THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DIVISION OF ARTS AND HUMANITIES

# AN ARGUMENT FOR THE IMPROVEMENT OF DRAFTSMANSHIP TRAINING IN UNIVERSITY LEVEL FINE ARTS PROGRAMS, WITH SUGGESTED SYLLABUS AND COURSEWORK

ANDREW MCMANUS

SPRING 2011

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Art
with honors in Letters, Arts and Sciences

Reviewed and approved* by the following:

Bonnie Levinthal
Associate Professor of Visual and Integrative Arts
Thesis Supervisor

Yvonne Love
Senior Lecturer of Art
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

**Abstract**

The criteria for evaluating the value of a work of art have changed dramatically since the renaissance. Beauty and craftsmanship used to be a major part of what imparted value to an artwork, but now their importance has been eroded to the point that it they are optional or even actively discouraged. The modernist revolution resulted in their being replaced in large part by two things: the valuation of novelty, and the individualistic expression of the artist.

The educational model of the French Academies was largely incompatible with modernist dogma, and it collapsed. The vacuum in professional art education was filled by the Bauhaus model, based upon studying the discrete elements of art, and constructing novel, self-expressive forms from scratch. This model persists as the overwhelming standard at current accredited schools.

This has resulted in college art programs that largely disregard basic draftsmanship, which paradoxically undermines the stated goal of self-expression; how can a student communicate his message if that message relies on accurate drawing? It is also disturbing because it is not acceptable in any other discipline to routinely graduate students who are not proficient in the rudiments of their field.

The ability to accurately represent nature has been a foundational skill and one of the primary goals throughout the entire history of the visual arts. Students provided with solid drawing skills and a sound theoretical grounding are better equipped to realize their full artistic potential. Strong draftsmanship, sound technique and theory should be included in the foundational training for university-level students of visual art, because they *are* the foundation of visual art.

While excellent training in representational draftsmanship is available, it is largely confined to smaller, non-accredited institutions. This training is less accessible for potential students for financial and societal reasons. The gap needs to be bridged between the vast

majority of university art students and access to training in representational draftsmanship, because even though the student might not want to create representational art an understanding and respect for draftsmanship and craft are necessary for a well-rounded education in the visual arts.

The solution is to reintegrate and strengthen the extant basic draftsmanship training in college settings, and to equip students with techniques and theories that they can use in their work (even if it is highly conceptual and less reliant on representation). The sample course does this by teaching students the most powerful techniques of accuracy and illusion, addressing specific common weaknesses, and equipping students with self-critical problem solving skills. It is comprised of lectures, visual demonstrations, and practical application exercises. The course can be incorporated in whole or in part by educators. It can also be completed as an individual, or used as a reference.

**Table of Contents**

**Acknowledgments**

I would like to take this opportunity to give special recognition to a few individuals that provided me with extraordinary help in preparing this paper.

I owe a great debt to Bonnie Levinthal, for providing excellent guidance, keeping me out of my comfort zone, and encouraging my application to the Honors College. I am also indebted to Yvonne Love, for her excellent guidance as well, but more importantly for her being an outstanding example of what a conceptual artist should be. These two extraordinary teachers provided me with an appreciation and understanding of contemporary art that kept me from going off the deep end with technique and losing sight of the bigger picture.

I owe thanks to Jon deMartin, consummate draftsman, for breathing new life into the techniques of the old masters and tirelessly propagating them across the country. I must also acknowledge the same excellent craftsmanship and generosity of knowledge of the entire staff of Studio Incamminati.

I owe so much to my Love, Lauren Courtright, for being my best friend, sounding board, and perfect foil, and for making each year the best of my life, over and over.

And lastly, to my Mom, who taught me how to have fun and work hard, and my dad who taught me how to work hard and have fun. Their generosity and support have allowed me to do things that would have been impossible without them, and all of my future accomplishments are theirs.

# Part I: Background

## Historical Review and Context

*Representation: Pre-Renaissance to the Academy*

Observing and accurately representing nature is fundamental to visual art. Since the first artists painted on cave walls over thirty millennia ago, knowledge, theory, technique and materials have been evolving. This progression has given artists an ever improving toolkit with which to represent the natural world.

Advances in scientific understanding in the fields of optics have given artists insight into the behavior of light. Research into the brain and the senses has taught artists about the function of the eye and perception. Photography has allowed the capture of visual moments and the study of fleeting phenomena. Most recently, computers have allowed for post-processing, manipulation and compositing of digital photographs, as well as realistic 3-D modeling. These advances, among others, have expanded the knowledge upon which artists can build a successful picture.

Advancements in scientific understanding, and information capture and processing have been matched by advancements in artistic materials. Breakthroughs like the advent of oil painting, the industrialized manufacture of graphite pencils, and advances in pigment science and coating technology have given artists more permanent, consistent and powerful tools capable of better reproducing nature. Each year paint manufacturers introduce pigments that are more permanent and more intense, giving artists an ever-expanding gamut of color to work with. Acid-free paper and new conservation techniques have given works on paper an indefinite life-span, while space-age painting supports, purified materials and new resins have done the same for paintings (Mayer 282, 400-20).

Artistic training has matched this trend of continual improvement. Methods have developed and evolved that reliably equip students with powers of observation and technical

mastery related to the faithful reproduction of what they see. The evolution of artistic training can be easily traced through history.

During the early Renaissance, painting was considered a craft, and was taught by a master craftsman to student/workers in his studio, much like a cabinet maker would train his apprentices (Aristides, “Classical Drawing Atelier” 4-5). Since it was a craft, art with a practical purpose, there were objective criteria that had to be met for a work to be considered successful. In the same way that a wobbly table is a failure, a painting failed if it did not communicate the patron's message.

The way in which a painting communicated its meaning was also important; it was supposed to reflect the beauty of nature, either through realistic representation, symbolism or abstraction. The success of a work of art was dependent on the subject matter, the meaning of the piece and its beauty. Since the environment favored good craft over poor craft, the shops that could produce the most successful paintings prevailed, and draftsmanship was taught to the highest standards as a matter of course.

During the High Renaissance, certain artists gained individual notoriety, like Leonardo Da Vinci and Raphael, and the celebrity of the individual artist began to add value to a work of art. The same painting would be 'worth' more if it were painted by Leonardo Da Vinci instead of one of his pupils. This trend toward artistic celebrity was accompanied by a shift in the the model of artistic training; painting became less of a craft, with craftsmen creating objects with a specific function, and more of an art. The workshops changed into or were overtaken by a new model: a master-supervised working art studio.

In these studios, individual artists created novel work while training their student/assistants. This model retains the implied normalcy concerning the teachability of drawing and painting, while at the same time valuing individuality and art for art's sake.

Expression, creativity and the communication of feeling were the final goals to be achieved, in large part, after one's basic training was completed under a working master. As with the workshop model, the final goal of artistic training was the creation of beautiful, meaningful, well-crafted paintings. This most basic arrangement, a master training apprentices, was the basis for the Academies.

*The Rise and Fall of the Academy*

The Academies were larger, more permanent and formal institutions of artistic training that were prevalent throughout Europe from the mid-17th century until the beginning of the 20th. They can be thought of as the Renaissance master's studio scaled up, with many working master artists supervising a larger number of students. Although they were often headed by a single prominent artist, the institution persisted under another master after they were gone. In other words, while the studio school of Rembrandt ended with the artist's death, the Academies outlived individual artists.

The academies had a different aesthetic than most Renaissance artists, but they still placed heavy emphasis on learning basic skills. (Aristides, “Classical Drawing Atelier” 7). The academies of the 17th through 19th centuries still stressed meaning, craft and beauty; even though the purpose of the works, the methods in which they were executed, and the prevailing aesthetic had all shifted ,the basic criteria by which a work of art was judged remained fairly similar to that of the Renaissance.

Academic training reached its zenith in the French Academies, like the École Nationale Supérieure des Beaux-Arts, a national art academy that traces its founding to 1648. (Aristides, “Classical Drawing Atelier” 6). These schools emphasized skills in drawing and highly finished

painting[1] as a vehicle for communication. They had a strong and deeply ingrained aesthetic, and held to a rigid hierarchy of genres, with grand-manner history paintings at the top. They looked to Classical themes, myths and stories as references for their paintings. They idealized their figures, basing their design of the human body in large part upon that of the Ancient Greeks.

Along with the classically-idealizing aesthetic and subject matter, the the process for making a painting also became very formalized. First, an artist would make preparatory sketches, both drawings and oil-sketches (called “esquisses”). They would then transfer this information to their canvas in-studio and bring the work to a high level of finish (Meyers).

Despite the outstanding level of craft achieved, academic training had a few things going against it. First, they had a lot of institutional inertia. The faculty and judges at the Salons (major juried exhibitions) knew what they liked and rejected what they did not. This resulted in many years of very similar painters and paintings. Second, academic art required a high level of skill, requiring much patience and hard work from their students. Third, although the paintings themselves were beautiful, the subject matter could be inaccessible for common people. It could even be argued that although the Academies represented giant leaps forward in certain areas of artistic training, they also represented something of a backslide toward the more anonymous, similarly trained working artists of the workshop model.

This stagnancy of style and subject matter, and certain scientific discoveries, set the stage for a highly reactionary swing away from the Classical themes and the highly polished style of the Academic model (Davies et. al. 868-9). Perhaps the most damaging blow to the Academies was a simple change in taste.

---

[1] The word 'finish,' in an artistic sense, refers to the level of polish of a work of art. A work with visible brush strokes is less finished than a slick surfaced painting showing less obvious evidence of the artist's hand. A painting by William-Adolphe Bouguereau is executed to a higher finish than a work by John Singer Sargent.

*Impressionism*

In mid-nineteenth century France the Realism Movement[2] took root, and aesthetic taste turned away from the classically themes that were valued so highly in the Academies. Realism, as a movement, was concerned with realistic subject matter: scenes of everyday life, and the hierarchy of genres was broken (Davies, et. al. 862). Normal people, instead of mythological figures, became the most popular subjects, and landscape and still life were no longer treated as lower forms of painting.

As the subjects turned grittier and more democratized, paint handling became looser and less highly polished. Brush strokes started to become more and more evident. The highly polished style and the idealized aesthetic of the Academy was out of place in a painting of a woman washing dishes, or of men cutting wheat. In fact, more earthy, loose, and visible paint handling enhanced these types of genre scenes by introducing a bit of chaos and texture to the painting's surface.

One of these loosely painting French Realists was Gustave Courbet, who is credited with opening the door, by way of his realist themes and looser paint handling, for the even more loosely painting Manet. Eduard Manet, with his broad style, realistic subject matter, and his liberty with the rules of perspective is credited in turn for catalyzing Impressionism (Davies, et. al. 870).

The Impressionist movement represents a major turning point in the history of art. The goal of these painters was to capture an individual visual impression of a scene instead of a highly rendered illusionistic interpretation. The shift in aesthetic, along with advances in optics,

[2] 'Realism' here does not necessarily connote the modern interpretation of the word realistic as it relates to art: that is, painted or drawn in a representational, naturalistic manner. Instead, it refers to realistic subject matter. Although Realist paintings do depict their subjects as they appear in nature, the naturalism seen in the Realism Movement exists to depict the realistic scenes, not as a prime goal in itself.

photography and a deeper understanding of the eye fundamentally changed the artistic equation. The style and purpose of Impressionist work was very different from what had come before, employing broken patches of relative perceptual color to communicate a highly individualized interpretation of a subject.

Although their work represented a distinct break from the Academic style, the vast majority of the exhibiting Impressionists had still acquired solid foundational skills through academic-style training at the hands of masters (Aristides, "Classical Drawing Atelier" 8). In other words, the Impressionists still learned how to draw, and their draftsmanship certainly helped them to make the quantum leap that they did, if for no other reason than having a deep understanding of what they were reacting against.

*The Institutionalization of Expression and Abstraction*

Over the next hundred years art, in general, became more and more abstract. A series of artistic movements can be delineated, each as a more abstract[3] reaction against the preceding movement. What artists put on their canvasses moved farther and farther away from nature, and art became increasingly about itself and individual expression.

Post-Impressionists like Paul Cézanne, Vincent Van Gogh, Georges Seurat and Paul Gauguin, through their reaction against the Impressionist way of painting, created "a new avant-garde that would lead art down a path that made it esoteric and thus incomprehensible for mass audiences" (Davies et. al. 911). The Post-Impressionists as a whole rejected a collective way of seeing, as was the case with Impressionism; instead, each artist developed his own personal aesthetic. (Davies et. al. 905). Impressionism had imparted considerable momentum to the

[3] Abstraction, as a movement and component of artistic style, is concerned not with the depiction of people and things, but with composing purely visual experiences using form, color, value, line, texture, etc. Most art can be said to have some level of abstraction, that is, some reduction of the subject into shapes and colors as an element of design.

valuation of the individuality of an artist, and Post-Impressionists ran with the idea. The celebrity of the artist and their individual style now comprised an even larger share of what gave value to a work of art.

Novelty was gaining traction, as each new group of artists tried to be the next big thing, and the revolutions and movements sprung up and faded away so rapidly that they were overlapping. A sure way to remain obscure was to continue the 'old' forms; for example, no-one would care about an artist taking up Pointillism ten years after it was passé. As the expression of the individual artist became proportionally more important, and the meaning of the piece retained its importance, something that had to diminish in order to make room. Thus the craft of a piece, its drawing, construction, materials and techniques, all suffered in favor of novelty and individuality.

The twentieth century saw the explosion of Modernism. Fauvism, Cubism, Futurism, and Dada. These movements, and others, all shifted the value of art from beauty, craft and meaning towards novelty, expression and design. These individual movements were short-lived, each remaining relevant for under twenty years (Davies, et. al.). They expired so quickly because novelty was a large part of what made them important; the movement would self-destruct when something even more new came along. Although these fleeting movements did not last, their values and overall structure, that of rejection, novelty and individuality, persisted and have become ingrained in the art world. Eventually, individual movements became less relevant in such a violent atmosphere. The clear distinctions between styles were shed in this period of continual upheaval, and everything smeared out into the rolling boil that is Post-Modernism.

*The Bauhaus and Art Education*

The former model of art education, the Academy, no longer fit with the rapidly evolving art world; the way it taught art, through studying the old forms and ideals, and learning a highly

developed set of drawing and painting skills, was anathema to the modernists. A vacuum had been growing; if the Academy was outdated, who would teach students how to be modernists?

The Bauhaus, a German school of architecture lead by Walter Gropius, sought to redesign art education. Johannes Itten, who was explicitly hostile toward the Academies, taught the foundational program at the Bauhaus. He said that “its chief function is to liberate the individual by breaking down conventional patterns of thought in order to make way for personal experiences and discoveries which will enable him to see his own potentialities and limitations” (qtd. in Raleigh 284). Students here were meant to un-learn what they knew about art and return to a childlike state, from which they could discover artistic solutions in an individual, self-expressive manner. Itten eschewed formal training in draftsmanship; he had his students eat lemons so they could better draw their 'lemon-ness.' The training offered at the Bauhaus was a complete break from the Academy, and now it had become institutionalized.

Although the aesthetic of the Bauhaus fizzled, its ideas have been much more permanent. The teaching method could not have been designed to compete more effectively with the Academic model; its values aligned with modernism and novelty and expression were paramount (at least in the foundational courses).

The system split instruction into the elements of art: line, form, shape, color, etc., and taught them independently from each other. Students were not expected to produce finished work, they were expected to experiment with materials and perceptual forms in order to develop a personal artistic vocabulary. The Bauhaus was also interested in the artist's ideas about the work. Since individual expression was valued, meaning there was more than one 'correct' answer, the student was expected to be able to defend the particular approach he had taken (Phelan 7-8). The value of a work of art was now not only tied to the personality of the artist,

but also to his explanation of the work. This can be pointed to as a major leap toward conceptual art, and the verbalization[4] of the visual arts as a whole.

It must also be stressed that this type of education is easier than the academic model; modern art is easier to learn, easier to make, and easier to teach poorly and get away with it.[5] It was current and fit modernist theory perfectly. It was also pre-packaged into semester-like units. This combination of proved irresistible to American universities.

Itten's eventual successor, Laszlo Mohly-Nagy founded the Institute of Design in Chicago in 1937, where he imported the Bauhaus model of teaching. Around this time, the father of Bauhaus, Walter Gropius, began teaching at the Harvard Graduate School of Design in Cambridge, Massachusetts. Ever since the Impressionists had made a clean break from the Academy the need had been growing for an educational model that was equipped to deal with the specific questions and values of Modern Art. The Bauhaus model of teaching the elements of art through experimentation toward the goal of self-expression (accompanied by an articulable defense) exploded through the university system and persists, intact, to this day (Phelan 13).

*Post-Modernism and Conceptual Art*

Post-Modernism is an umbrella term describing the Abstract Expressionist, Pop-Art, and Formalist movements, among others, from World War II to the present. During this time, the center of the art world shifted to New York City (Davies et. al. 1037). These forms were continuations on the themes of novelty, reductionist thought, abstraction, and self-expression.

---

[4]Verbalization describes how art, devoid of the communicative power of representation, is increasingly dependent upon verbal or written explanations of its meaning and purpose. The words *are* the meaning of the work.

[5] This sentence does not mean that modern art is easy, it means that the dominant model for teaching it is almost engineered to allow mediocrity. It can be just as challenging and rewarding as more visually-based work. Since the criteria for judging it are so subjective it, this type of training is easier in the sense that one can glide through a program without ever putting forth the substantial effort required to produce good idea-centric work.

Through these movements, art became so abstract and far-removed from reality that, in some cases, no physical object was created. This signaled the birth of purely conceptual art. Conceptual Art is a movement that can trace its beginnings back to Marcel Duchamp's urinal-turned-artwork “Fountain” (1971), which emphasizes not the narrative and aesthetic qualities of Realism, not the visual experience of Abstract Expressionism, but the identity and function of art itself. Lawrence Weiner, in his 1968 “Statement of Intent”, described conceptual art in the following way:

1. The artist may construct the piece.

2. The piece may be fabricated.

3. The piece need not be built.

Each being equal and consistent with the intent of the artist, the decision as to condition rests with the receiver upon the occasion of receivership.

This represents another paradigm shift in the art world. In the Academy, it was obvious if a student's work was successful or not; was it well made, beautiful (as judged by their aesthetic) and did it communicate the intended message? In the post-conceptual, Bauhaus-structured modern art-educational model, it is difficult, if not impossible, to objectively evaluate a work of art because its value is so heavily weighted upon the individuality of the artist and the idea behind the work. The utility of an objective argument breaks down when the piece is this subjective. Highly conceptual art can be so inaccessible that it completely fails to communicate on its own; the viewer has to literally be told what to think and feel when they are experiencing the work. What, then, constitutes bad modern art?

Although heavily conceptual art can be the product of immense skill and intellect, and result in beautiful, meaningful ideas and forms, it is also an institutionalized structure that makes it very easy to make bad art, and trains and encourages students to make excuses for it.

*Contemporary Realist Training*

Classical Realism is somewhat of an umbrella term covering a new generation of realist painters who naturalistically portray their subjects. Today there are schools and academies that offer training in realist painting and drawing, like the Water Street Atelier in New York City, Studio Incamminati in Philadelphia, the Angel Academy of Art in Florence, the Academy of Realist Art in Toronto, along with many smaller ateliers[6].

The training at an atelier varies from school to school, but generalizations can be made. Students are taught how to draw accurately, through hands-on practice every day. Life drawing, still life, master copies, and cast drawing are all taught with the same goal in mind; the training at ateliers is all meant to increase accuracy, sensitivity and understanding in order to be able to beautifully represent the most difficult subject in the world: the human form.

Atelier training usually lasts as long as a course of study at a B.F.A. Program. Students the come out of these schools have the skill-set to produce beautiful, finely rendered work and a vast visual vocabulary with which to express themselves.

*Obstacles between Students and the Best Practices in Realist Training*

Training at these specialized institutions is inaccessible or otherwise infeasible for most art students today. Access to training is limited by a number of factors. These schools are often located in areas with a higher cost of living (Manhattan) or in other countries (Italy, Canada, and France).

Another disincentive for attending these schools is that they are not accredited or recognized by any government, and training received there is (with very rare exceptions) not recognized for credit within the traditional university structure.

---

[6] 'Atelier' is a French word for workshop, and is generally used in English to mean an artist's workshop/teaching studio.

This training does not translate into academia for a few reasons. First, the schools are unaccredited; to be accredited they would have to attenuate their artistic training with liberal arts studies, and subject themselves to oversight by some governing body whose goals do not align with the goals of the typical atelier. Second, the training is not usually broken up into semesters, credit hours or discrete classes that could be digested by a university. Third, evaluations conducted at ateliers are usually ongoing and face to face, and the student does not advance unless they have mastered the desired skill; there are no grades. Fourth, it is atypical that the artist/teachers at these schools have earned the necessary credential to teach a college-level course.

Although ateliers are unaccredited, The Art Renewal Center (ARC), an institution dedicated to the advancement of realist technique, does publish lists of ARC Approved training programs. Their recommendation serves only to guide prospective students, and does not constitute any sort of recognized accreditation.

Finances are another prime concern. Tuition at these schools is generally significantly lower than full-time Bachelor of Fine Arts or Master of Fine Arts programs at private universities (hereafter referred to as B.F.A. and M.F.A. programs, respectively), ranging from around $8000/yr at the Water Street Atelier in New York City (The Grand Central Academy of Art - Water Street Atelier) to $14,500/yr at the relatively expensive Florence Academy of Art (Florence Academy of Art: Application Form). Full-time training programs take three to four years to complete, and students are not qualified for any financial aid like student loans or Pell grants to offset or defer the costs of tuition, materials or living expenses, facing prospective students with a considerable financial burden should they choose atelier-style training. Financial aid and scholarships are offered in a few schools but it is not typical. Thus, students must have the financial resources in order to pay for everything out-of-pocket or go somewhere else.

Tuition costs for B.F.A. programs at art universities picks up where the Atelier training leaves off; Tyler School of Art, part of Temple University, charges 14,102/yr for in-state students (2007-08 Tuition Information for Tyler School of Art), while the Rhode Island School of Design charges $36,364/yr (RISD : Rhode Island School of Design : FACTS + FIGURES). Although programs at state and private university programs can be four to five times more expensive per annum than atelier training they are, paradoxically, more affordable for most students. They offer tuition assistance, qualification for federally subsidized student loans, and in some cases student housing. Although these students will generally pay significantly more overall for their education than academy or atelier trained students, their costs will be delayed until after graduation graduation, and then stretched out over time while they pay back their low-interest loans.

