authoring written documents. The most common word processors are Microsoft Word and Corel WordPerfect.

Business Productivity
Any program designed for a specific business use. These include business presentations, managing financial information, and communicating within an office. Microsoft Excel, Lotus 1,2,3, Microsoft PowerPoint, Microsoft Visio, Microsoft Outlook, and Thunderbird.

Interactive Media
Any program designed to facilitate development of an interactive media. This includes software designed to create web pages, video game interfaces, and other such products. Macromedia Dreamweaver and Macromedia Flash are the leading products in this category.

Animation, Special Effects, and Video
Any program designed to help create, edit, or refine moving images. These programs may facilitate the creation of digital animation, the combination of a digital animation with traditional animation, or editing of traditional "live action" video. Leading programs in this category include Adobe After Effects, Maya, and SoftImage.

Layout and Print Design
Layout programs help people to create effective print media. These programs allow users to edit designs on the computer with the specific goal of printing and distributing them in on a physical medium. The most popular product in this category is Quark.

Image manipulation
This category includes any program designed for the manipulation of still images. Still images include photographs and illustration. Adobe PhotoShop, Adobe Illustrator, and Macromedia Freehand are the most common programs in this category.

Software Common to All Artists

Although some of these program categories meet a very specific need, others are common to all artistic and non-artists endeavors. Artists, and non-artists alike, will need to send e-mail for example. Likewise, most artists like to have some type of web design expertise because the web is a wonderful way to publish your portfolio and allow potential clients to find you.

As such, it is important for all artists to understand the following programs:

PhotoShop:
Used for image manipulation. Correcting or enhanced an image on the computer is exceptionally easy when compared to the old media processes. All artists find it useful to be able to edit an image they have created. Sometimes it's as simply as cleaning up an image of themselves for a press photo, other times it's as complicated as creating special effects for a movie.

Microsoft PowerPoint:
Microsoft PowerPoint is the most widely used presentation software in the United States. It allows a user to create professional slide shows that can be displayed on a big screen via the computer. Knowing PowerPoint can help an artist make professional presentations.

Microsoft Word / Corel WordPerfect
Microsoft word is the most widely used word processing product in the United States. Every commercial artist will maintain a list of portfolio pieces and a their resume. Clean, professional looking resumes are created by being very familiar with Word Processing software like Word and WordPerfect.

Dreamweaver and Flash
Dreamweaver, and its compliment, Flash, are great tools for authoring web pages. Dreamweaver is designed to work much like a word processor. It creates web pages that can be viewed by nearly everyone who surfs the web. Flash, is a slightly more complicated tool that allows its users to create web pages, animations and interfaces. Flash requires slightly more training, and a smaller population of web surfers can view its web pages.

As mentioned before, keep in mind that few programs fit neatly into a single category. It is possible, for example, to create web pages using Microsoft Word or PowerPoint. The goal is for you to understand the purpose and best use of a software application. Remember, software is a tool. You might be able to drive a nail with a wrench, but a hammer is much better suited for the job.

Activities:

1. Open the command prompt on a Windows 2000 or newer computer. It is typically listed under the accessories folder. The command prompt is a glimpse into the past. It is a copy of the interface used by Microsoft's non-GUI interface, called MS-DOS.

2. Try to run a command. Type "dir" and hit the enter key. Notice that a long list of folders and files scrolls by. If you want to see the list page by page, you must type "dir /p". Notice that if you did not know about "dir /p", it would be much harder for you to figure out how to read the information on the computer. If you type ".." you can move up one folder. If you type "cd " and the folder's name you can move down one folder. The MS-DOS interface is much less intuitive than modern GUI interfaces.

Being a Tech Savvy Artist

You might remember that an understanding of hardware will make you better at using software. But how?

Software is limited by the hardware on the computer. Programs on your computer are stored on the hard drive. When you run a program, it must be moved from the hard drive to the RAM, so that the CPU can process its instructions.

It is important that you understand this relationship. If you find a program runs too slowly on your computer you can begin to troubleshoot the problem once you understand this. For example, if you notice that your hard drive is running frequently while you wait, it is probably an indication that either your CPU is too slow, or you have too little RAM.