Teaching opportunities for artists who complete atelier training are often limited to the same institution they studied at, another atelier, or opening their own school. This is because the university system in the US generally considers the lack of a terminal degree (an M.F.A.) as a disqualifier for any teaching position at the university level. This separation has deepened the rift between university students in B.F.A. programs and classical realist training.

Generally, training in realist technique and draftsmanship is both limited in scope and superficial at art universities. Curricula allow students, from the very beginning, considerable freedom and artistic choice instead of first equipping them with the visual and technical tools they could use to fully pursue their artistic passions. Individuality and expressiveness are given considerable weight in curricula, and the ability to accurately draw is, to a large degree, disregarded (see Appendix: Methodology for Establishing the Bias of University Art Programs).

Universities need to equip their students with a holistic skill set. It is incumbent upon art educators, those who wish to become art educators, and the institutional system as a whole, to

identify and implement ways that they can better serve their students. The biggest weakness is draftsmanship, and placing more emphasis on the rudiments of drawing represents the greatest potential improvement for most programs.

# Part II: The Drawing Course

**Course Background**

Today's art education focuses heavily on the conceptual: the meaning behind the work and what it communicates to the viewer. Materials are also addressed, giving students an opportunity to explore different media and styles in order to narrow down the type of art they would most like to make. The problem is that these things, along with personal style, rhetoric and concept, are given disproportionate emphasis over basic drawing skill. Sometimes the emphasis on expression at the expense of draftsmanship can undermine itself; a student may be not be able to fully communicate the meaning of his piece because his weak drawing skills get in the way.

Drawing, in its simplest form, is mark-making, and drawing is only one part of making a two-dimensional work of art. Art can teach, communicate meaning, feeling, emotion, empathy, etc. It can put the viewer inside the head of the artist, and it can give the viewer an opportunity to see the beauty in nature as it is seen and felt by someone who has spent many years studying it. The mechanics of representational drawing comprise only a part of what makes this exchange possible, but they can be a vital one.

This college course was developed to address the problem of weak training in the most potent and efficient ways that could be gathered by the author. The concepts and techniques herein represent the most powerful tools to improve drawing that could realistically be taught within a typical 14-week semester.

This is not meant as the ideal first college level class, or as a comprehensive drawing course, but as a supplement to the current foundation structure in order to re-balance the training of university art students. It is meant to be taught concurrently with training in communication, meaning and concept. It is a collection of the low hanging fruit; these are things that are easily taught and grasped, and those that will make the most impact.

Every topic covered could conceivably warrant its own semester-long class, and it is made clear to the student that what is presented here is merely a gross representation of these techniques. The student is encouraged to study the topics of most interest and use to him on his own time and in conjunction with his continuing studies.

It is acknowledged that almost every university will address at least some of the techniques and theories presented herein at one time or another during their standard course of study, but it is likely that the techniques, if covered in any depth at all, are taught as part of some other exercise with some goal other than draftsmanship. These skills are critical, and must be taught effectively at the very beginning of a course of study, and they must be practiced.

## Syllabus

### *Structure*

This syllabus is structured around a fourteen week long semester, a typical length for universities with a two-semester academic calendar. It assumes two class periods per week, each approximately three hours in length.

Each unit is structured in a similar manner. First there is an introduction to the topic, and then a brief lecture that covering the major points. After that there is an exercise, or series of exercises, that are meant to put the new material into practice while incorporating material from previous units.

The exercises all share a similar structure. The purpose of the exercise is clearly stated, followed by any special materials that might be needed in addition to the standard list. Step-by-step explanations and photographs with descriptive captions walk the student through the exercise.

The lectures have been kept brief, and so have the exercises. Since the exercises take so little time, none more than twenty minutes or so, the student should be able to complete each one five times or more during a class session. This repetition is important. Repetition of these focused exercises will ingrain thought patterns in students that will be very helpful in terms of basic drawing skill. Each exercise is concluded with a short section on how the student can practice the techniques on his own with higher levels of difficulty toward deeper understanding.

Each class is structured in the same way. First, there is a lecture and demonstration illustrating the theories and techniques to be covered for that unit. Then, there is a demonstration of the exercise to be completed; the instructor will complete the exercise from start to finish so the students know what they should be looking for. The instructor will also make mistakes on purpose, so the students not only know what to do, but what to avoid and how. After the lectures

and demonstrations are complete the students will perform the exercises, over and over, until the class period is over. The instructor will give students individual critiques throughout the class period.

There will be three reviews, where the concepts covered in the prior weeks will be briefly reviewed in a discussion format. Students are encouraged to share their observations about the material with the class. These will be followed by a critique, when the students will hang up the least successful and most successful drawings from each practical application exercise. This contrast will demonstrate improvement and illustrate how one can get better through practice, and it will also show what areas still need improvement.

*Learning Outcomes*

Students, upon completion of this course, will be conversant in the technical language of visual art. They will have a basic understanding of line, design, measurement techniques, depth perception, and how light falls on form. They will have a solid understanding of important techniques and theories, and they will know how to maintain and improve these skills if they choose to do so. Another main objective of the course is to inculcate a work ethic and a framework facilitating self-criticism. The ability to evaluate one's own work and troubleshoot is a highly valuable skill; after this semester, when students are faced with an unsatisfactory work in progress, they will know what to look for and how to fix it.

Another goal of this course is to make students realize that representational drawing is a skill that can be taught, learned, practiced and improved upon. Some students may want to make accurate drawings but can be discouraged because they think it is un-learnable, or too hard. Students must realize that success in drawing, like any other skilled field, relies on patience, hard work, and practice. Talent is a fiction; what we think of as talent is merely hard work and passion for learning. Just as anyone who applies themselves to understanding the basic concepts

and techniques in this course will gain a basic ability to draw accurately, anyone who puts in the time and effort can become a master draftsman.

*Required Materials*

The required materials for this course are inexpensive, easy to procure, and easy to use. The student should be able to find everything in any decently-equipped art supply store. Aside from the required still life objects, this entire course can be completed with these simple, inexpensive materials. Students should have all of these materials at hand for each exercise. Any special materials requirements, or any requirements for a certain type of still life object, be found a the beginning of each exercise.

Materials List

2 Newsprint pads, 18x24”

1 Drawing board (you can make your own or buy one, but it must be larger than 18x24” and you should be able to easily secure your drawing pads to it with clips)

Clips to secure your paper pads to your drawing boards (store-bought boards may have clips built-in)

1 Box General's brand soft charcoal pencils

1 Box General's brand hard charcoal pencils

Pencil Sharpener

2 Kneaded erasers.

2 Knitting needles, bicycle spokes, kebab skewers, or comparable rigid, slender rods around a foot long for measuring.

*Weekly Synopsis*

Week 1

Symbols and Representational Drawings

Practical Application: Symbol Drawings Compared to Observed Drawings

Line

Practical Application: Playing with Line

Practical Application: Drawing Curves

Week 2

Gesture and Action

Practical Application: Gesture and Action

Practical Application: Drawing Your Own Hand

Week 3

Measuring

Practical Application: Comparative Measurement

Week 4

Measuring, continued

Practical Application: Optical Reduction

Week 5

Measuring, continued

Practical Application: Relating Multiple Objects in Proportion

Week 6

Review I

Group Critique I

Week 7

Design and Composition

Practical Application: Compositional Exercises

Common Drawing Errors

Practical Application: Avoiding Tipping, Frontalizing and Foreshortening Errors

Week 8

Common Drawing Errors, continued

Practical Application: Drawing Ellipses

Practical Application: Drawing Cylinders

Week 9

Value

Practical Application: Value Structure Drawing of Single Sphere

Week 10

Review II

Group Critique II

Week 11

Value, continued

Practical Application: Value Structure Drawing of Two Spheres

Week 12

Modeling Factors and the Behavior of Light

Practical Application: Form Spheres

Week 13

Linear Perspective and Volume

Week 14

Monocular Depth Cues

Practical Application: Still Life Using Monocular Depth Cues

Week 15

Review III

Group Critique III

## Symbols and Representational Drawings

### *Symbols and Perception*

We experience the world through our senses. When we sense something, our sensory neurons are sending information to our brains. Our brains must decode this information and turn it into usable knowledge. This is perception. Perception is knowing something about something you are sensing: instead of sensing random bits of color, our brain sorts out the raw data from our eyes and we perceive three dimensions full of discrete objects.

Our senses are discrete; we cannot smell colors, or taste sounds (except for in instances of rare neurological disorders). Our perception of the visual world, on the other hand, is characterized by overlapping senses.

To make an accurate drawing we must disregard most of what our other senses are telling us and focus on our sense of vision. This is harder than it seems, because we do not perceive the world in this manner. Our brains are not wired that way, and we all have been practicing integrating our senses for our entire lives. It can be very difficult to separate one from the rest.

This is because we think very experientially. Our eyes are constantly translating streams of photons of different wavelengths, but we do not experience the world as a field of color patches. We see a mug and anticipate its weight, the sound it will make when a spoon hits its edge, the smell of the coffee within, the temperature of the ceramic, the heft of the handle, and the precise muscular choreography necessary to bring that mug to our lips to take a sip. Our vision is integrated with our other senses, and these other senses often intrude upon our vision even when we do not want them to.

For example, if you are drawing a pair of eyes in a portrait, you will probably do a better job if you are able to disregard the fact that they are eyes and draw the shapes you see instead. If

you are thinking about eyes when you are drawing, you are likely to draw a symbol of an eye. It is very easy when drawing to allow symbolic thinking to intrude upon our drawings.

Our minds tend to generalize and categorize information. When we see a coffee mug, we think of it in terms of how it is similar to other mugs, not in terms of what makes it unique or how it appears at that moment under specific lighting conditions. When we see a table we know that we can put things on its surface; we do not appreciate that it has a certain height, width, depth, value, etc. When we see someone's face we split it up into eyes, ears, a nose and a mouth even though these features are integrated into a face and wrapped over a skull, and the entire construction of the head is what gives a likeness.

Since this type of experiential perception, this way of recognizing and categorizing things is so strong it is very likely to intrude upon our drawings. Mugs will be rotated to emphasize the handle and the sipping rim, tables will be tipped forward to show their surface, and faces will be broken down into individual symbolic features. This is because we are drawing what we are perceiving, rather than what we are seeing.

If we can ignore and avoid generalizations and experiential warping of subjects when drawing, we can create more accurate drawings. If we draw the object accurately, it will be our viewer's perception that tricks them; our accurate drawings will trigger the same experiential perception in them that we are trying to avoid. This is one of the key methods of creating illusion in a drawing; avoid perceptual pitfalls, but use the viewer's perception to your advantage.

*Practical Application: Symbol Drawings Compared to Observed Drawings*

Purpose: To create awareness of visual symbols.

Materials: Objects like an apple, banana, hammer, mug, etc. (see below).

Think of some objects that you interact with on a daily basis. Draw them one by one, instinctively. Draw your idea about the object. Some everyday objects that you might want to draw are a house, a spoon, a car, a hand, a face, etc. (fig. 1).

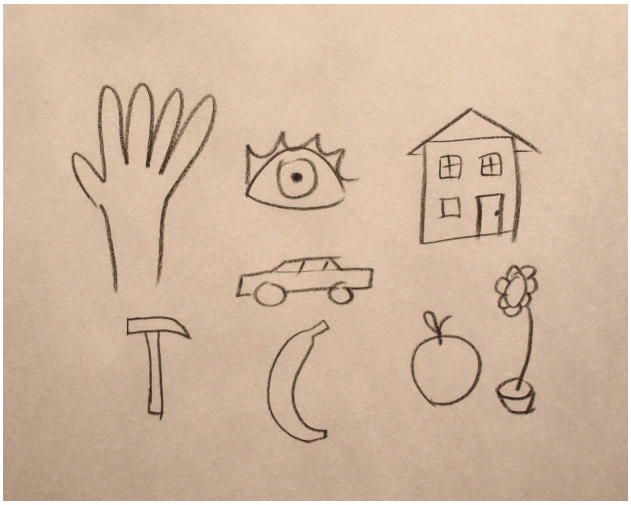

*Figure 1: Some drawings of everyday objects done from memory. Notice how symbolic they are.*

Next, look at your subject, and then put it away. Without actually looking at it, draw it from your memory and imagination. If it is a mug, draw your idea of what a mug looks like (fig. 2).

Next, set the object up and draw it again, but this time try to draw what you are seeing fairly accurately. Look at the subject in terms of a series of shapes, lines and patterns. Actively ignore the fact that it is an actual object (fig. 3).

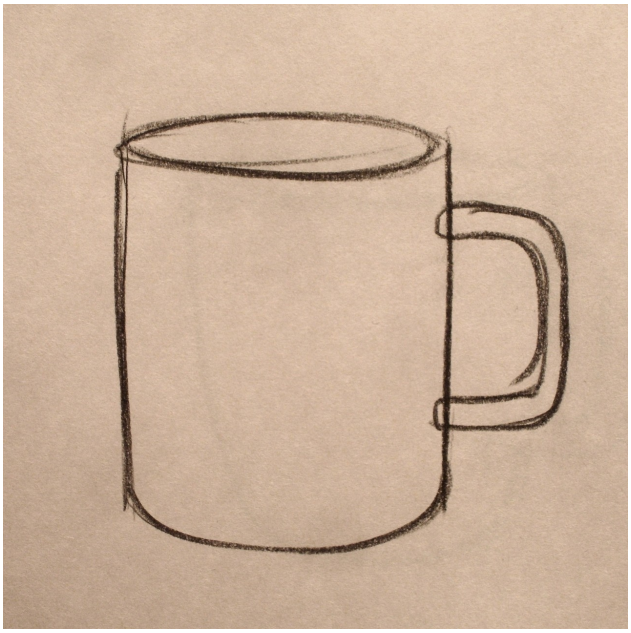

*Figure 2: A mug drawn from memory. Note the simplistic outline, generalized handle, and profile view.*

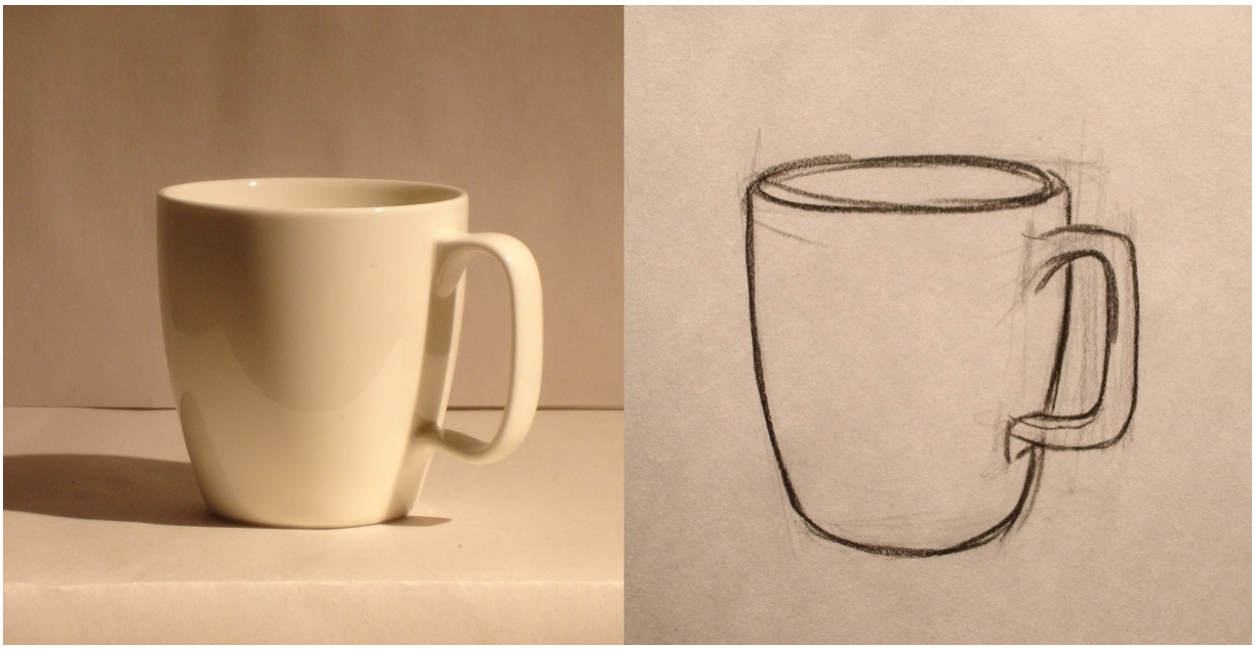

*Figure 3: Notice how this second drawing has more presence; it looks more real. While the drawing is not perfect, the handle is more articulated, and the drawing as a whole is more specific and voluminous than the memory drawing.*

Repeat this exercise with as many hand-held objects as you can find, as often these have the strongest symbolic meaning to us because of how we interact with them using multiple senses. Notice that when you first draw the object from memory it is generalized and symbolic. Compare the memory drawing to the observed one, and notice the differenced. Always make it a habit to recognize your mistakes, and develop ways of anticipating and avoiding them.

Further Study

Symbols are exceptionally strong when it comes to the human body. If you have the opportunity to draw from the model, getting past your ideas of what an eye or a hand should look like is a major hurdle on the way to an accurate drawing. Awareness of the strength of symbolic images will better equip you to negotiate these problems as they arise.

**Line**

*Different Types of Line*

"A line is a path between two points" (deMartin "The Properties of Line"). Lines can be curved or straight, thick or thin, light or heavy, long or short, abrupt or meandering, etc. lines can change their character on the way from one point to another. Curvy lines have special properties, like amplitude and inflection, but every lone segment has a beginning and an end, and this is the most important information about a line segment (fig. 4).

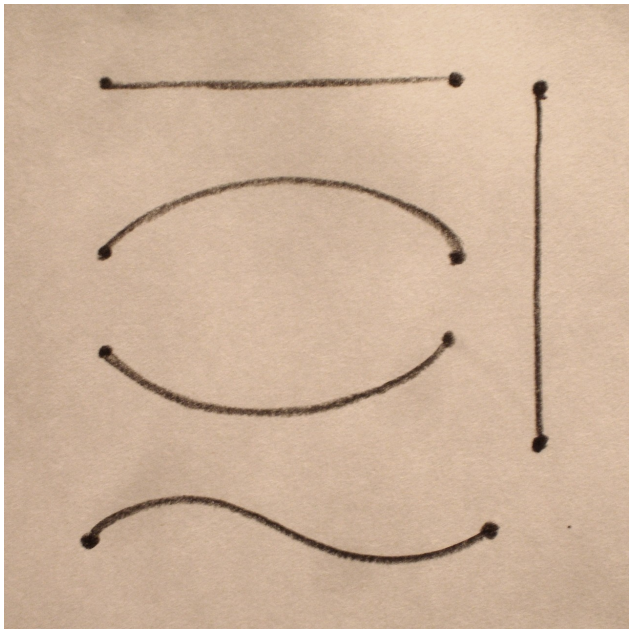

*Figure 4: Two straight lines, an upward and downward 'C' curve, and an 'S' curve, which is really two 'C' curves joined at a point of inflection.*

Straight lines describe directionality, thrust, perspective, etc. They are very powerful elements in directing the eye of the viewer. Alone they can communicate a stable, restful feeling (horizontal), a strong feeling (straight up and down), and a dynamic impression of motion or potential movement (diagonals). People who read left to right also tend to scan a picture in the same direction, and diagonals can be read this way A diagonal going up and to the right might be a line about to fall down or move forward, or a represent a slowing moment in a composition. A diagonal sloping downward and to the right can feel like it is accelerating.

Lines can be fat, skinny, light, dark, curvy, straight, consistent, or wavering. They can be alone or in a group, ordered or chaotic (fig. 5).

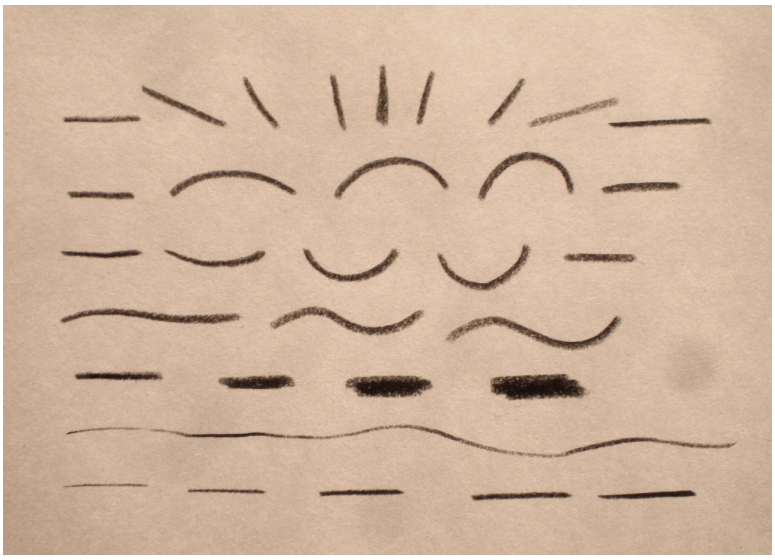

*Figure 5: Some variations that are possible with line.*

Before you make a mark, consider the line weight, character, and direction. If your lines start somewhere, end somewhere, and travel the distance in an informed, designed manner, your lines will have much more authority, and so, by extension, will your drawing.

Where is the most active area of your subject? How should you express that in line? Where is your focal point? How can you use the direction and quality of your lines to draw the viewer's eye toward that focal point? What kind of lines would be helpful to describe a shiny object? What about a tennis ball? Each line has a certain character, and it starts somewhere and ends up somewhere; consider all of these things while making your marks.

Curves

Curves have a few special properties that set them apart from straight lines. As line segments they still have a beginning and an end, but in-between those points they deviate from the straight path. The measure of this deviation is called the amplitude. A very subtle curve will have a small amplitude, while a very strong curve will have a larger one (fig. 6).

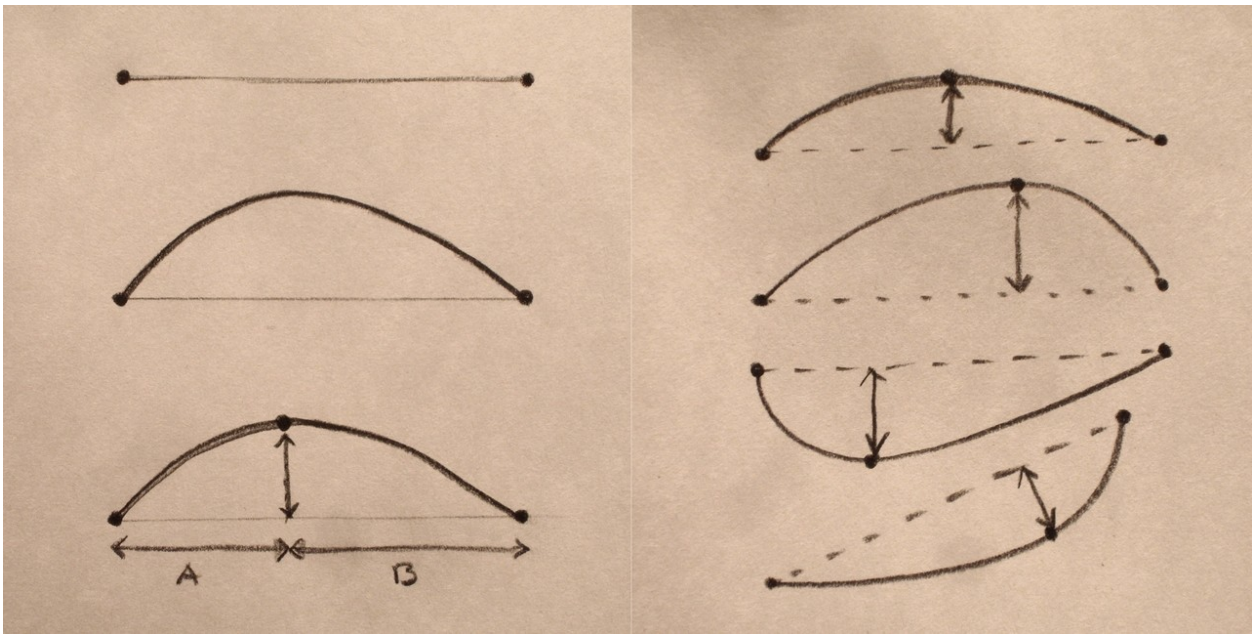


*Figure 6: The drawing on the left shows how to find the point of amplitude of a curve. The drawing on the right shows some curves with offset points of amplitude.*

If you imagined a straight line between the start and end points of a curve, the point of amplitude is the point on the curve that is farthest away from the line. In some cases the point of amplitude is centered between the start and end points, and in others it is offset. Organic subjects tend to have points of amplitude that are offset from center. Correctly placing the end points of a curve, and the relative position of the point of amplitude are critical for capturing the character of that curve (fig. 7).

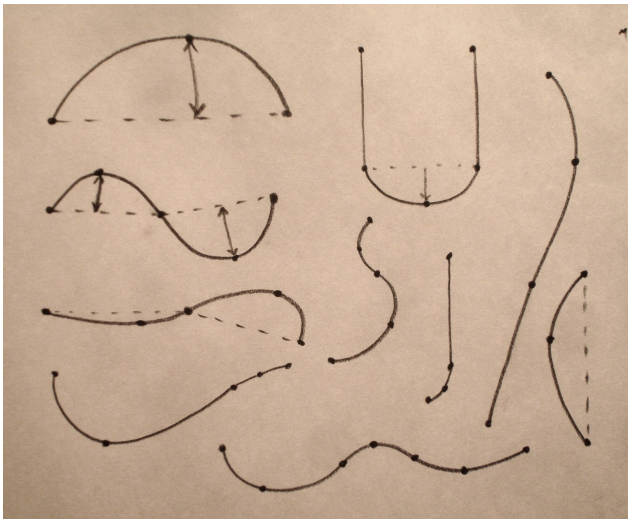

*Figure 7: Different types of curves. If the end point, point of inflection, or the point of amplitude was changed for any of these curves it would look quite different.*

*Practical Application: Playing with Lines*

Purpose: To begin to develop a vocabulary of line, and to recognize that lines can communicate information about the subject.

Materials: Objects with different textures (soft, hard, ceramic, wooden, fuzzy, etc.).

Arrange a series of objects, representing a variety of weights, materials and textures. Draw each one with a wide variety of line (fig. 8). Carefully select your line quality before you make a mark: should you use a bold, heavy, straight line for the edge of a fuzzy toy or a lighter, broader, curving line? What about a shiny bowl, or the pebbled skin of an orange? Does a lighter area call for a softer line? Does the spot where an object touches the table top call for a darker line?

*Figure 8: This five-minute drawing attempts to capture the different textures and relationships of the objects through the use of diverse and considered line. For example, the glass of the bottle has been simply drawn, and the handle of the hammer looks softer than the metal shank.*

After you draw the objects, step back and assess your success. Does each line communicate what you intended to communicate? Do the harder, smoother objects look that way when compared to softer ones? Repeat this exercise with the same setup, and address the weaknesses you found while evaluating your first drawing. After that, change the still life objects and do the exercise again, trying to capture new information about the subjects in line.

Further Study

Study old master drawings. Ignore the picture as a whole at first, and pick out your favorite lines in the entire composition. What is so successful about them? What do you like most about them? What do they communicate?

*Practical Application: Drawing Curves*

Purpose: To learn how to accurately capture the character of a curved line segment by correctly placing its end points and point of amplitude.

Materials: Still life objects with complicated curves.

Set your subject on the table (fig. 9). Pick an emphatic curve on the object (an obvious one that readily presents itself to you), and draw its starting and ending point on your paper. You can either draw a line between them on your paper or imagine the line, but make sure that the angle of this line matches that of the object. If you are drawing an 'S' curve, find its point of inflection and mark that as well. These curves might be continuous, so sometimes you will have to choose where to place the end points. Also keep in mind that the point of inflection may not lie on the line between your two end points (fig. 10).

*Figure 9: This small pitcher has quite a few 'S' curves.*

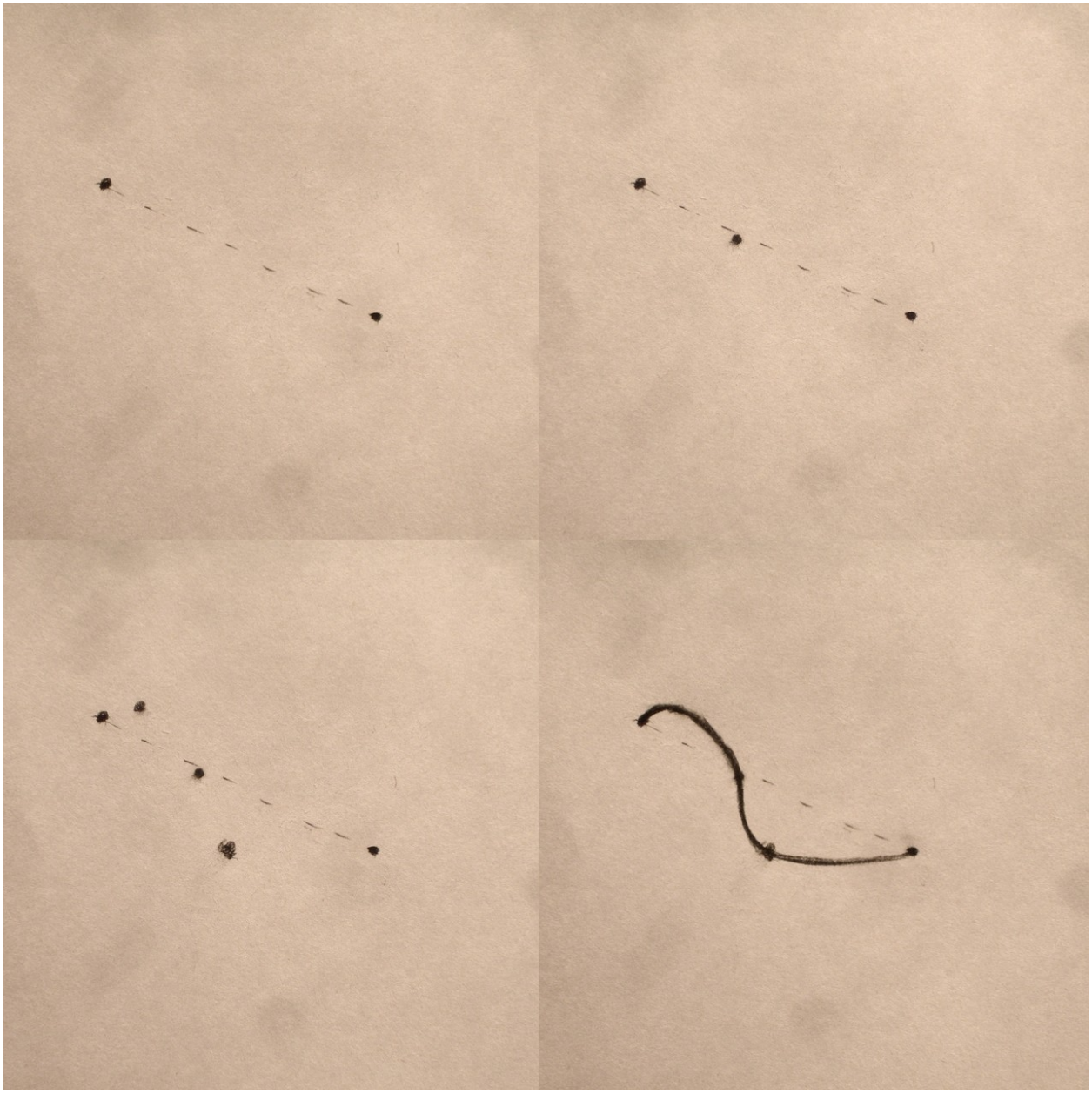

*Figure 10: This illustration shows the following: finding the beginning and end of an 'S' curve, finding the point of inflection, finding the points of amplitude, and filling in the curve.*

Next, find the points of amplitude for each curve or curve segment. Make sure you find how far it is from either end point and its amplitude. After that, fill in the rest of the curve. Continue doing this for entire sections of the object (fig. 11).

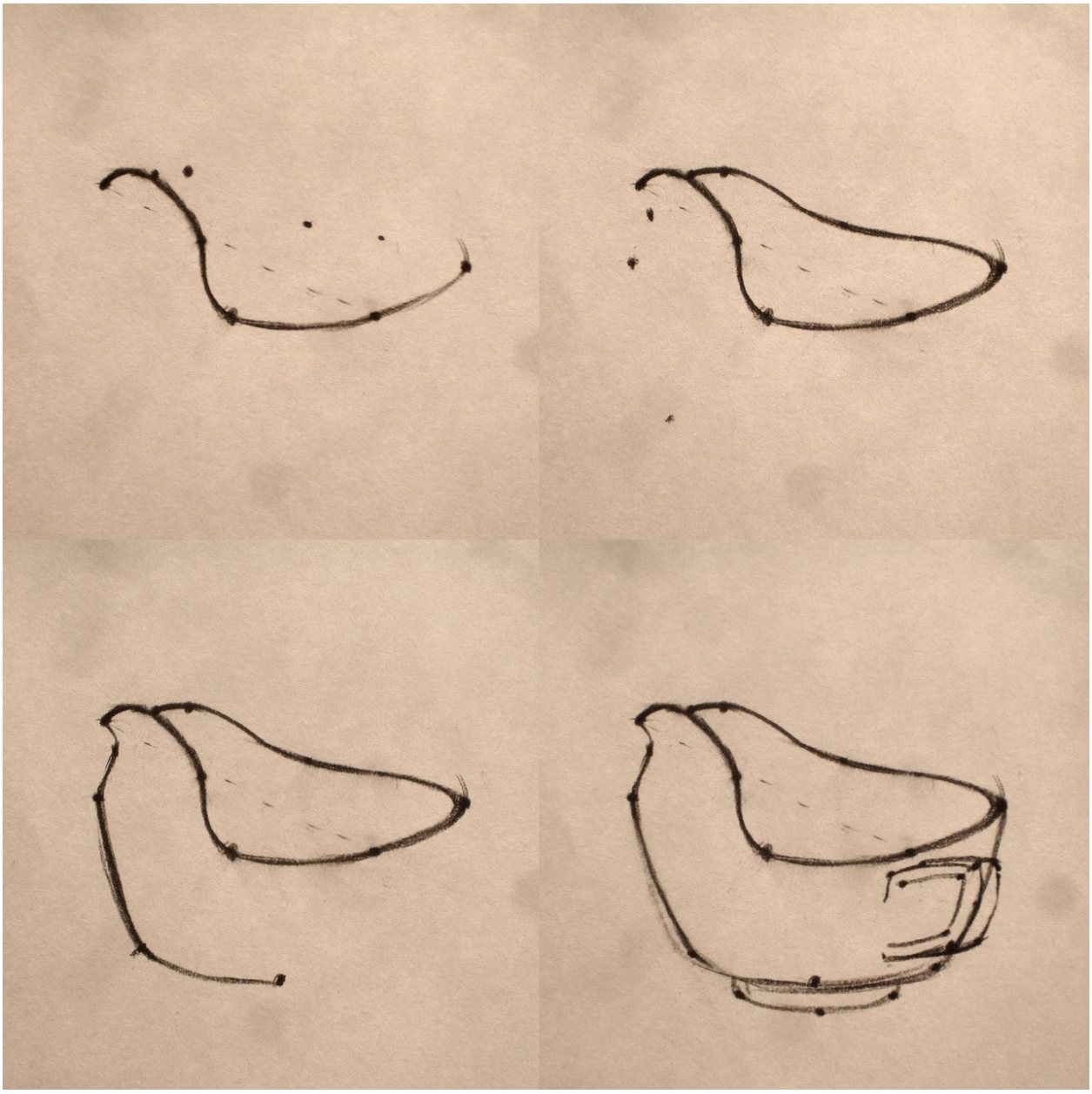

*Figure 11: Notice how the critical points of each curve are mapped out before it is drawn.*

The point of this exercise is not to draw a completed object that looks exactly like the subject, but to gain familiarity with curves, and to train the yourself how to capture the character of those curves with ease. Whenever you need to draw a curve, first determine its end points, its amplitude and its relationship to other curves. This will help you avoid generalizing your curves and will keep them more meaningful.

Further Study

Study curves throughout the day. For each curve segment, recognize its end points, its point of amplitude and its point of inflection if present. Study the human body, either in life or in pictures, and copy the complex curves you see. A great source for complex curves to copy from is an anatomy book. Muscles all tend to have very graceful and asymmetrical organic curves, and accurately copying the curves of muscles is a very good study aid.

**Gesture and Action**

The term gesture can be loosely defined as the simplified expression of what someone or something is doing in space. It usually refers to imagined or simplified linear abstractions instead of contour (the finished 'outline' of a shape). A gestural drawing is more concerned with accurately capturing the character of an object and its dynamic in space instead of accurately capturing its appearance or contour. A gesture can be linear or mass oriented, or a combination.

Making a gesture drawing can be thought of as drawing the verbs of the subject, while more optically accurate drawings will focus more on the nouns. In other words, a gesture drawing is drawing what the subject is doing, not what it is (deMartin “The Properties of Line”). Just because the point of a gesture is to capture the dynamic of the subject, it does not mean that optical accuracy is necessarily ignored. A gesture can be accurate to what the subject is doing and still be proportionally accurate; in fact, this might be the most helpful kind of gesture drawing.

The gesture can be found by searching for the most emphatic linear information in the subject. This might be a main bend in a figure, or the stem of a flower, or a line of action, then expanding on that information. This way, your drawing captures the most important information immediately. Look at the subject, and ask yourself what is it doing, and then draw that. Once you look for and find this main gesture you will be able to check the rest of your drawing against it. It is no fun to spend a lot of time and effort on a drawing only to discover that the gesture is off and your carefully rendered drawing does not communicate the most fundamental movements of the subject in space.

*Line of action*

A line of action is a gestural line that can be imagined as passing through a form along its length. These lines can be simple or very simple. For example, the line of action of an arm can

be imagined as starting at the shoulder, passing through the elbow, and all the way out the middle finger, while the line of action of floor lamp might just be a straight line through its entire height.

There is overlap between a line of action and a gesture, and in some cases it might be a distinction without meaning. The important thing to remember, and practice, is to look for the most important action, movement and dynamic within the subject, simplify this information, and accurately represent it in your drawing.

The gesture and action lines help you place your drawing on the page and determine its scale and major proportions rather quickly without a lot of measuring. It is much easier to move gestural information than it is to move developed shapes and forms, so use the gesture to place your subject on your page and you will avoid having to move things around and re-scale your drawing in later stages. Every subject can be thought of as having a gesture, from a figure to a tree to a cloud, and you can relate these gestures to each other to make sure they relate in scale.

A drawing can be stopped at the gestural stage, and as long as the gesture was accurately expressed, and there was a little forethought in the composition, it will be a satisfying drawing. A gesture can be taken further, however. Some of the most polished drawings ever created started out as loose gestural scribbles searching for the main actions of the subject. It is good practice to do gesture drawings as if you were going to take the drawing to a finish; make it accurate to the main movements of the subject through space, but also consider the placement on the page and proportional accuracy.

*Practical Application: Gesture and Action*

Purpose: To become aware of action lines and gesture.

Materials: Subjects with curves. Action figures, artists' model figurines, or anything else with a complex, organic shape will do.

Set up a few complex objects. Simpler objects might have a line of action that is just a short, vertical line, in which case the line of action really is not that helpful. After you have an object set up, find the line of action, and then draw it. You should be looking for the most emphatic line or lines in your setup, and then transcribing them as accurately as you can. Be aware of where the beginning and ending points are in relation to each other and when you are drawing your line; consciously identify points of amplitude (the farthest-out point on a curve) and points of inflection (where a curve changes direction). The beginning, ending, and points of inflection are very important for getting the line of action correct. Correct is a relative term, however, and two different people might respond to different movements through a subject and use a completely different line of action.

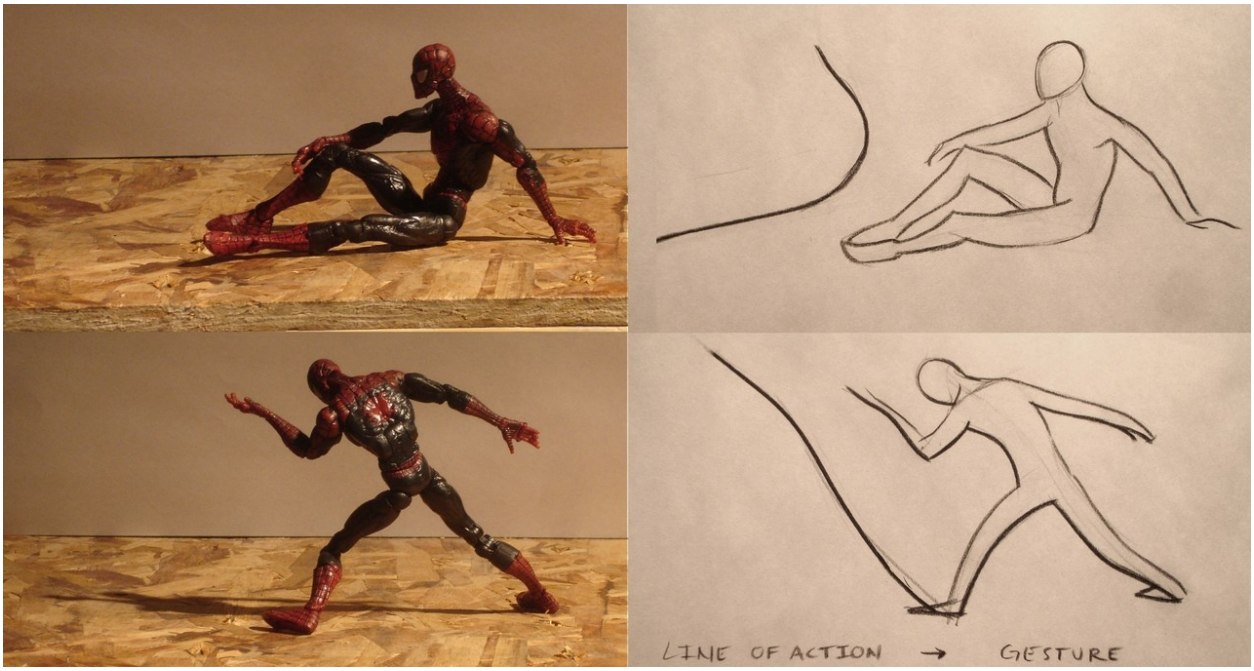


*Figure 12: Note how the line of action is an abstract idea about the main movement of the subject. The gesture is more of a volumetric idea about that movement, and includes all of the most important information.*

After you have drawn the lines of action running through a few objects it is time to build a gesture on top of that. Set up a new object. Find the line of action, and draw it. Right next to

that, draw the line of action again. This time take it further by adding more and more information (fig. 12).

There are no rules, only a final goal; try and communicate to the viewer the most important things about the subject. If it is a teapot, where are the spout and handle? If it is a figure, what is the main action, where are the ribcage, pelvis and head, how do they relate to each other in space, and what are all of the limbs doing?

You should be able to communicate all of the most important truths of a subject through a good gestural drawing. Remember, you are trying to record what the subject is doing in space, not necessarily what the subject is.

Further Study

Look through a magazine or the newspaper and draw lines of action with a marker through everything on the page: cars, people, furniture, flowers, etc. Look through sports magazines and draw the line of action through the athletes, then draw the gestures on top of that. This will give you very good practice in identifying the line of action and gesture in a short amount of time; the figures on the page are already translated into two dimensions for you. You can also draw the gestures on a separate sheet of paper, referring back to the magazine to check your proportions and accuracy of the gesture.

*Practical Application: Drawing Your Own Hand*

Purpose: To be able to capture vital information about a dynamic subject.

Do this exercise the same way as the last one. First, find the line of action in your non-drawing hand. Then start to add information to that action line. You can stop your drawing when you feel you have effectively communicated everything important about what your hand is doing in space (fig. 13). Remember, you are not drawing fingers with fingernails or the wrinkles on

your knuckles, you are trying to capture the thrust of your hand and fingers through space. Include a bit of your arm at the wrist as well in order to capture any movement in the wrist joint.

*Figure 13: Two minute hand gestures. Note how the most important information about the hands has been conveyed economically with a minimum of detail.*

Keep in mind, the most important information in an action line is where it begins, ends, and what it does in-between those points. If it helps, think of a gesture drawing as just a collection of interrelated action lines. There is an action line for the back of your thumb, and there is one for the front of it. When you connect them you get the gesture of the thumb. If

someone were making a peace-sign, there are action lines for the first and second fingers, one for the folded fingers, one for the thumb, etc.