You also need to understand the relationship of software and hardware when shopping. While hardware requirements are routinely stated on the software company's web site or their packaging, knowing the minimum is not quite enough. Imagine that want to buy a quality piece of animation software. You've found out that the your computer does meet all the requirements to run the software. However, after you install it, you find out that it runs very, very slowly. At this rate, it will take you far too long to get your animation project done. What do you do?

First, if you understand that all programs must run through RAM, you should make sure your RAM is as empty as possible. If you have more than one program running, your RAM might be storing information for those other programs. Begin by closing any of the unused, open programs.

Next, you will have to understand that RAM has less capacity than your hard drive. To accommodate this, your computer fills the RAM, sends information to the CPU, and then swaps more information from the hard drive. Any partially processed information is stored temporarily on the hard drive, to accommodate for the shortage of RAM capacity. That means that a clean hard drive, with more space, and a fast operating speed can help your animation program run more quickly.

While much of this may not be instinct to you know, as you become experienced you will learn to solve problems this way. Again, keep in mind your creative problem solving process and the fact that commercial artists can expect to work with brand new technologies – some of which have never been pushed to the limits you require.

Buying a computer

Ultimately you will be responsible for purchasing, or suggesting for purchase a computer to meet your artistic needs. It is far more valuable for you to understand the concepts and terminology than to know the specifics of what CPU is best. In a few months, there will be better hardware and software than there was. Your task is simply to examine your needs and estimate the changes in your needs.
It is helpful to know that the most computationally intensive activities require video, animation, and audio manipulation at high qualities. Software related to video editing software, animation and video gaming requires the most of a personal computer's resources. Creating print layout,

designing for websites, and manipulating still images requires a moderate level. While business productivity, activities and Internet browsing require the least computing power.

It is a good idea to start identifying resources you will use to keep abreast of a technology. There are several quality publications, so the choice is really one of taste. There are also a few good resources on the web. It is best to talk to industry professionals, instructors, or the technical support people at your school or work to find some good resources and advice.

Activity:

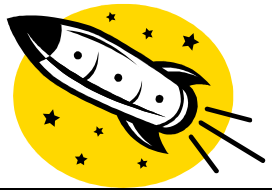
Shop online or at a local retailer for a computer. Compile a list of three computers. The first computer is the best computer you have found regardless of price. The second computer is the best computer you think you can afford. The third is the lowest priced computer that you think will meet your needs as an artist. You should get used to this activity, as you will do this several times in your artists career.

Understanding Visual File Formats

Artists routinely manipulate images on a computer. An image can be created on the computer using one of two standard types of formats. Specific software applications use either **vector graphics** or **bitmap graphics**.

Vector Graphics:

Vector graphics are graphics created by putting many individual shapes together. Vector graphics programs are usually called "drawing" programs. They are based on the idea that one picture can often be broken down into a set of simple shapes. Consider the following example:

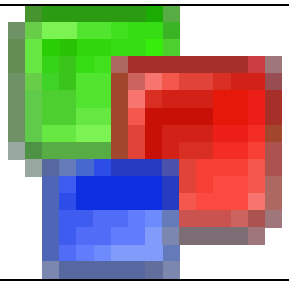
	
This whole drawing can be broken down into several distinct shapes.	*The same drawing, with a few of the basic shapes split apart.*

Vector graphics are sometimes called object-oriented graphics because they use these objects, or shapes, to create an image. Vector graphics can be enlarged and shrunken without losing image quality. Vector graphic file formats include encapsulated postscript (eps), Adobe format (ai), and Windows metafile format (.wmf).

Bitmap Graphics

A bitmap image is created by mapping pixels to specific locations on the screen. Bitmap graphics programs are usually called painters. Bitmap file formats include tag image file format (tiff), .Joint Photographic Experts Group format (jpg), and graphic interchange format (.gif). Bitmap files do not scale well because the software that displays the graphic must interpret where individual pixels should be when the image is shrunken or expanded.

Example of Bitmap scaling

	
Original Image	*Image expanded - notice graininess and blur.*

Adobe PhotoShop Features

Adobe Photoshop is one of the most popular static image manipulation applications in the world. Every visual artist should be familiar with its functions.

Photoshop allows its users to create original images or modify photos using a full assortment of painting, drawing, and retouching tools. Users can create image animations for the web, retouch images, and create new images.