These hand gestures should take one to two minutes each. Do several per page, and keep drawing them all class, taking breaks every twenty minutes or so. Do not draw detail; keep the drawings simple and economical. If you are dissatisfied with a drawing, try and find out why it is not working. Re-do that same hand gesture next to the ineffective drawing, and if the second drawing turns out better, find out why. This will build your own vocabulary of what to look for and use in a gesture drawing. Do not tighten up when doing these drawings, keep your lines fluid, but still try and achieve proportional accuracy and an accurate gesture. The viewer should be able to look at your drawing and instantly tell what your hand was doing.

Further Study

Go to a public space and try to capture the action and/or gesture of people as they wait to cross streets, stop to look at something, or as they walk by. Again, try and capture all of the most important information about the figure in space as economically and accurately as possible.

**Measuring**

Measuring techniques are very helpful while drawing. They also train your eye and perception. With much practice, these techniques can become almost automatic, and done by the eye alone. There are many techniques when it comes to measuring. Some of the most common and most useful include the use of horizontal and vertical plumb lines, angle comparison, comparative measurement, and optical reduction.

Since the two goals of measuring are accuracy and training your eye, all of the following techniques should be approached in the same way: make a mark, measure to check it, adjust your mark, and then measure again to verify your mark. If it is still wrong, repeat the measurement. You must measure again after you have adjusted your mark, because you do not want to continue your drawing and base other decisions upon incorrect information. All of these steps are crucial; it is important to attempt an accurate mark before you measure to sharpen your perception, and you should ensure its accuracy before continuing.

*Comparative Measurement*

Comparative measurement is a very powerful measuring technique, and has too many applications to fully explore in this context. The basics will be covered, and they are finding centers and comparing height to width. The basic procedure with any measuring technique is the same. First, make a mark on your drawing that is your best guess, then measure, comparing your drawing to your subject. If your initial mark was correct, leave it and move on. If it was incorrect, fix it, and then check your new mark to verify that it is correct. This last step is important and can be overlooked very easily. It can create many problems in a drawing to base measurements off of something you thought you had fixed, only to find out later that it was still off significantly, and you have to rework major areas of the drawing.

It is often very helpful to set the overall proportion of your drawing, and then mark a point on your drawing that represents the center of an object or arrangement. If your centers and extremes are correct then your drawing will be less prone to proportional and shape errors, and if you do draw something incorrectly you will no only be able to track it down easier, but the damage will likely have been contained within the the measured marks.

It takes less than five minutes to measure out the boundaries of an object, and it could take many times that trying to unravel a proportional error made in the very beginning of a drawing. Most mistakes are made during the first few minutes of a drawing; these are also the easiest to make, the most damaging to the accuracy of the drawing, and the most difficult to fix. Basic proportion and a bit of measuring in the beginning of a drawing can avoid a lot of extra work and wasted time.

This cannot be stressed enough; take your time and get the basic shapes correct. It is better to get it right, or very close to right the first time than to have to go back over and over again. If it takes you a few extra minutes in the beginning to set up a proportionally strong drawing it is very worth it; faster is not better, better is faster. This means that rushing through something can result in mistakes, while taking the time to do things right the first time will save you time in the long run. Slow down and get it right.

*Practical Application: Comparative Measuring Techniques*

Purpose: To learn how to place an object where you want it on a page, and how to determine its height vs. width proportion with confidence.

Materials: Simple subject, like a coffee mug or a box.

To place your object on the page, you must first establish the extreme left and right points, as well as the extreme top and bottom points on your paper. This will fix the object at a certain place on your page.

First, determine whether or not the object is wider than it is tall, or taller than it is wide. If it is difficult to determine this by eye, then you must use your knitting needle. Extend your needle at arm's length, and set the point of the needle at one side of the object at the widest point, and slide your thumb until it matches the widest point of the opposing side.

Next, without moving your thumb, rotate your arm until the needle is vertical. Measure the height against your thumb mark for the width: if the thumb mark extends beyond the height of the object, then it is wider than it is tall. If the thumb mark falls short of the height of the object, then the object is taller than it is wide (fig. 14).

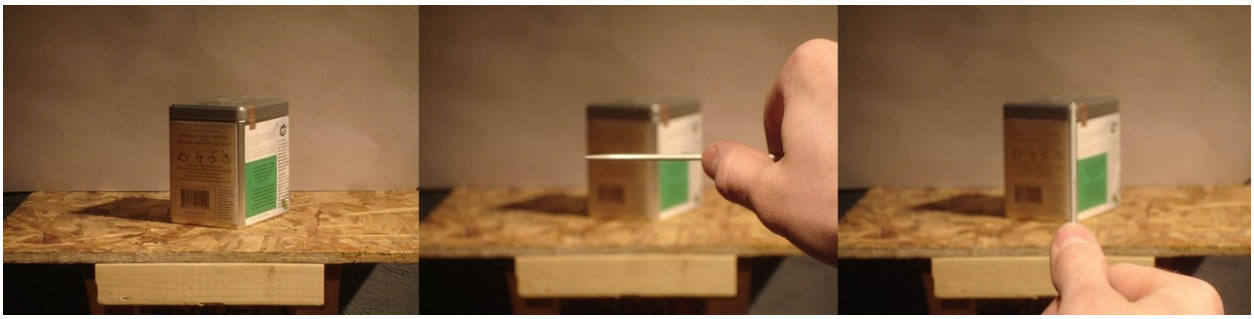

*Figure 14: The first picture shows the subject. The height and width measurements are fairly close, so they should be measured to check which one is greater. The second picture shows the needle, held at arm's length, with the entire width of the box between the thumb and the needle's point. The third drawing shows the needle, without moving the thumb, checking the width against the height. In this case the width falls slightly short of the height.*

Make two marks on your paper that will correspond to the larger measurement (fig. 15). In this example we will use the height, because it was slightly larger than the width. These marks can be any distance apart as long as the drawing will not end up off of the paper. Remember that these marks set the overall size of your drawing, and here is where you should be considering how big your drawing will end

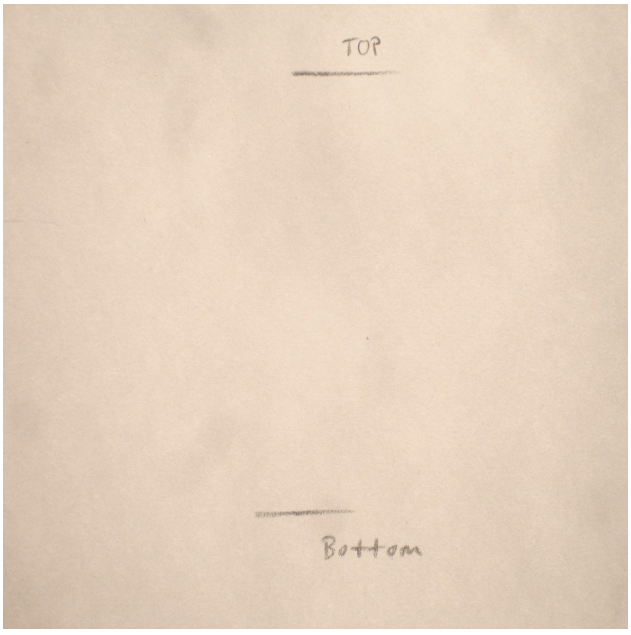


*Figure 15: Establishing the height on the page. These marks will not move.*

up, and where it will be on the page. It is important to note that these marks are the standard by which the rest of your drawing will be measured against. These two marks are correct; if you move them later in the drawing, the proportions of your drawing will drift worse and worse and there will be a lot of reconstruction needed.

Next, see how many times the smaller measurement will go into the larger one. Estimate the height to width and make marks on your paper as a guess to the smaller measurement (in our example it is the width, fig. 16). Now that you have made a mark you must now check it by measuring.

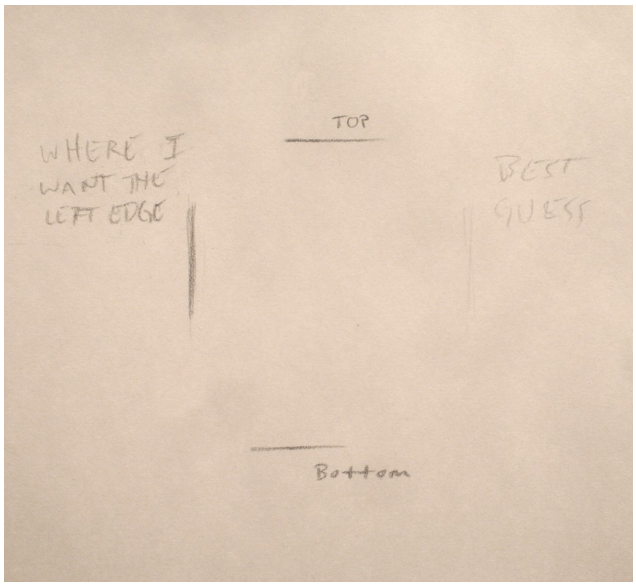


*Figure 16: The top, bottom and the left extremes are established, and the right extreme is estimated.*

Get your thumb mark for the width of the object. Rotate your arm, and visually check how many times the width goes into the height. It might be three, four, two and a half, or five sixths. Whatever it is, make the marks on your paper, then go back and double check with your needle that the height to width relationship of your drawing matches that of your subject (fig. 17). Again, the rest of the measurements will be based off of these extremes, so take your time, double check and get it right (fig. 18).

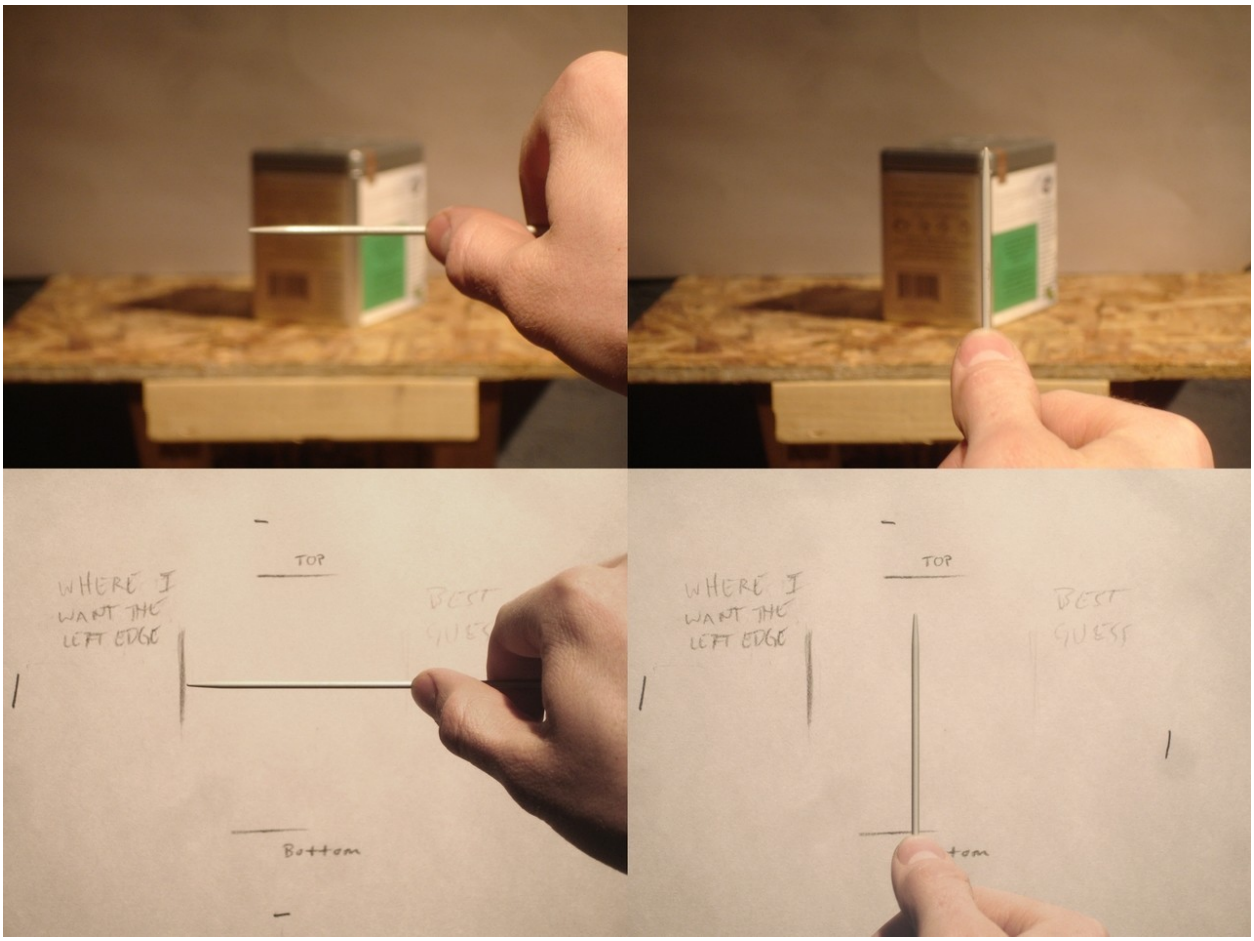


*Figure 17: In this example the width measurement comes a bit short of where it should be, meaning that the drawing must be made a little wider.*

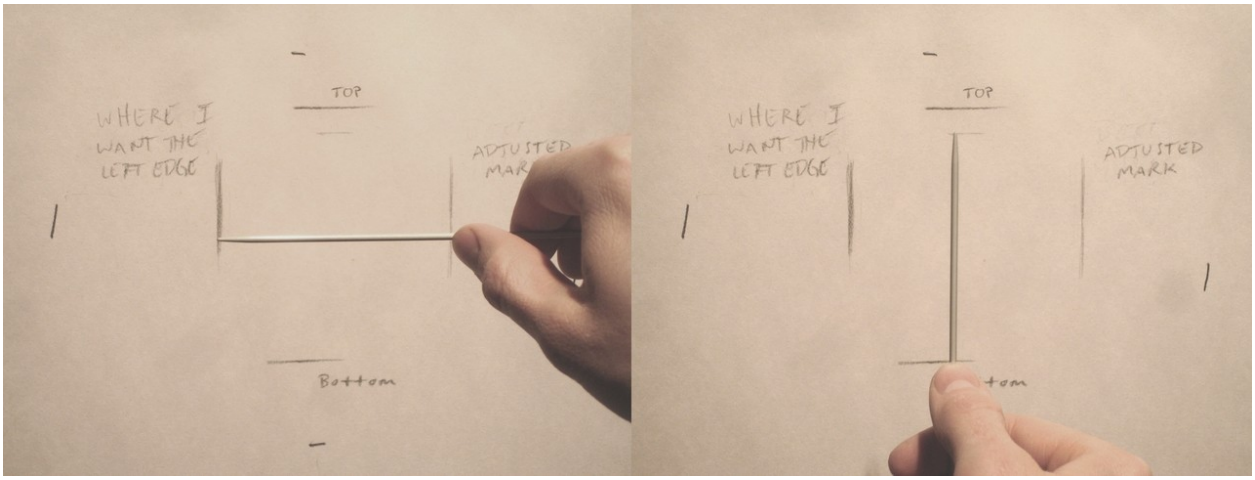


*Figure 18: The mark was adjusted, then double checked. The width measurement fell exactly where it should, so now the width and height are established.*

Draw vertical lines through your width measurements and horizontal lines through your top and bottom measurements (use light lines, fig. 19). You should now have a drawing of a box with the same height to width proportion as your subject. While you are drawing the object within, no part of the subject should extend out past the box, and the drawn object should touch the box in at least four places: the top, bottom, left and right extremes.

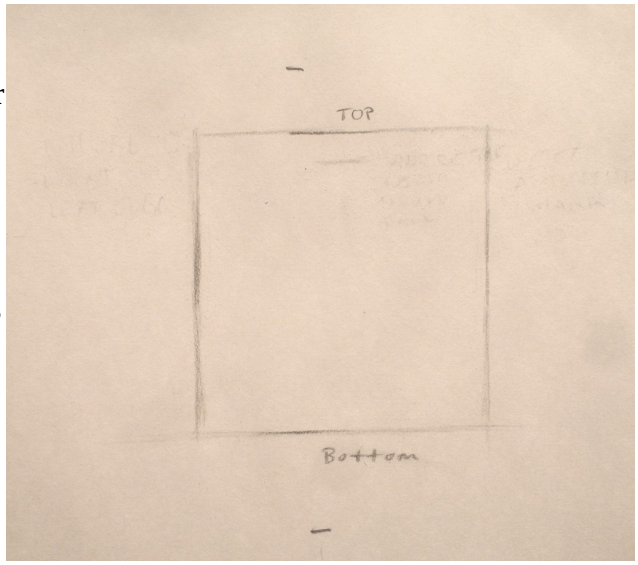

*Figure 19.*

Finding the Centers

To find the centers we will use the needle again. First find the center of your drawing. Make a mark where you think the center of the height of your bounding box is (fig. 20).

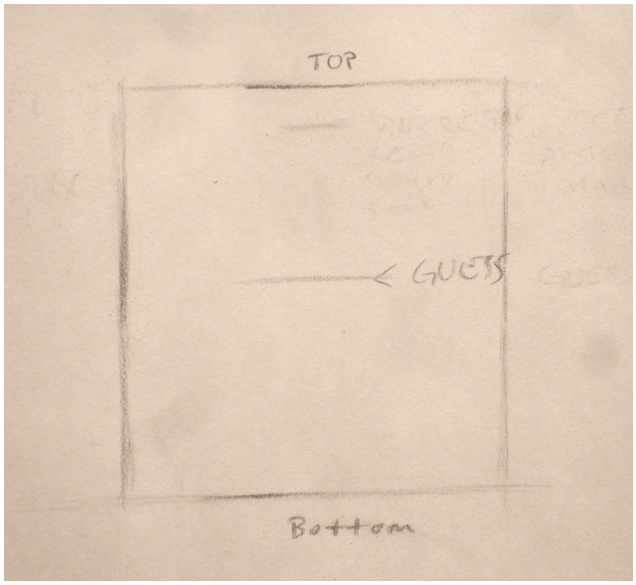

*Figure 20: Make your best guess for the vertical center.*

Then, use your needle held against the paper, holding the point of the needle on the center mark and sliding your finger to the edge of the box. Without moving your finger, move your needle over until your finger mark is on your center mark, and note where the tip of the needle ends up. If it falls within the box your center mark guess was too close to the first side you measured, and if the needle extends out past the box your mark was too close to the second side of the box (fig. 21).

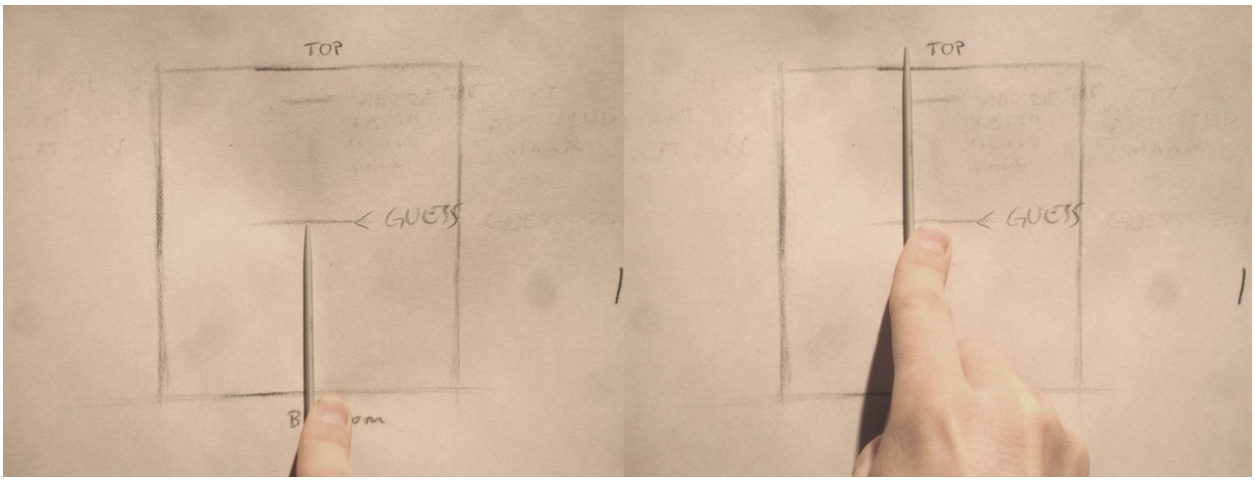


*Figure 21: The needle extends past the top, meaning the center mark was more than halfway up from the bottom.*

In both cases, the mark must move either up or down by one-half of the distance the second needle measurement was off. Again, take the time here to get this correct (fig. 22).

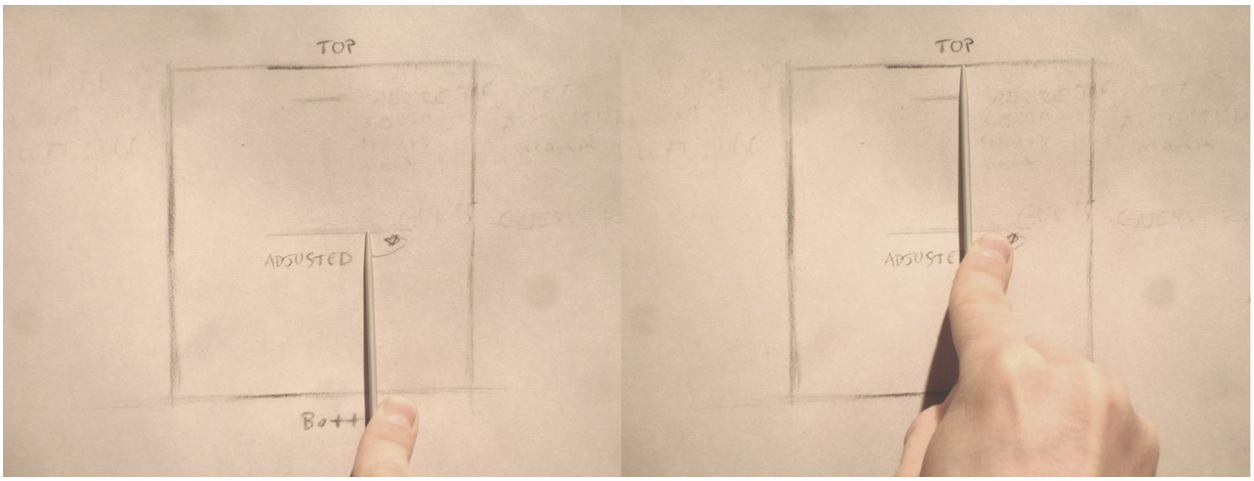


*Figure 22: Confirming that the adjusted center mark is exactly halfway between the top and bottom.*

Next, find the center of the width. Do the same procedure as above, only horizontally. Make a cross-hair of your width center mark and your height center mark, and you will now have the center of your box (fig. 23).

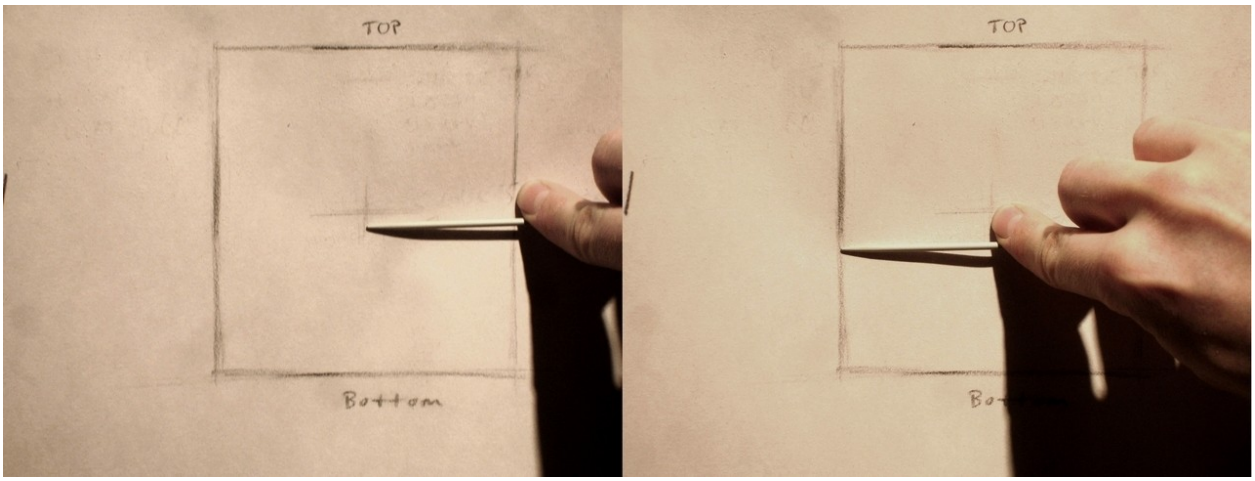


*Figure 23: Confirming the center of the width.*

Now, using the needle, find the center of your subject. This time you will make one measurement, guessing the half-way point, and move your arm to measure the other half. If your initial guess was off, readjust your thumb on your needle and try again until you get it as close as you can. You will have to visually note where the halfway point appears on your subject, and lock on to some information either at the center or very close to it, and then draw that information on your paper (fig. 24). It might be the edge of a shadow shape, some surface defect in a piece of ceramic, or the pubic bone on a life model. Your subject might not have a discernible center, in which case you might want to put a small piece of tape there.

*Figure 24: In this example the green shape begins almost exactly at the halfway mark. I made a mark in the drawing to represent my first guess at this diagonal.*

This process can be repeated for the quarter marks, and even the eighth marks, splitting the subject up into sixty-four square boxes! This is usually much more information than is needed, but for very complex subjects it might be the easiest way to get something correct. It also might not make any sense to find the centers for a particular subject, like a ball or something else with very little information in the center of the drawing. You should still find the major proportions.

Plumb Lines

Plumb lines, when used in drawing, are vertical or horizontal lines used to check vertical and horizontal alignments. Knitting needles, bicycle spokes and kebab skewers work very well. There are a few ways to use plumb lines. The most useful are finding the extreme top, bottom, left and right points of a subject or arrangement, checking alignments and checking angles..

To use a plumb line, hold your instrument (hereafter referred to as a knitting needle or just a needle) loosely from one end, letting gravity draw the needle down vertically. Alternately, you can hold the needle horizontally. If you are outdoors you can make sure your needle in held flat by comparing it to the actual horizon, and if you are indoors you can use architecture or the bottom of your drawing pad to reference a good horizontal plumb. You might also find horizontal by imagining a ball on the top of your needle and trying to balance it without letting it roll off (this actually works quite well).

Find your bounding box as described above, and find the centers if they might be helpful. Then, find where your subject touches your bounding box, relative to the centers or extremes, and make a mark on your paper there. Do this by moving your plumb toward your subject from the top, bottom, left and right, noting where your plumb line touches first (fig. 25).

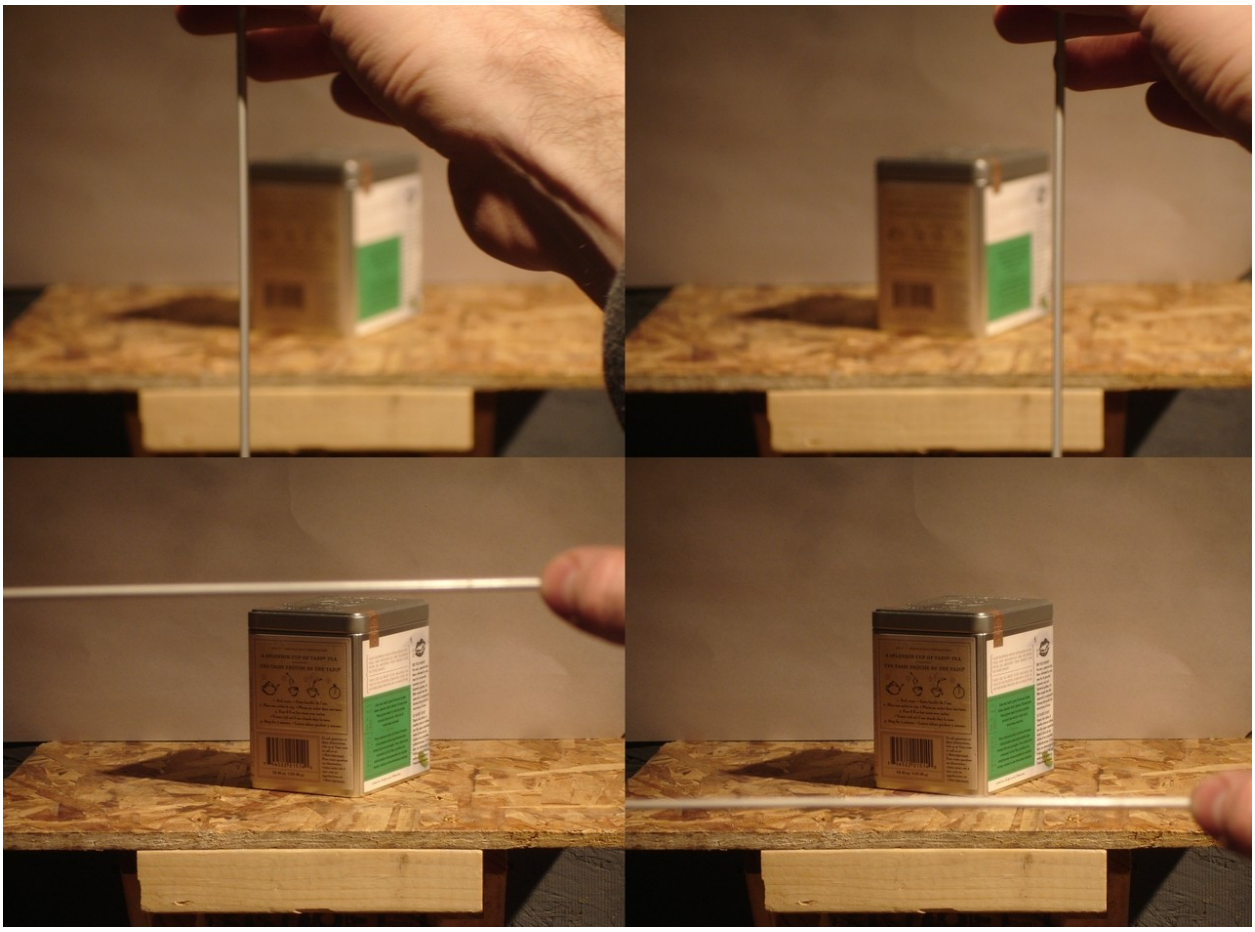

*Figure 25: This progression shows how to find left, right, top and bottom extremes of the subject by moving the plumb line towards the object and noting where it first touches. The left and right extremed are obvious; they are the vertical corners of the box. The top and bottom extremes were found by moving the plumb line toward the box and noting where it touched first.*

Do this for all four extremes, and check yourself by finding the angle between the extremes and checking that against your drawing (fig. 26). You should now have a box that represents the major proportion of the subject, with marks representing the widest and tallest points; including the center point, you have five very solid measured points to anchor the rest of your drawing to. These are very useful as landmarks against which to judge vertical and horizontal alignments. This sounds like a lot of measuring and checking, but it only takes a minute or two after a little practice, and could be one of the most time-saving techniques you ever learn.


*Figure 26: This progression shows first the estimated marks for the top and bottom, using the needle to find the angle, and then confirming the angle on the drawing.*

Now you can actually start drawing by filling in information on your subject, basing your judgments on your measured points. To place more points, compare them to your previous marks by checking with the needle, either vertically or horizontally, where the new point falls on your subject relative to the points you have already marked. With this technique you can create a web of measured points that will serve as a very strong foundation for the rest of your drawing.

To check vertical and horizontal alignments, move your plumb line across your subject, taking note of points that line up. Also note in which order your plumb lines are crossed, and make sure these same alignments are in your drawing (fig. 27).

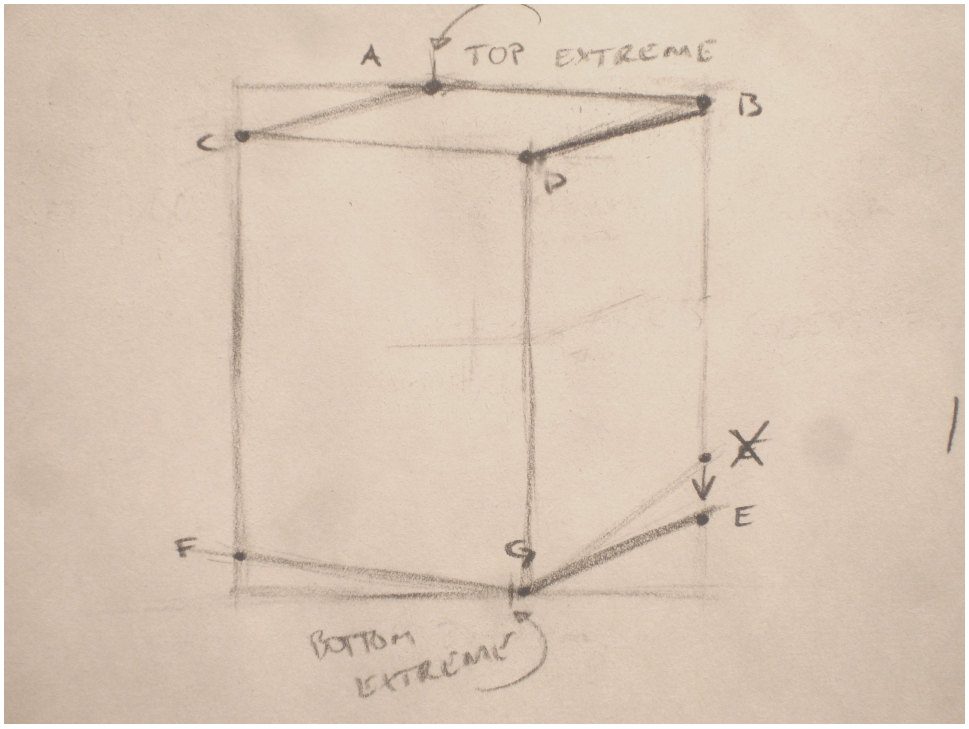


*Figure 27: If you swept your needle from top to bottom you would hit points A, B, C, and D in that order. If you swept from left to right, you would hit points C and F at the same time, then A, then D and G at the same time. Ensure that these arrangements match those in your subject.*

Comparing Angles

There are three main ways of checking angles: angle matching, comparison to vertical, and the eye-flick.

The first method uses the needle. First, visually estimate the angle to be matched, and make a line on your drawing where you think it should be. Then, to check that angle, hold the needle out at arm's length, and rotate your wrist so the angle of the needle is exactly the same as the target angle on the subject. Next keeping the angle of the needle the same, rotate at the waist (not at the shoulder) until the needle is between your eye and the drawing (fig. 28). You should be able to tell immediately whether or not your estimated angle was correct or incorrect, and which way to move it if it was wrong. It is important to note that the rotation should come from your spine at the waist, not the shoulder. The shoulder girdle is such a complex joint that there is

too much opportunity for your wrist to change angles during the rotation. Try and think about your waist as a rotating platform, and everything above your waist as rigid and immobile.

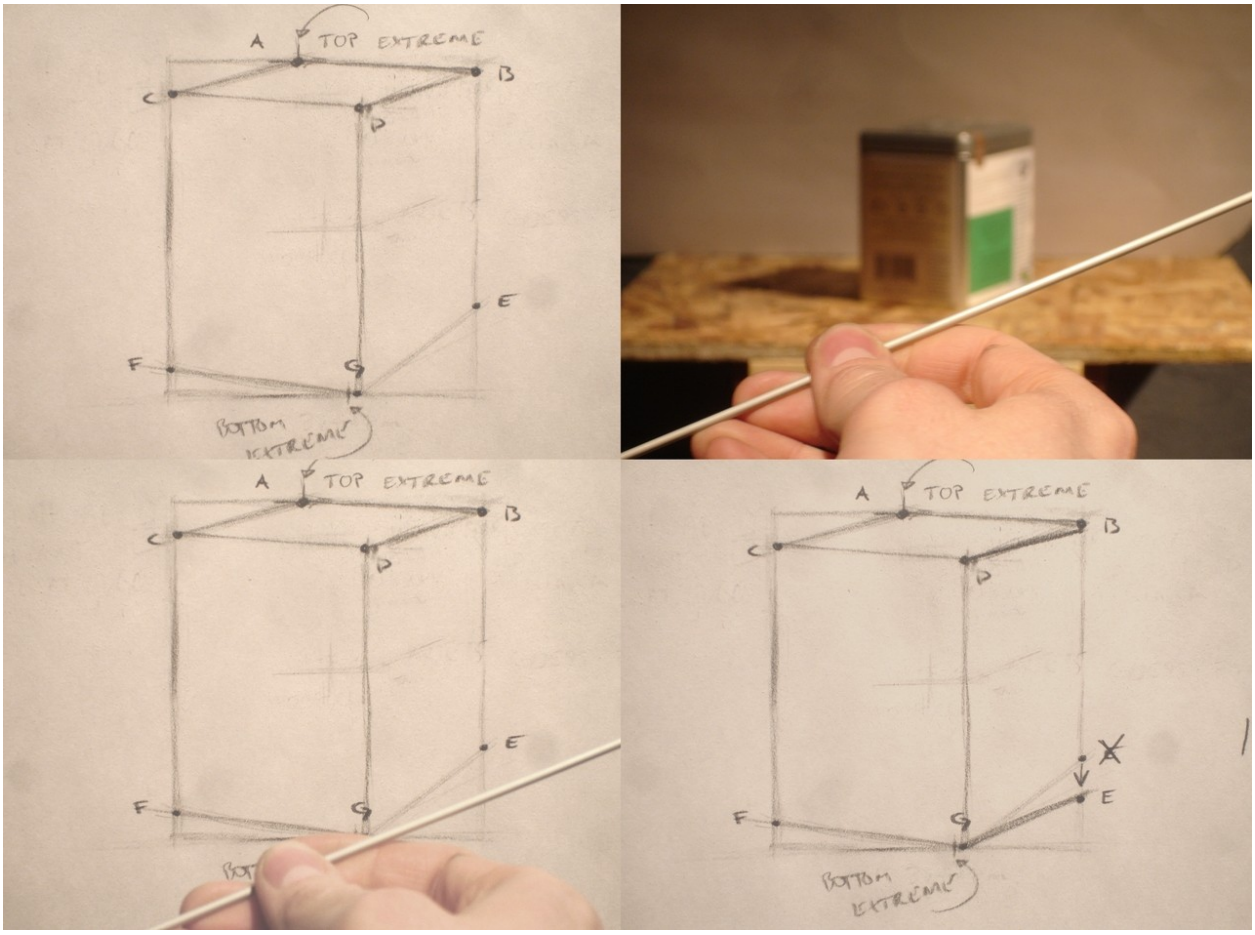


*Figure 28: This progression shows the first estimation at angle G-E, then checking the angle with the needle, checking that against the drawing, then the corrected angle.*

To compare an angle to vertical, first estimate the angle on your drawing as above. Then, hold your needle loosely from one end and let it dangle, held perfectly vertical by gravity. Compare the angle made between the angle on your subject and the needle, and then between the angle in your drawing and the needle (fig. 29). You should be able to tell the difference, and decide what, if anything, needs to be changed so that the angles match. Remember to always verify your new marks.

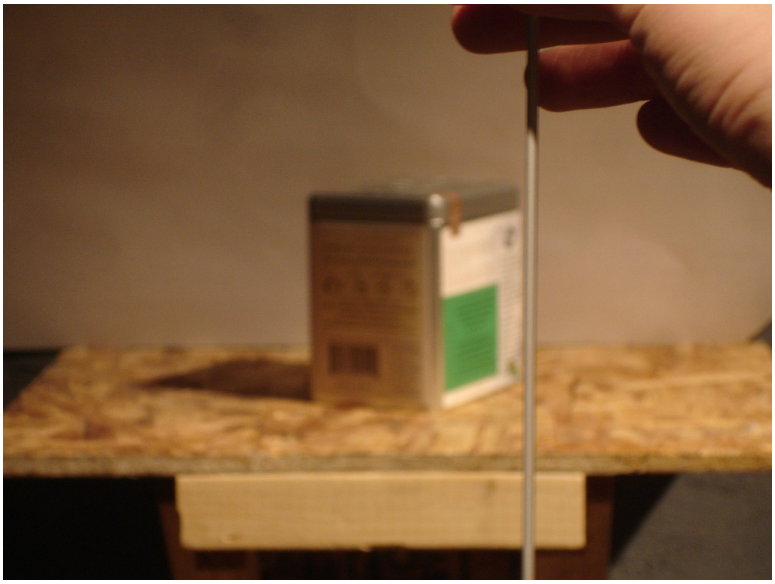

*Figure 29: Checking the lower right angle against the plumb line. You can use the imaginary triangle make by the space under the angle to check your drawing.*

The last technique is called the eye-flick. You do not need the needle for this step. It begins like the other two methods: estimate the angle and make a line on your drawing. Next, begin to look back and forth between the angle on the subject and the angle on the drawing, slowly at first to get your eyes used to the movement, but then faster and faster. If there is any difference between the angle it will appear to animate, and the angle will look like it is flickering back and forth. If your initial mark is correct you will not see any animation between the angles. This method can be very fast to use, but it takes some getting used to.

Further Study

Incorporate these techniques into every drawing you make. Internalize this sequence: make a mark, check the mark, adjust if necessary, and confirm the new mark by checking it. Whatever technique you use to check your accuracy, even if it is by eye, do it in this order.

To train your eye for accuracy even faster, add another step to this. Before you use the needle or plumb line to check a proportion or measurement, try to anticipate the result of your measurement. If you are going to check an angle, first check it in your mind's eye, then use the

needle and see if your measurement with your eye matched the measurement with the needle. This progression goes like this: make a best-guess mark, check it by eye, check it by actual measuring, and compare the results. You would then adjust your mark and confirm it first by using your eye and then by using the needle or some other technique. This is a very good way to begin to internalize and reduce your reliance on measuring techniques.

Optical Reduction

Optical reduction is a very fast and very powerful tool for checking a smaller length within a larger length, like the height of a head within the total height of a life-model, or the height of an ellipse within the total height of a coffee mug.

*Practical Application: Optical Reduction*

Purpose: To learn how to use optical reduction to find major proportions.

Materials: Complex still life object or life model.

You will need to use the needle for this technique. For this example we will be checking heights. As with all of the other measuring techniques, make your best guess mark on your drawing before you measure (fig. 30).

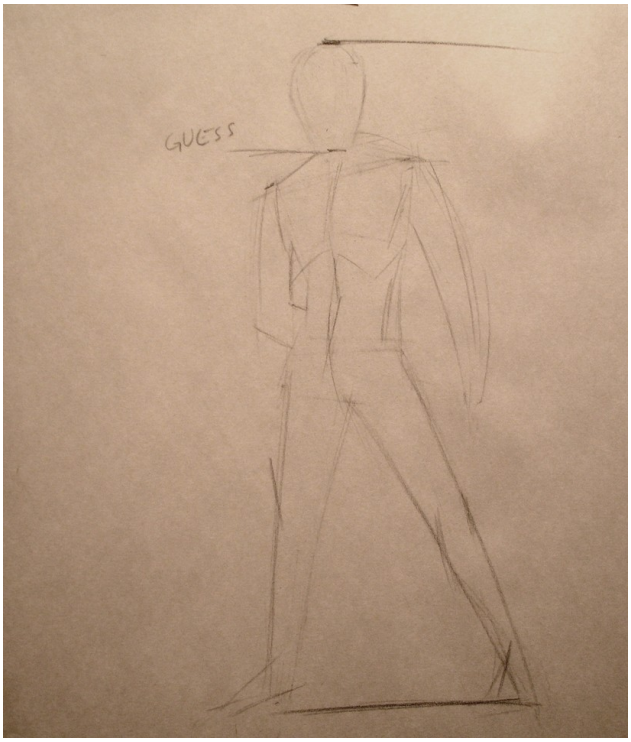


*Figure 30: The first rough sketch, with an estimation of the size of the head.*

Hold the needle, straight up and down in your dominant hand, between your eye and the subject. Place the point of the needle at the top of the subject, and slide your thumb and mark

the bottom of the subject. Your entire subject should now be contained between the point of the needle and the tip of your thumb.

Next, pinch the needle with your weak hand, making the tip of your thumb match up with the target point on your subject. Double check that the tip is still at the top, your strong thumb still matches the bottom, and your weak-hand thumb matches the target point (fig. 31).

*Figure 31: The tip of the right thumb (visible at the bottom) to the tip of the needle is the entire height of the model. The distance between the left thumb (at the top) and the tip of the needle is the height of the head. The needle held like this, without moving either thumb, is a very close representation of the ratio of the height of the head within the total height.*

Without moving either thumb, hold the needle between your eye and the drawing. Make sure the angle of the needle is the same as the angle of your paper; this is simplest when the paper is vertical on your easel, and you hold the needle vertically. If this angle is incorrect your measurement will be off and you will introduce distortion into your drawing.