Layers
The fundamental unit of operation in Photoshop is the layer. Layers allow the compositing of images, text and effects. A Photoshop document can have hundred of layers. With layers a user can save and manipulate variations of the same composition.

Filters and Effects:
Photoshop allows users to perform hundreds of visual effects. These effects include such transforming an image to a charcoal rendering, adding a drop shadow, blurring content and producing other traditional art imitations.

Sample of applying a watercolor effect

Artistic brushes and Fine Art Tools
Photoshop simulates traditional fine-art techniques with dry and wet brush effects, pastel, charcoal, and more. Images can be smudged, lightened and colored similar to traditional art techniques.

Color correction
Photoshop provides tools to improve the color, contrast, and dynamic range of any image with a comprehensive set of professional color-correction tools.

Software and the Internet

The Internet has greatly increased the availability of software around the world. It has also made the acquisition of software slightly more dangerous. You have no doubt heard of virus outbreaks or even spy ware and adware. This section seeks to clarify some of these terms for you:

Virus

A virus is any piece of code writing by a programmer to cause harm to a computer. A virus can be provided through e-mail, from a web page, or as part of another piece of software. The best protection against viruses is care and caution. Always maintain your virus protection software, do not visit web pages with unsavory content, and do not open e-mails from unfamiliar senders.

Viruses come in many forms including, worms, Trojan Horses, macros, and general vulnerabilities. Each of these terms describes how the virus is distributed.

Spyware

Spyware is a relatively new type of software designed to record information about the user of a victim computer. While not all spyware has malicious intent, many people consider it an invasion of privacy. Because most spyware is written carelessly, spyware can slow a computer down, or cause lasting damage.

Adware

Adware is any software design to provide advertising along with its core functions. Adware is typical of low cost or free programs that seek to supplement the developer's income through advertising revenue. In agreement for using the software, an adware user agrees to receive provided advertising. Many adware programs are coupled with spyware.

Freeware / Shareware/ Open Source

These terms are used to define any type of software that is offered for free use under specific terms. The loosest terms are often provided in freeware. With freeware, there are little or no limitations to use or distribution. With shareware, distribution is often restricted, and use may be limited to a specific amount of time, or to a portion of the total program's functionality. Open source software referees to software that allows its users to modify the programming to improve it.

Reference Materials

U.S. Department of Labor Report Artist and Related Workers

Artists held about 149,000 jobs in 2002. More than half were self-employed. Of the artists who were not self-employed, many worked in advertising and related services; newspaper, periodical, book, and software publishers; motion picture and video industries; specialized design services; and computer systems design and related services. Some self-employed artists offered their services to advertising agencies, design firms, publishing houses, and other businesses on a contract or freelance basis.

Training requirements for artists vary by specialty. Although formal training is not strictly necessary for fine artists, it is very difficult to become skilled enough to make a living without some training. Many colleges and universities offer programs leading to the Bachelor in Fine Arts (BFA) and Master in Fine Arts (MFA) degrees. Course work usually includes core subjects, such as English, social science, and natural science, in addition to art history and studio art.

Evidence of appropriate talent and skill, displayed in an artist's portfolio, is an important factor used by art directors, clients, and others in deciding whether to hire an individual or to contract out work. The portfolio is a collection of handmade, computer-generated, photographic, or printed samples of the artist's best work. Assembling a successful portfolio requires skills usually developed in a bachelor's degree program or through other postsecondary training in art or visual communications. Internships also provide excellent opportunities for artists to develop and enhance their portfolios.

Artists hired by advertising agencies often start with relatively routine work. While doing this work, however, they may observe and practice their skills on the side. Many artists freelance on a part-time basis while continuing to hold a full-time job until they are established. Others freelance part time while still in school, to develop experience and to build a portfolio of published work.

Employment Outlook

Employment of artists and related workers is expected to grow about as fast as the average through the year 2012. Because the arts attract many talented people with creative ability, the number of aspiring artists continues to grow. Consequently, competition for both salaried jobs and freelance work in some areas is expected to be keen.

Art directors work in a variety of industries, such as advertising, public relations, publishing, and design firms. Despite an expanding number of opportunities, they should experience keen competition for the available openings.

Median annual earnings of salaried art directors were $61,850 in 2002. The middle 50 percent earned between $44,740 and $85,010. The lowest 10 percent earned less than $32,410, and the highest 10 percent earned more than $115,570. Median annual earnings were $67,340 in advertising and related services.