Move it closer or farther from your eye until the tip of the needle and the tip of your strong hand thumb match the top and bottom marks on your drawing. Then, compare your target

mark to the tip of your weak-hand thumb. Adjust your mark accordingly and confirm that it is correct. This is one of the fastest and most accurate ways to measure comparatively, and is quite easy to master (fig. 32).

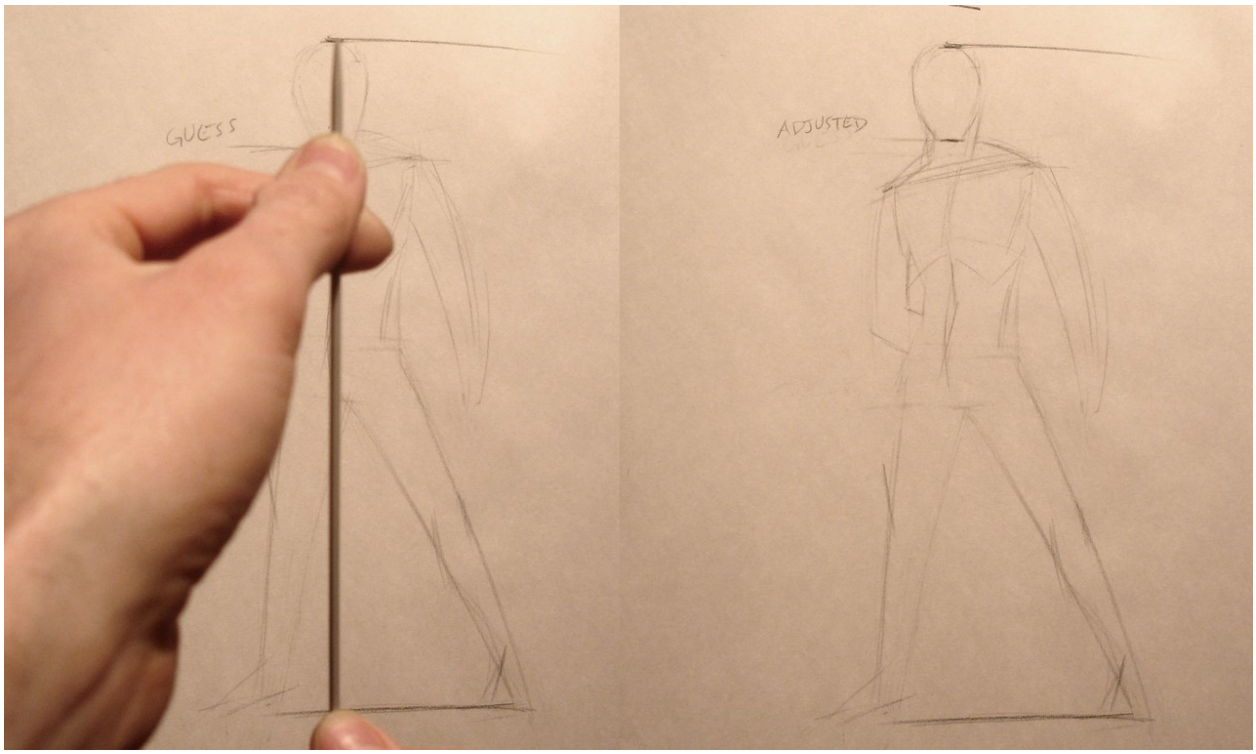


*Figure 32: Checking the measured ratio against the drawing. The head height was too big, so the mark was adjusted and confirmed.*

Find another major landmark that you wish to measure. Make your estimate again, and then use the needle and optical reduction to check and adjust your mark (fig. 33). See how the final drawing is in much better proportion to the first one (fig. 34).

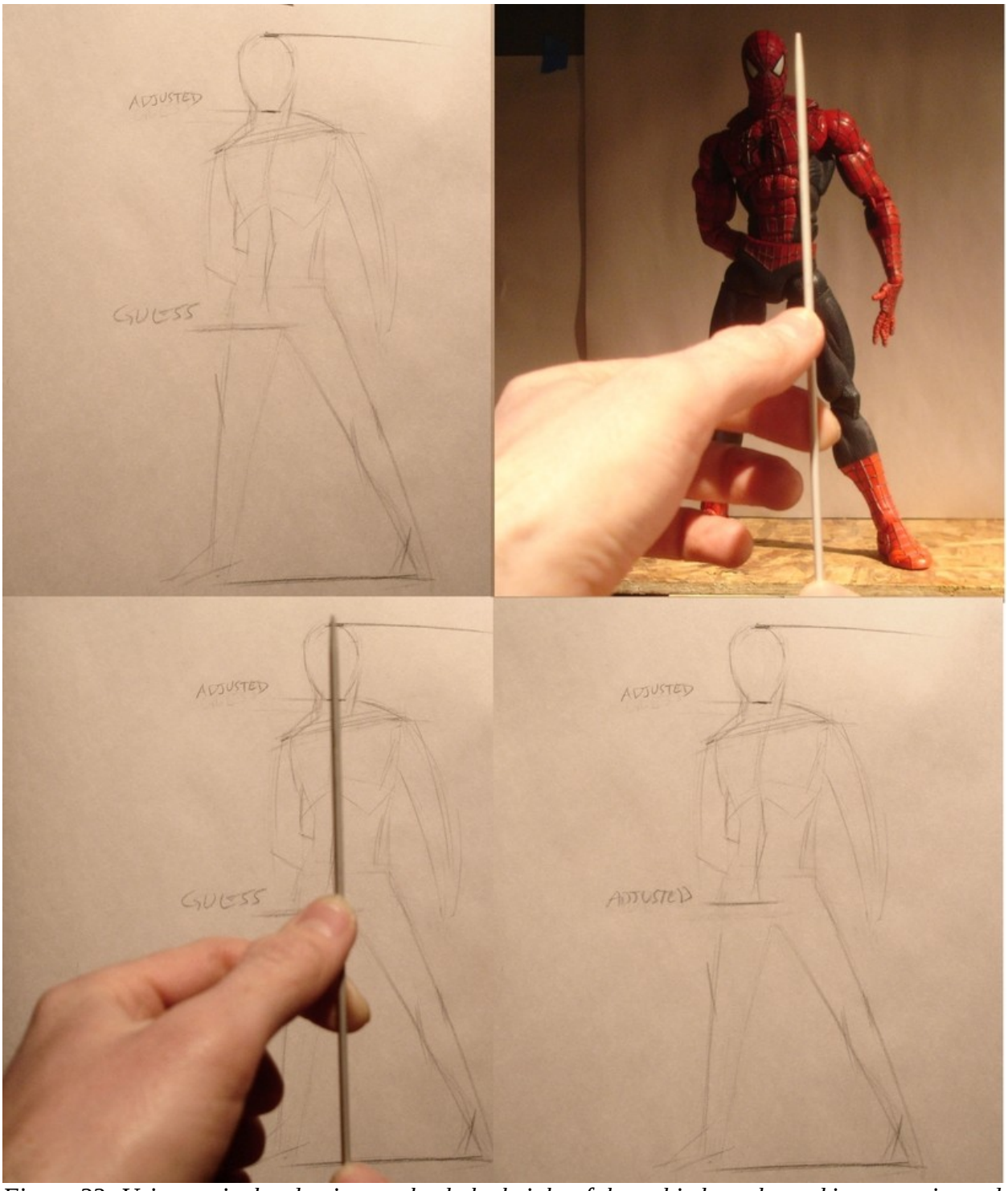


*Figure 33: Using optical reduction to check the height of the pubic bone by making an estimated mark, measuring the model, checking the drawing and then adjusting the mark. The location of the mark was then confirmed by optical reduction.*

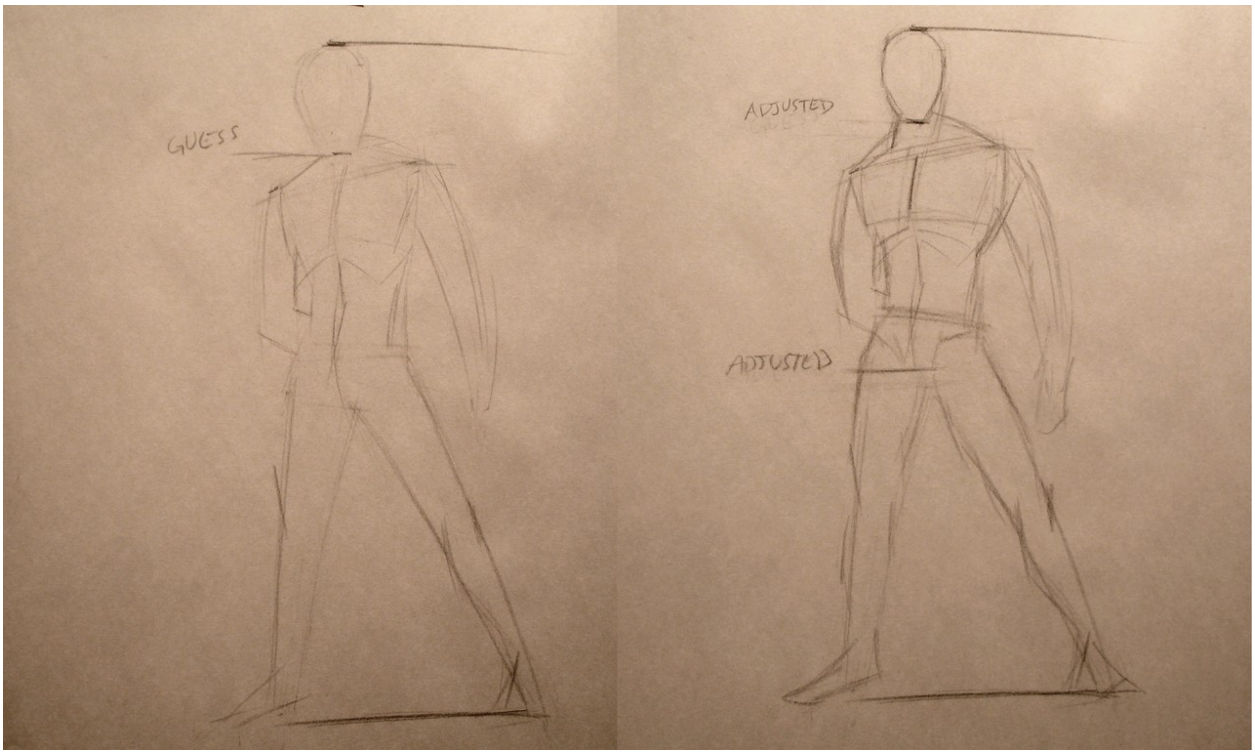


*Figure 34: Before and after using optical reduction to adjust the proportions. It took less than three minutes to adjust two major landmarks and improve the drawing dramatically. Note how the overall height of the drawing did not change.*

Further Study

Incorporate this method into your drawing routine. If you need to check the height of the ellipse of a mug against the total height of the mug, optical reduction may be the fastest and most accurate method to use. This method is very powerful, because it directly replicates the proportional ratios of the subject, and cuts out quite a few steps from comparative measurement. This technique is so fast that it can be used to double check another measurement technique very quickly.

To take any of these measuring techniques to the next level of learning and comprehension, begin to perform the measurement by eye before you physically check the drawing. Compare your internal measurement to the physical one, and try to figure out why you may have been off in your guesses.

*Practical Application: Relating Multiple Objects in Proportion*

Purpose: To be able to relate objects to each other in proportion.

Materials: Two objects of different sizes.

If you wish to represent more than one object in a single drawing, you must relate those objects in proportion to each other and their surroundings. For example, if you were to draw a basketball in front of a football, and the football was larger, your illusion of reality would suffer. If you were to draw a plate on a table, and the table top and plate were drawn in different perspectives they would not appear to occupy the same plane, and your illusion would suffer.

The human mind is especially visually and spatially sensitive, and is able to recognize incongruent visual information quite readily. Therefore, you must be vigilant to faithfully reproduce the relative sizes and proportions of your subjects, and correctly relate them to one another and their shared environment.

Set up two objects to draw. Place one overlapping the other to force the illusion of depth. On your paper first establish the upper, lower, left and right extremes of your entire setup (fig. 35). Remember to make your best judgment mark first, then measure, correct, and confirm your new mark. This will place your setup on the page.

*Figure 35.*

At this stage it is very easy to adjust the placement and scale of your drawing since there is so little time and effort invested in it; if you can think of a way to improve your composition, now is the time to implement it.

Having established the height to width proportion of the entire setup, now find the extreme points of each of the objects individually. use comparative measuring, angle checking and optical reduction to find these critical points. If the halfway marks are helpful find and confirm those as well (fig. 36).

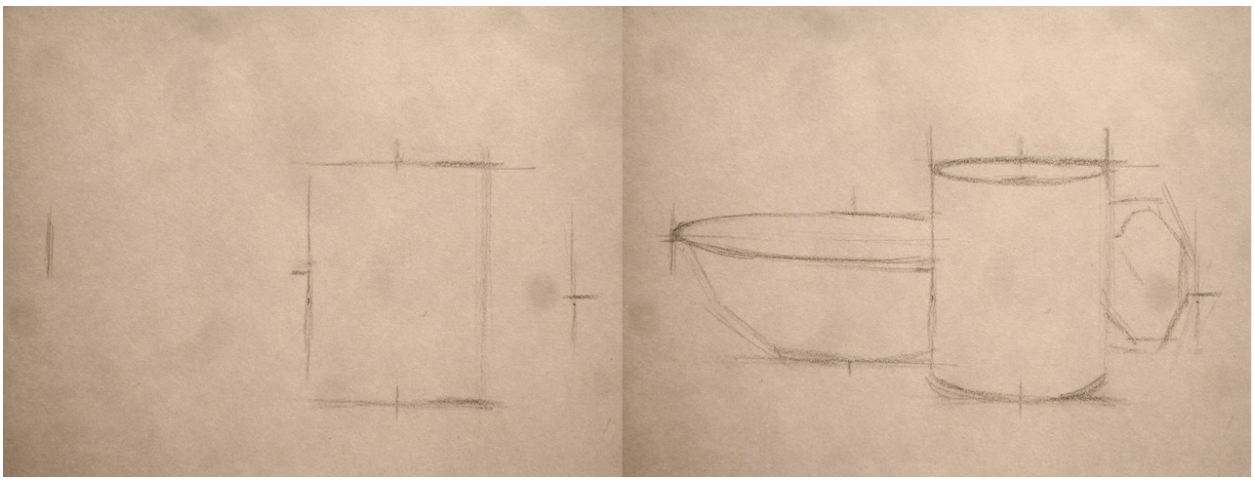

*Figure 36.*

The goal of all of this is to find important points, record them in your drawing, double-check their accuracy and then build the rest of the drawing around them. Once you place these points, do not move them. If you change the height of an object you have just changed its proportion and its relationship to everything else in the setup. If there is something wrong with your drawing, and you have already double checked the height to width proportions, then the problem lies with something inside those proportions. If you change a major proportion or other critical point then your entire drawing becomes distorted.

A critical point might be a major linear intersection, where one form intersects another, a halfway mark, a dimensional extreme, or anything else that is easy to see and important to the

accuracy of the drawing. Once your critical points are placed, draw the rest of the objects relating to those points (fig. 37).

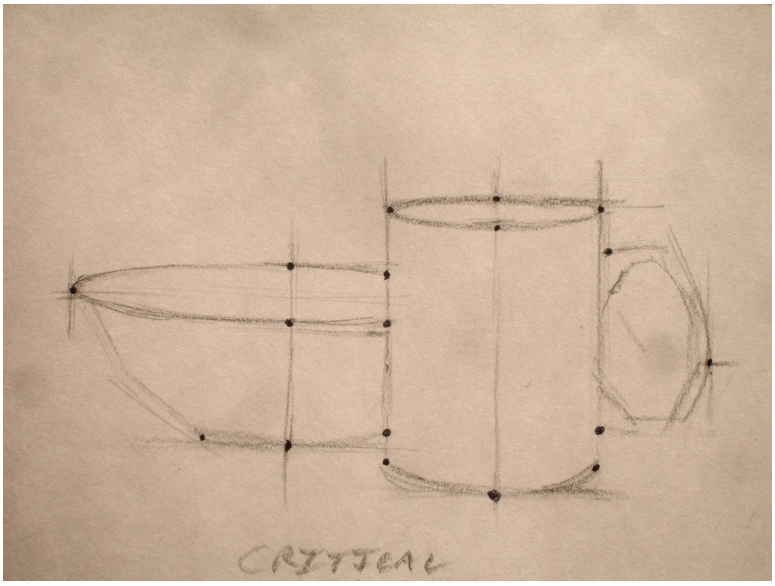

*Figure 37: The rest of the information, in simple curves and straight lines was filled in by connecting critical points.*

Further Study

Whenever placing a setup on a page, consider the entire arrangement as a single object first and use that large shape conception to place the arrangement on the page in proportion. During the regular course of your day find the critical points on objects with your eye.

## Design and Composition

The composition of your picture is critical for its success. Compositional can be broadly defined as the arrangement of the masses and information in your drawing. Masses can be things like areas of colors or value, and information can be things like linear information, converging lines, areas of high contrast, etc. To put it another way, composition is the big design of your picture: the skeleton on which you hang any detail or modeling.

### *Framing*

Framing, in the compositional sense, means the placement of your subject within the format of the support. It does not mean putting a frame around your picture to hang it on the wall. When composing your drawing take into account that if you were to mat it for display you would lose a bit of height and width due to the overlap of the mat on the paper. Before you begin a drawing you should consider the proportions of the support; should it be square, a portrait or landscape? More rectangular or squarish? Large or small? Try and pick the size and shape of your support to help communicate the meaning of your drawing.

### *Light/ Dark Patterns*

The main pattern of light and dark can present itself in two main ways. First, you can think of the light as anywhere in your subject that is receiving direct light and the dark as anywhere that is in shadow. This is called a notan (Japanese for “light dark”). A notan can be an extremely helpful starting point for rendering a drawing.

The other way might be helpful for situations without a clear light source, like natural light from the sky on overcast days. In this situation light and shadow may not be apparent, and the light vs. dark pattern will just be all of the values that can be grouped as lights vs. all of the values that can be grouped as darks. This arrangement my not be as helpful as a notan for rendering, but can be just as useful for working out a composition.

You want to have an interesting light and dark pattern in your picture. If the pattern is static the picture as a whole might be uninteresting, no matter how good the rest of it is. When you are setting up your objects, and when you are framing them on your paper, try and look for a pleasing, dynamic arrangement of light and dark patterns.

*Focal Point*

The focal point is very important for a picture. It is the area around which the picture revolves. It can be a point of high contrast, special interest, tension, or anything else that out-competes the rest of the picture for attention. In a portrait, the focal point is usually the eyes, or just one eye. In a still life it is often the area of highest contrast. In a figure painting it could be a point of tension between two figures. A famous examples of this type of focal point is the space between the fingers of Adam and God on the ceiling of the Sistine Chapel.

Focal points are often off-center, creating a kind of potential energy that keeps the viewer looking through the picture. If the focal point was dead-center, the viewer looks at it, and is left with no obvious route through the picture. If the focal point is off in one corner, the viewer is very likely to search the rest of the painting for the information that balances the focal point.

*Points of Interest*

A point of interest, sometimes called an eye-rest, is a piece of information that calls for attention but is secondary to the focal point. These secondary points of interest serve to keep the viewer engaged in the composition and keep their eye moving through the picture. A good example of this is the smile on Leonardo Da Vinci's “Mona Lisa”. In the “Mona Lisa” the eyes are the focal point, like most other portraits, but there are also other points if interest throughout the painting like the smile, her hands and the landscape in the background.

*Common Compositional Errors*

There are some very common compositional errors. The composition is the overall design of the drawing. A drawing that is poorly composed, can be a failure, despite being masterfully executed in every other respect. There are some simple things you should be aware of. These are not unbreakable rules, but they should be violated carefully, deliberately and for a purpose, not by accident or inattention.

Static Compositions

A static composition lacks the asymmetry that is the easiest way to get the viewer's eye to travel around the picture (fig. 38). Static compositions can be defined by a centered focal point or a composition balanced by objects of equal sizes, shapes and values on either side of the picture. Generally the values, sizes, colors and shapes of the elements in your drawing should be used to make a balanced composition, but one that is asymmetrical enough to move the viewer's eye.

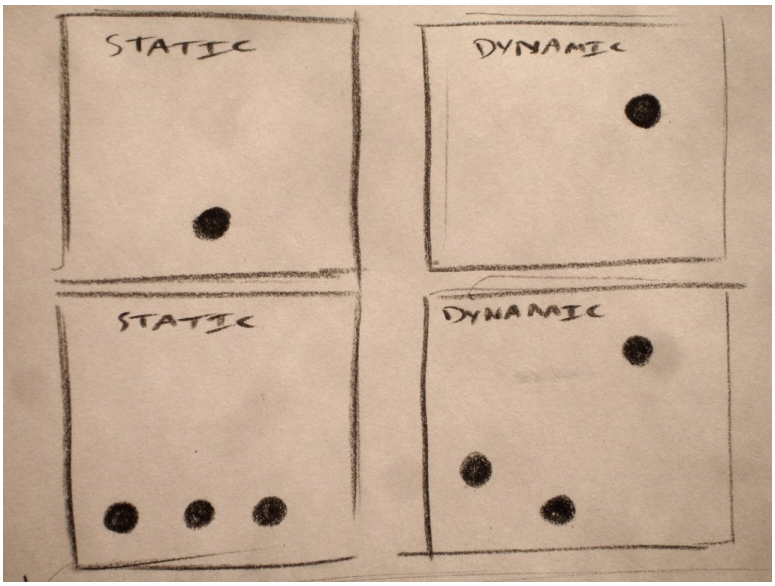


*Figure 38.*

Centering

A static composition can be quite boring. One of the most static compositions is a single object perfectly centered in a square picture. It is very easy to avoid this and introduce some dynamics into your drawing early on, but it is very difficult to rearrange an entire composition after you have invested a lot of effort into it only to discover that it is boring (fig. 39).

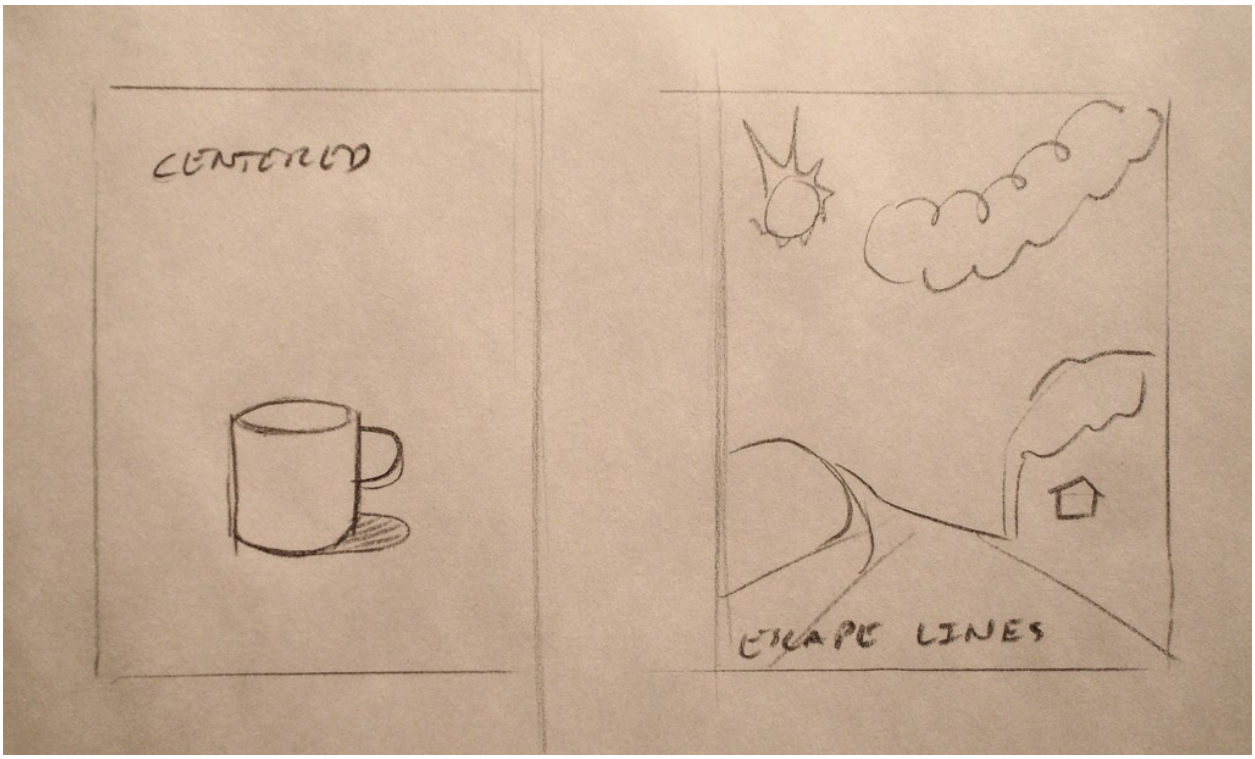


*Figure 39: The picture on the left shows a centered subject: a static, boring composition with no movement. The Picture on the right illustrated how poorly arranged information can make the picture difficult to look at for any period of time. Notice how the picture seems slippery to your eye. All of the elements tend to throw your eye out of the picture rather than keep it circulating within it.*

A simple way to avoid this, and many other problems, is to do a thumbnail sketch. A thumbnail sketch is so-called because it is small and quick. They require little effort, and they are well worth it because they can expose major flaws in a composition before you spend any time working on a drawing. Since they are so small (from an inch square to no bigger than around five inches or so on the longer side), they can be thought of as looking at a picture from

very far away, thereby highlighting the major design, linear rhythms and patterns of light and dark. They also allow you to try out multiple framings and arrangements quickly, giving you options to choose from before you commit to anything on your actual drawing.

Escape Lines

These are lines that can throw the viewer's eye right out of the drawing, or information that draws the eye to the edge of the picture thereby destroying the illusion of depth (fig. 39). The opposite of an escape line is any type of information that adds interest to your picture by grabbing attention or otherwise directing the eye into and through the picture.

Kissing Edges

A kissing edge is when two contours meet at a point without overlapping. This is not only visually confusing for the viewer but is also a missed opportunity to interpose one form in front of another, giving the viewer a strong indication of depth. When two contours meet at a point they appear to lock together and occupy the same plane (fig. 40). It is also a point of tension and can be quite distracting. The solution is easy; either rearrange the subject, change your observation point, or take creative license to either overlap the objects or introduce space between them.

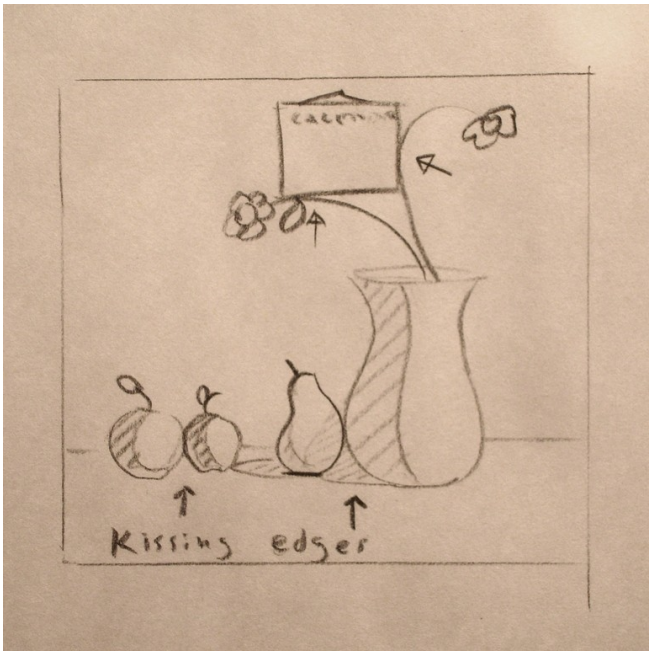


*Figure 40: A kissing edge occurs when two contours meet at a point. Even if the objects are at different depths, like the picture frame on the wall and the flowers, if their contours kiss edges then they will appear to occupy the same plane. This destroys the illusion of depth.*

*Practical Application: Composition Exercises*

Purpose: To gain awareness of compositional principles.

The first exercise will focus on framing pleasing, dynamic light and dark patterns. On your page, draw a number of rectangles of different sizes and different proportions. Using only two values (the white of the paper and a fairly dark charcoal value) fill the rectangle with areas of light and dark (fig. 41). Try curved sections straight sections, horizontals, verticals, etc. Pick out the best and worst compositions on your page, and try to figure out what went right or wrong.

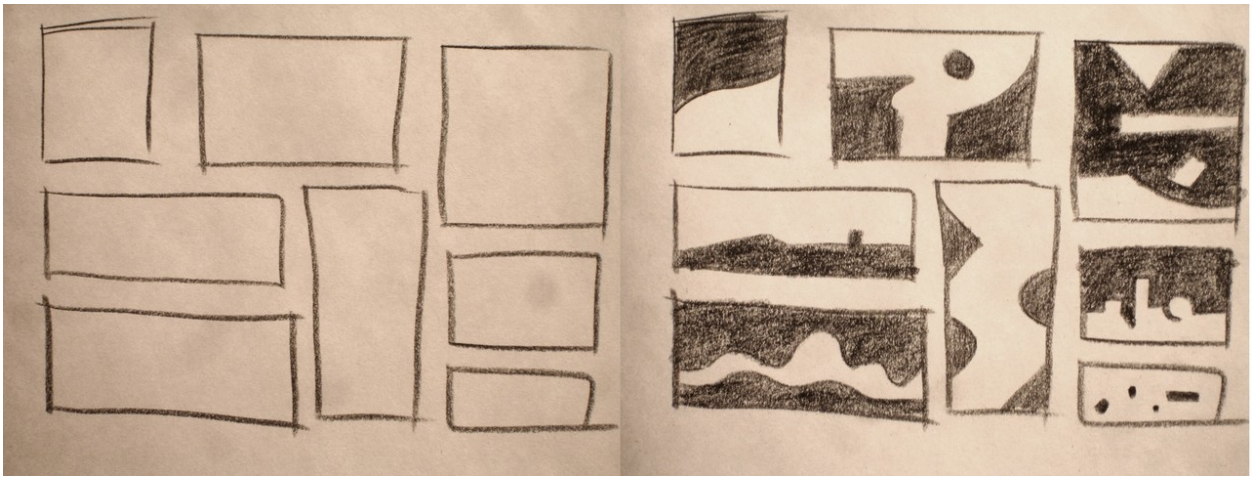

*Figure 41: Filling the rectangles with patterns of only two values.*

Next, repeat the previous exercise but start your drawings by making a mark somewhere on your paper, off-center, that you want to be the focal point. Build the rest of your drawing around that mark, using your linear information and light and dark patterns to draw the viewer towards that spot (fig. 42). Again, evaluate your drawings. What makes the good ones good? What makes the less successful ones fall short?

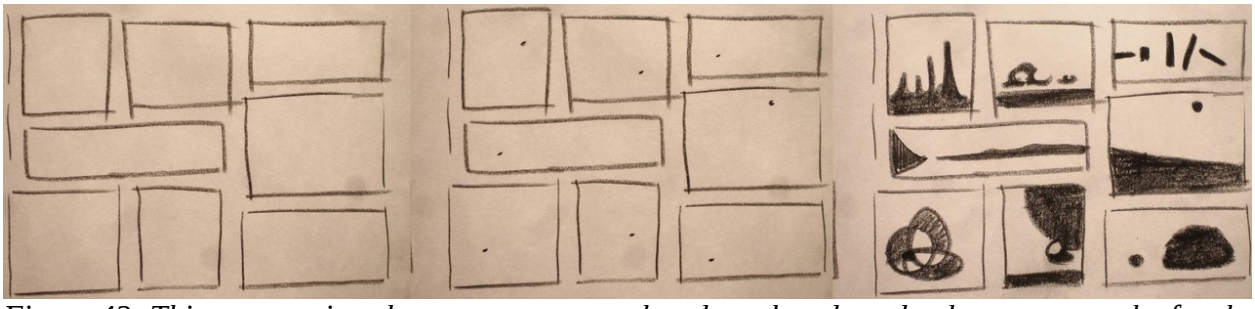

*Figure 42: This progression shows empty rectangles, dots placed randomly to serve as the focal point, and finally patterns of two values arranged to draw the viewer toward the focal point.*

Further Study

Study old master drawings. Use tracing paper as an overlay. Find the focal point and points of interest. Next, find the linear information or the masses that draw your eye toward those points. Try to look at the drawing slowly, that is, keep your eye from darting around too quickly. Take note of where you look in the picture, and in what order, and try and figure out why your eye was drawn to those places in that order. Look for intentional devices employed by the artist to direct your eye.

## Common Drawing Errors

### *Accuracy in Drawings*

There are quite a few major issues that arise in drawings that can be easily avoided with awareness and a little diligence. Once you know to look for them and some strategies for avoiding and undoing them you will be able to focus more of your energy on drawing instead of chasing errors around.

As soon as you put your first marks on the paper, there is one set of accompanying marks that will create an accurate portrayal of the subject: one correct arrangement of linear relationships, and an infinite number of incorrect ones. You can measure and observe and arrive at the correct drawing with attention and effort. Sometimes, however, correctness does not mean that the drawing is good, or that it could not be improved upon. One of the best advantages draftsmen have over cameras is that we can omit, emphasize, embellish, and improve our drawings according to our aesthetic.

At this stage, however, you should be striving for accuracy in your drawing. The ability to improve nature while making a quick sketch is the result of profound understanding, technical facility and practice. It is not the result of not being able to draw accurately and calling something good enough or close enough. You must be able to draw accurately, and then you can dial that attention to accuracy back to a level that fits with your goals. You will also be able to make informed deviations from nature that enhance the picture. Without having a good understanding of nature and an accurate foundation you cannot transcend nature.

Some of the biggest impediments to accuracy are easily avoidable errors in drawing. The trick to identifying, fixing, and avoiding these drawing errors can be generalized; draw the information that you observe from the object while ignoring what you know, or think you know, about the object. This statement does not apply to the entire drawing; if you are drawing a

portrait, and ignore the humanity of the subject while only drawing optical information, your drawing may turn out lifeless and flat. You have to strike a balance and rhythm in your working habits between accuracy and sensitivity to your subject. You have to be able to switch gears between measuring and constructing an accurate drawing and assessing the drawing as a whole. The drawing as a whole is what is important, not the accuracy of its parts, but in order for the drawing as a whole to work the parts must fit.

*Common Drawing Errors*

There are a few major drawing errors that are very easy to make; fortunately they are also easy to avoid once you know about them, why they occur, and how to fix them.

Table Top Effect

This is commonly experienced in beginner drawings. Since sight is a 3-D sense, and integrates with our other senses, we tend to see in a very tactile way. This knowledge of the interactive potential of an object can influence our perceived visual experience of an object. In short, we know that a table is a surface upon which to rest other objects, so the top surface of the table gets far more emphasis in our minds and our drawings. The relative height of the table in the drawing is increased, and it appears to tip forward (fig. 43).

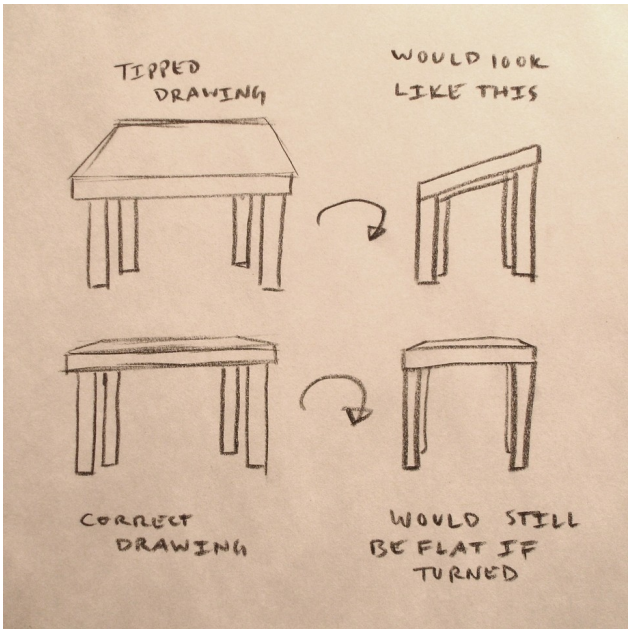


*Figure 43: This drawing illustrates the table-top effect. The table in the upper right would look like it was built on a slant if you imagined it rotated ninety degrees. The perspective on the lower table is much more correct.*

This drawing error can wreak havoc on a drawing. Perspectivally, you are telling your viewer that they are looking down on a table, while looking ahead at whatever objects are on the surface. The objects can appear ready to roll forward. If you use the drawing of the table top to make other judgments about where to place other things in your drawing, they will be incorrect. You might end up chasing the drawing, that is, fixing one symptom only to find another to fix: wrestling with the drawing trying to force things into an incorrect shape instead of resolving the underlying issues.

The table-top tipping effect also appears in objects in perspective, where there is a tendency to peel up the back corner of a box or something by making its angle too obtuse (fig. 44).

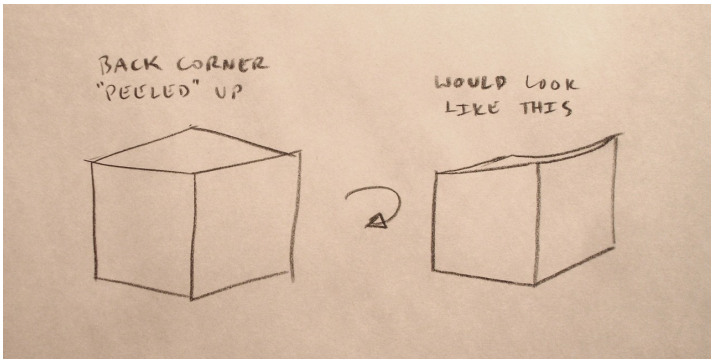

*Figure 44.*

This type of symbolic intrusion can appear in other types of objects. It seems that objects and parts of objects that we interact with on a regular basis become distorted. For example, it is common to see a beginner drawing of a mug with a tipped forward upper lip and an over-emphasized handle, because we sip from the lip and we hold the handle. Drawings of doors will have doorknobs that are too large. Chairs will be tipped forward, emphasizing the sitting surface. The solution to this common error, as with most others, is a combination of awareness and measuring.

Frontalizing

If we can think of the table-top effect as a tipping error, frontalizing is a rotation error. This error results from the tendency to rotate objects in perspective so that they are facing us. This is again a manifestation of the way we experience the world intruding upon our drawings. This error or the table-top effect are usually to blame for errors in perspective. One example of

this is if we see a box that is almost head on, but not quite, we are likely to draw the box more square than it actually should be (fig. 45). Another example is when we see just a little of the side of an object, but we draw that side with much more width than we actually see.

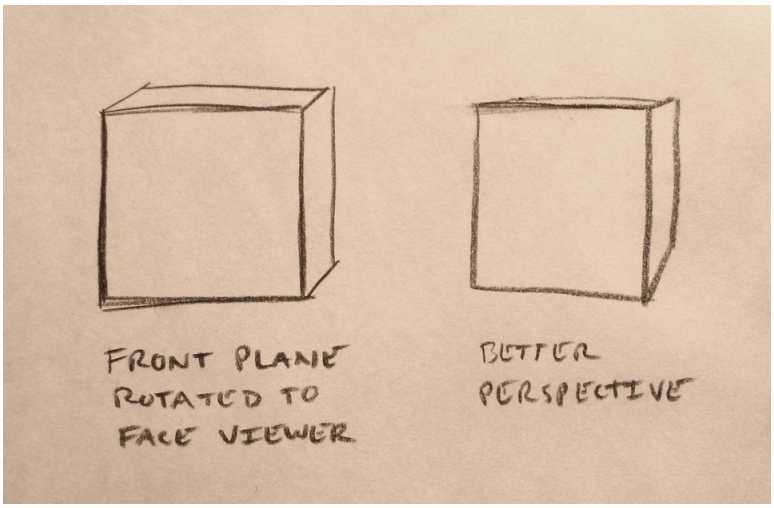


*Figure 45: The drawing on the left is frontalized. A cube will only look like a square when it is facing right at the viewer. Since we can see part of the side of the cube, the facing plane cannot be a square. The drawing on the right illustrates this front face in correct perspective.*

Perspective

Perspective errors are very common. The table-top effect and frontalizing are two examples. Another example of broken perspective is when lines that should converge miss their vanishing points, or when the vanishing points in are too close together (fig. 46). This can happen if you make your decisions about perspective while you are closer to your drawing than it is meant to be viewed. If this happens, when the drawing is viewed from a comfortable distance the drawing

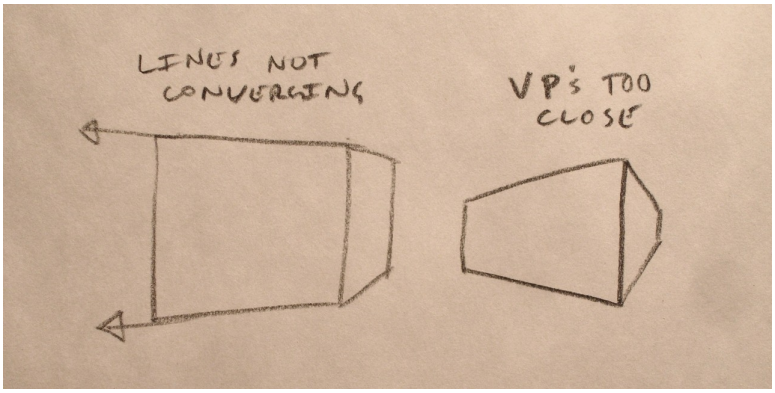


*Figure 46.*

will appear distorted, as if the viewer were seeing the subject from closer than the are to the drawing, like a fish-eye lens effect.

Generalizing

Generalizing is an umbrella term that describes the tendency to simplify things within a drawing. Gradients (smooth changes in value over a distance), a shadow terminator, a complicated contour, a complex curve and a cast shadow shape are some of the things that are most in danger of being generalized. Generally, the more difficult something is to draw, the greater the tendency to generalize the information. Any irregular information in a mass, like hair, feathers, textures, patterns etc. are also very easy to generalize. Remember to always draw specifically. Draw the information that makes the object look like the object.

Stretched Foreshortening

Foreshortening occurs whenever an object is viewed from any angle other than straight on. Since the object is in perspective, as the object turns more and more in line with your vision its apparent length will diminish, until you are looking at the end of the object and can see very little or none of its length. You can observe this effect very easily. First, close one eye. Next, point a finger to one side, so you are looking at its entire length, and then turn it toward yourself until you are pointing right at your eye. You will see that you see less and less of the length, while the width (the tip of your finger) turns directly toward you.

The tendency with foreshortening is to draw more of the length than is actually observed. This is akin to a frontalizing effect. The result is an object that is distorted by showing too much of the side while showing a lot of the width (fig. 47). It can look like the object was smashed out of shape.

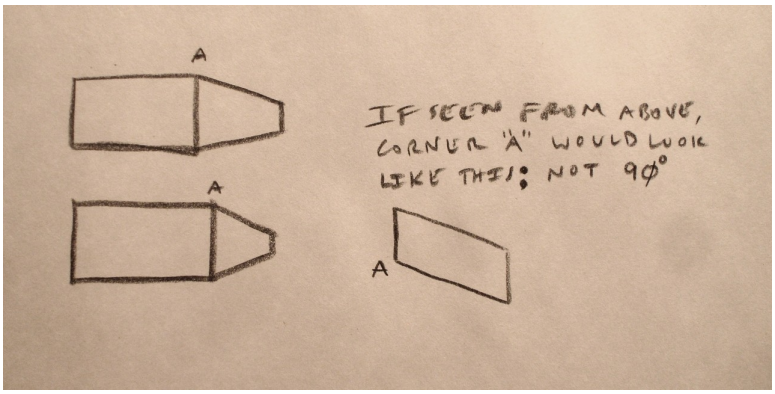


*Figure 47: Both of the drawings on the left are distorted to show more of the length than was actually observed. If the object were seen from the top down its angles would not be ninety degrees.*

The way to avoid this error is first to identify it: either detect it in your drawing or anticipate where it might occur. Then you can use your eye or other measuring tools to mark the optical limits of the object, the points that represent the observed top, bottom, left and right of the object, and place these points on your drawing. If these measured limits are maintained, and the foreshortened object is constructed and drawn within those limits, then it will appear in your drawing as it should.

*Practical Application: Avoiding Tipping, Frontalizing and Foreshortening Errors*

Purpose: To learn how to avoid, and fix when necessary, the most common drawing errors.