Median annual earnings of salaried fine artists, including painters, sculptors, and illustrators, were $35,260 in 2002. The middle 50 percent earned between $23,970 and $48,040. The lowest 10 percent earned less than $16,900, and the highest 10 percent earned more than $73,560.

Median annual earnings of salaried multi-media artists and animators were $43,980 in 2002. The middle 50 percent earned between $33,970 and $61,120. The lowest 10 percent earned less than $25,830, and the highest 10 percent earned more than $85,160. Median annual earnings were $58,840 in motion picture and video industries.

U.S. Department of Labor Report
Graphic Designers (Subset of Designers)

Designers are people with a desire to create. They combine practical knowledge with artistic ability to turn abstract ideas into formal designs for the merchandise we buy, the clothes we wear, the Web sites we use, the publications we read, and the living and office space we inhabit. Designers usually specialize in a particular area of design, such as automobiles, industrial or medical equipment, home appliances, clothing and textiles, floral arrangements, publications, Web sites, logos, signage, movie or TV credits, interiors of homes or office buildings, merchandise displays, or movie, television, and theater sets.

Graphic designers plan, analyze, and create visual solutions to communications problems. They use a variety of print, electronic, and film media and technologies to execute a design that meet clients' communication needs. They consider cognitive, cultural, physical, and social factors in planning and executing designs appropriate for a given context. Graphic designers use computer software to develop the overall layout and production design of magazines, newspapers, journals, corporate reports, and other publications. They also produce promotional displays and marketing brochures for products and services, design distinctive logos for products and businesses, and develop signs and signage systems—called environmental graphics—for business and government. An increasing number of graphic designers are developing material for Internet Web pages, computer interfaces, and multimedia projects. Graphic designers also produce the credits that appear before and after television programs and movies.

Graphic designers	212,000

Training

Creativity is crucial in all design occupations. People in this field must have a strong sense of the esthetic—an eye for color and detail, a sense of balance and proportion, and an appreciation for beauty. Designers also need excellent communication and problem-solving skills. Despite the advancement of computer-aided design, sketching ability remains an important advantage in most types of design, especially fashion design. A good portfolio—a collection of examples of a person's best work—often is the deciding factor in getting a job.

A bachelor's degree is required for most entry-level design positions, except for floral design and visual merchandising.

Formal training for some design professions also is available in 2- and 3-year professional schools that award certificates or associate degrees in design. Graduates of 2-year programs normally qualify as assistants to designers, or they may enter a formal bachelor's degree program. The Bachelor of Fine Arts degree is granted at 4-year colleges and universities. The curriculum in these schools includes art and art history, principles of design, designing and sketching, and specialized studies for each of the individual design disciplines, such as garment construction, textiles, mechanical and architectural drawing, computerized design, sculpture, architecture, and

basic engineering. A liberal arts education or a program that includes training in business or project management, together with courses in merchandising, marketing, and psychology, along with training in art, is recommended for designers who want to freelance.

Individuals in the design field must be creative, imaginative, and persistent and must be able to communicate their ideas in writing, visually, and verbally. Because tastes in style and fashion can change quickly, designers need to be well read, open to new ideas and influences, and quick to react to changing trends. Problem-solving skills and the ability to work independently and under pressure are important traits. People in this field need self-discipline to start projects on their own, to budget their time, and to meet deadlines and production schedules. Good business sense and sales ability also are important, especially for those who freelance or run their own business.

Employment Outlook

Overall, employment of designers is expected to grow about as fast as the average for all occupations through the year 2012 as the economy expands and consumers, businesses, and manufacturers continue to rely on the services provided by designers. However, designers in most fields—with the exception of floral design—are expected to face keen competition for available positions. Many talented individuals are attracted to careers as designers. Individuals with little or no formal education in design, as well as those who lack creativity and perseverance, will find it very difficult to establish and maintain a career in the occupation.

Salary Description

Median annual earnings for graphic designers were $36,680 in 2002. The middle 50 percent earned between $28,140 and $48,820. The lowest 10 percent earned less than $21,860, and the highest 10 percent earned more than $64,160. Median annual earnings in the industries employing the largest numbers of graphic designers were as follows:

Advertising and related services	$39,510
Specialized design services	38,710
Printing and related support activities	31,800
Newspaper, periodical, book, and directory publishers	31,670

The American Institute of Graphic Arts reported 2002 median annual earnings for graphic designers with increasing levels of responsibility. Staff-level graphic designers earned $40,000, while senior designers, who may supervise junior staff or have some decision-making authority that reflects their knowledge of graphic design, earned $55,000. Solo designers, who freelanced or worked under contract to another company, reported median earnings of $55,000. Design directors, the creative heads of design firms or in-house corporate design departments, earned $85,000. Graphic designers with ownership or partnership interests in a firm or who were principals of the firm in some other capacity earned $93,000.

U.S. Department of Labor Report

Visual Communications, Advertising Managers:

Advertising, marketing, promotions, public relations, and sales manager jobs are highly coveted and will be sought by other managers or highly experienced professionals, resulting in keen competition. College graduates with related experience; a high level of creativity, and strong communication skills should have the best job opportunities. Employers will particularly seek those who have the computer skills to conduct advertising, marketing, promotions, public relations, and sales activities on the Internet.

Employment of advertising, marketing, promotions, public relations, and sales managers is expected to grow faster than the average for all occupations through 2012, spurred by intense domestic and global competition in products and services offered to consumers. However, projected employment growth varies by industry. For example, employment is projected to grow much faster than average in scientific, professional, and related services such as computer systems design and related services and advertising and related services, as businesses increasingly hire contractors for these services instead of additional full-time staff. On the other hand, little or no change in employment is expected in many manufacturing industries.

Sales managers	343,000
Marketing managers	203,000
Advertising and promotions managers	85,000
Public relations managers	69,000

Median annual earnings in 2002 were $57,130 for advertising and promotions managers, $78,250 for marketing managers, $75,040 for sales managers, and $60,640 for public relations managers. Earnings ranged from less than $30,310 for the lowest 10 percent of advertising and promotions managers, to more than $145,600 for the highest 10 percent of marketing and sales managers.

New Media Software List

Authoring/Multimedia:
Visual Basic, IconAuthor, Quest, mTropolis, QuarkImmedia, MediaForge, HyperCard, Toolbook, Authorware, Director, Flash

Animation & 3D Software:
3D Studio MAX, Ray Dream Studio, Bryce, Poser, Detailer, Extreme 3D, Animation Master, Alias/Wavefront Maya, Lightwave 3D, SoftImage, Truespace, StrataVision 3D, LogoMotion, Infini-D, US Animation, Flash.

Digital Imaging:
Freehand, Illustrator, CorelDraw, CorelPaint, PicturePublisher, Photoshop, AlienSkin, Kai's Power Tools, Gallery Effects, Paint Alchemy, Painter, Painter 3D, X-Res, Designer, Canvas, DeBabelizer Pro, Fireworks.

Digital Video:
MediaStudio Pro, QuickTime, Media 100, Video Toaster, Quantel, Henry & Harry, Flame, Smoke, Avid VideoShop, Premiere, After Effects, Elastic Reality, Ulead Media Studio Pro, Digital Video Producer.

Page Layout:
Word, Works, PageMaker, QuarkXPress.

Sound Editing:
Sound Forge, Sound Recorder, WaveStudio, AudioTrax, Sound Edit 16, Cool Edit, CakeWalk.

Web Development:
BBEdit, PageMill, PowerMedia, Fusion, Web 3D, Oricle, HTML, FrontPage, GoLive, DreamWeaver, Flash, Director.

Computer-Aided Design Software:
Pro Engineer, AutoCAD, VersaCAD, CADKEY

Free Software List

Graphics:

Persisitence of Vision Ray Tracer (aka Pov Ray)
http://www.povray.org/

Irfanview Graphics Viewer
http://www.irfanview.com/

ACDSee Graphics Viewer
http://www.acdsee.com

HTML Editors:

Ace HTML
http://freeware.acehtml.com/

HoytSoft's Visual HTML (Beta is Free)
http://www.hoytsoft.org/beta/index.asp

The W3C's **Amaya**
http://www.w3.org/Amaya/

Other:

Avid Free DV
http://www.avid.com

Auto Desk Free Trial Software
http://usa.autodesk.com/

SoftImage EXP
http://www.softimage.com/products/exp/v3/download/