Materials: Boxes. Pasta boxes will work well. Find a long one like a spaghetti box, and another rigatoni box (or similar flat box).

Start off with the flatter box laid flat on your still life table. Draw it first without measuring, making all of your marks intuitively.

Then repeat the drawing, checking with your needle how much of the top of the box you see relative to how much of the facing surface you see. Check your angles and try and draw the box as closely as you can without spending more than five or ten minutes on it. Compare your two drawings and check for differences (fig. 48). Repeat this exercise a few times, each time with the box at a different turn. Also, raise and lower the box relative to your eye level to change perspective.

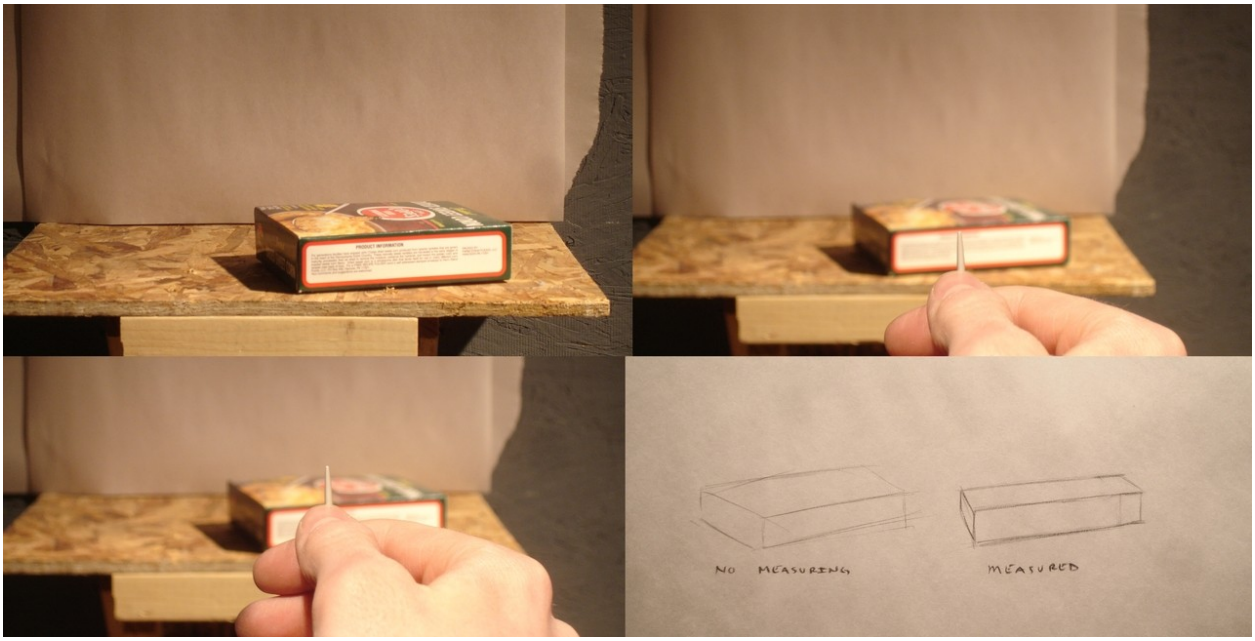


*Figure 48: Note in this example that the first drawing has the box tipped forward (table-top effect) and turned to see more of the left side (frontalized). The second drawing, corrected by measuring, is much more accurate.*

For the next exercise use the spaghetti box (or a similar long box). Set it so it is facing toward you in deep perspective. Again, draw it intuitively first, then draw a measured and corrected version next to that (fig. 49). Check for any stretched foreshortening; even while measuring it is difficult to overcome the natural tendency to draw what we see instead of what we know.

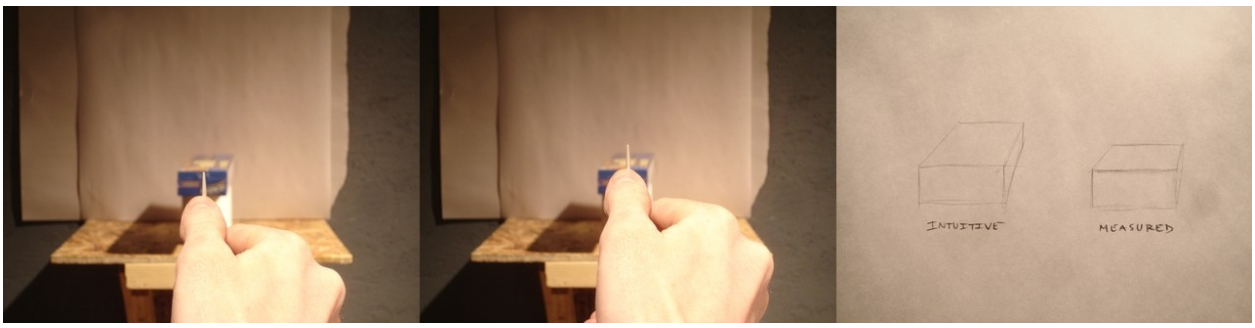


*Figure 49: Notice that in both examples the intuitively drawn box exhibits both a tipping and a stretched foreshortening effect.*

Further Study

Always keep in mind the tendency to distort, tip and rotate objects. Prevent these errors from happening by measuring the most likely candidates for distortion. Always make your best guess first, then check it by measuring. Draw these items optically, that is, draw what you see; this will remove some of the tendency to draw what you know about the item, and result in a more accurate drawing.

*Ellipses*

An ellipse is a circle seen in perspective. It looks like a squashed circle. As with other shapes, when a circle is foreshortened it loses width along one axis while but it retaining its width along the opposite axis. Ellipses are challenging to draw convincingly even without having to relate them to an environment in perspective. Common errors include flattening out the top and bottom curves, pinching the skinnier ends, mis-matching the minor axis of the ellipse with the axis of the cylinder, and drawing the ellipse so that it is not a mirror image of itself (fig. 50).

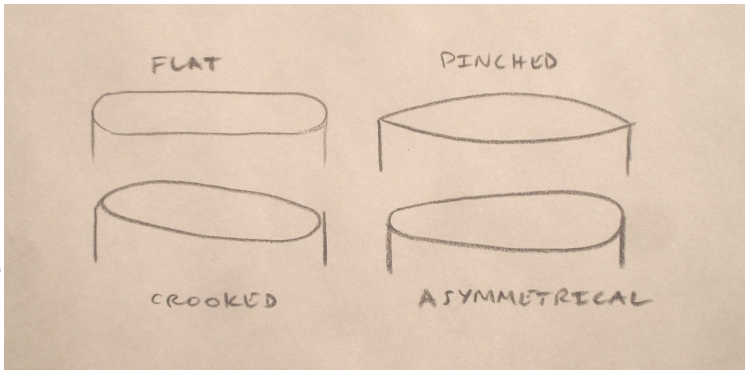


*Figure 50.*

Ellipses have two axes, the minor and the major. These two lines for a cross in the center of the ellipse, sectioning off four quarters that are mirror images of each other. The minor axis is the shorter one, and lies perfectly on the center axis of the ellipse. The major axis is the longer one, and is perpendicular to the minor axis (fig. 51).

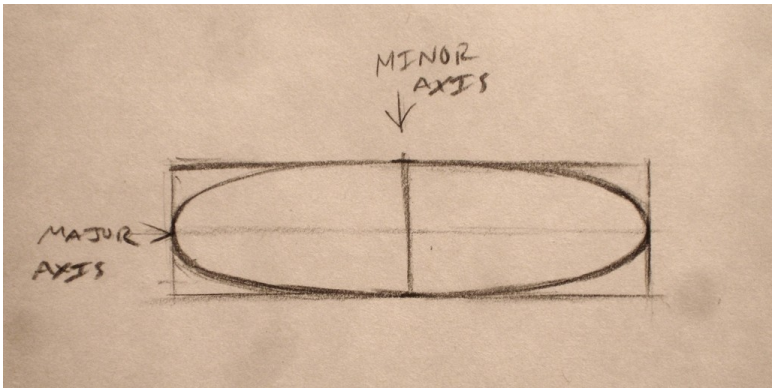


*Figure 51.*

If you draw a rectangle around the ellipse with the same length and width the ellipse will be tangent to the rectangle where the minor and major axes touch (fig. 52). This is helpful for drawing an ellipse. It also means that at the bottom of cylinders, where half of the ellipse is hidden, the curve meets the vertical right at this tangent, making a straight line (fig. 53).

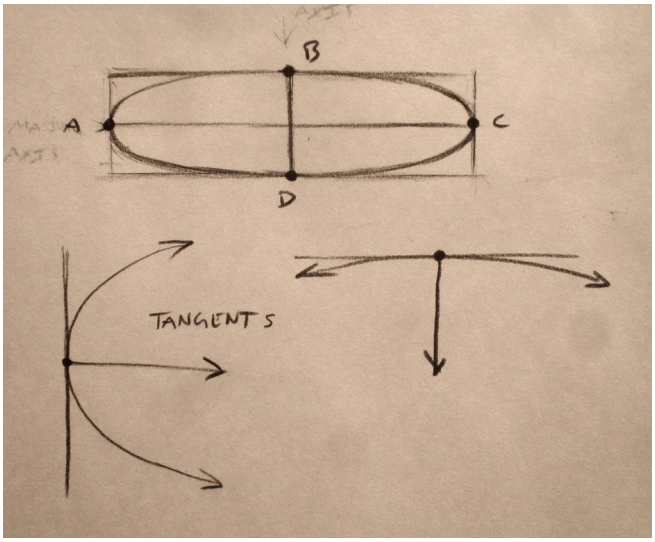


*Figure 52.*

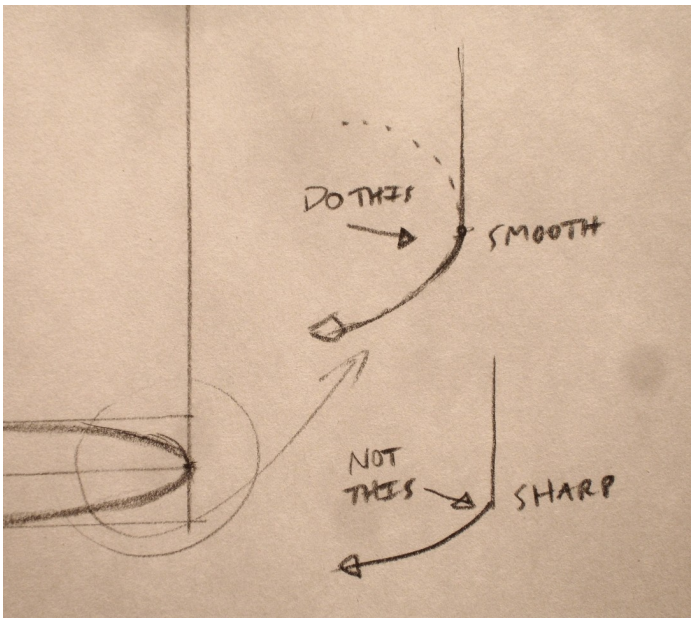


*Figure 53: Since the vertical line meets the ellipse at a tangent point the contour makes a smooth transition.*

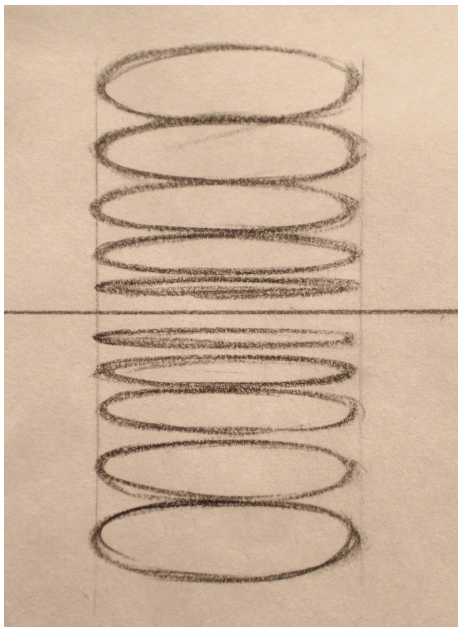

*Figure 54: Notice how the ellipses are skinnier as they approach the horizon, and they get rounder as they get farther away.*

As a general rule, the closer an ellipse is relative to the horizon the flatter it will appear (fig. 54). At the horizon, an ellipse appears like a flat line. As it moves away from the horizon, it is more and more round, approaching a circle. This means that if you are drawing something like a soup can, the top ellipse will have a smaller major axis than the bottom one (half of which is hidden).

*Practical Application: Drawing Ellipses*

Purpose: To learn how to draw convincing ellipses in perspective.

Materials: Cylindrical objects like a roll of tape, can of soup, paint can, etc..

In this first exercise we will only be concerned about drawing the ellipse at the top of the object, not the whole cylinder. Set up a cylindrical object flat on your still life table. Find the height to width proportion using comparative measuring, and draw a rectangle on your paper with the same proportions (fig. 55).

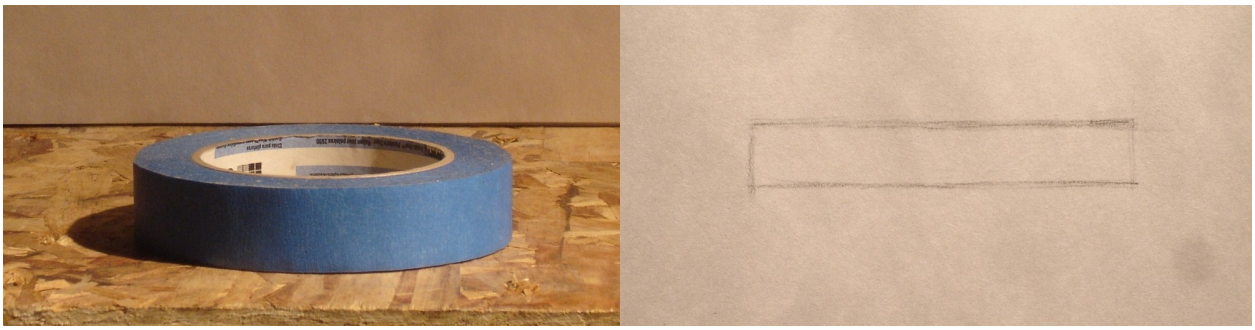

*Figure 55: Only the top ellipse of the roll of tape is drawn for this exercise.*

Next, draw lines through the center of the height and width. These are the major and minor axes. Now, starting where the axes touch the rectangle (the tangent points), draw a curve that swoops out towards its neighbor corner, attempting to follow a good elliptical path as good as you can. Do this for each tangent point, in both directions. By doing this you ensure that the axes of the ellipse are proportional to each other, that the ellipse has the right tilt relative to vertical, and that the tangents are all in the correct places (fig. 56).

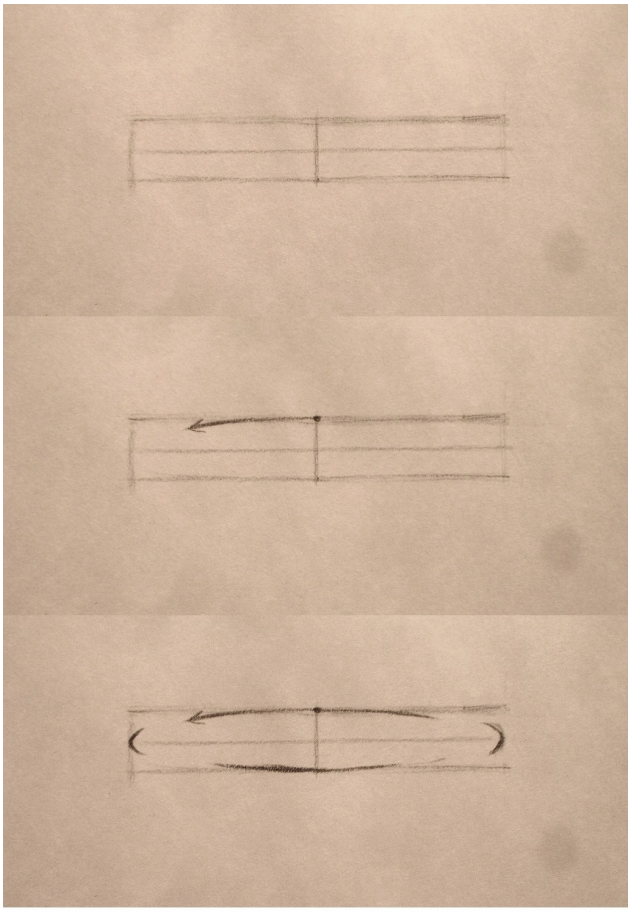

*Figure 56.*

Next, by estimation, fill in the rest of the ellipse. Once the curve is closed you will see areas that do not look quite right. Sometimes it might be hard to figure out what is wrong with the ellipse. If the error is not apparent, compare one side to the other, pick the one that looks better, and adjust the bad half until it is a mirror image of the good half. You can do this by comparing left to right, and also by comparing the top of the ellipse to the bottom. During your

corrections make sure you do not drift away from the tangent points. After your corrections you can erase out the construction lines and clean up the contour of your ellipse (fig. 57).

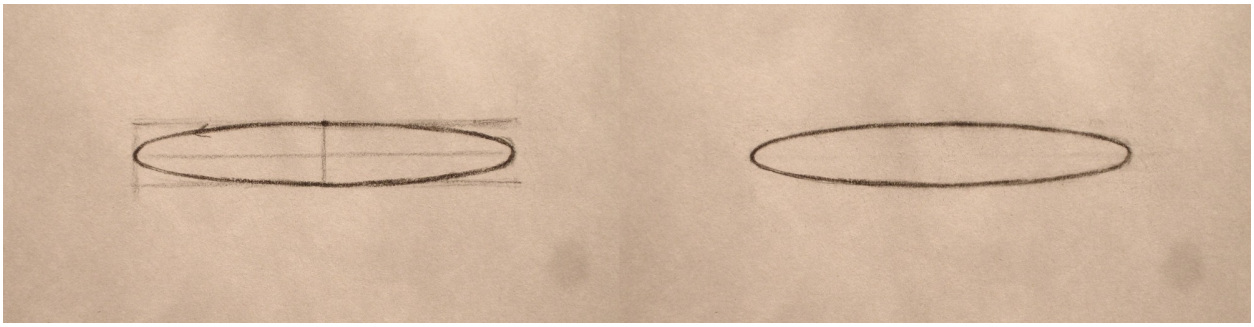

*Figure 57.*

Further Study

Repeat this exercise with ellipses at different eye levels. Always construct ellipses in terms of height, width, and tangent points. This will make them more accurate and give more authority to your drawing. Look for elliptical effects throughout your day. Notice how ellipses closer to the horizon are flatter than those farther away.

Study ellipses in perspective. Ellipses, when in perspective, do not behave like circles. They become distorted. A good example of a distorted ellipse is the cast shadow of a sphere. The sphere projects an elliptical shadow on the flat surface of the table, and then when you observe that table top in perspective the ellipse becomes distorted. Draw these distorted ellipses carefully and specifically; it is easy to generalize them.

*Practical Application: Drawing Cylinders*

Purpose: To learn how to draw convincing cylinders in perspective.

Materials: Cylindrical objects like a roll of tape, can of soup, paint can, etc (fig. 58).


*Figure 58.*

For the next exercise we will add in the rest of the cylinder and the bottom semi-ellipse. Find the height and width of the entire cylinder. Now find the height of the upper ellipse and make the bounding rectangle for it. Next, find the height of the bottom ellipse. This is harder because you must imagine where it is (fig. 59). It will help to remember that it will be slightly taller than the top ellipse, because its circle lies on a plane that is farther away from the horizon. You can also estimate the height of the lower ellipse by finding the tangent points at either side, which are at the center of its height.

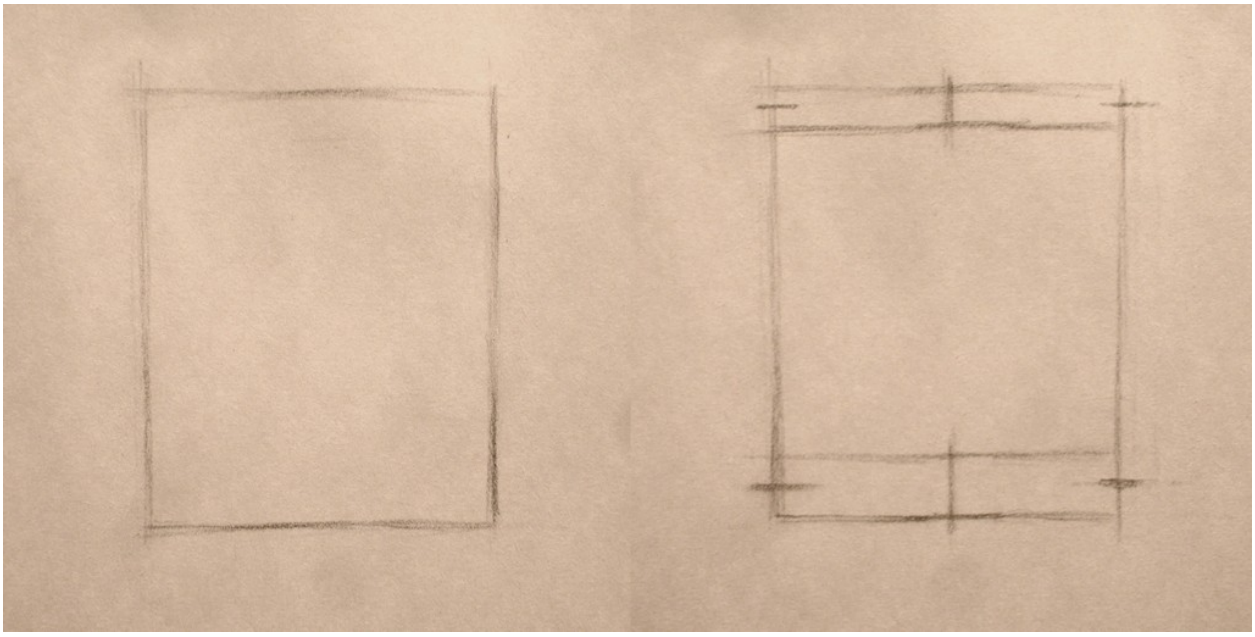

*Figure 59: First establish the overall height to width rectangle, then establish the height of the two ellipses.*

Draw the upper ellipse as in the previous exercise. Draw only the lower half of the lower ellipse, making sure the tangent points at either side make the correct transition to the vertical sides. Clean up your construction lines, and then refine your ellipses (fig. 60).

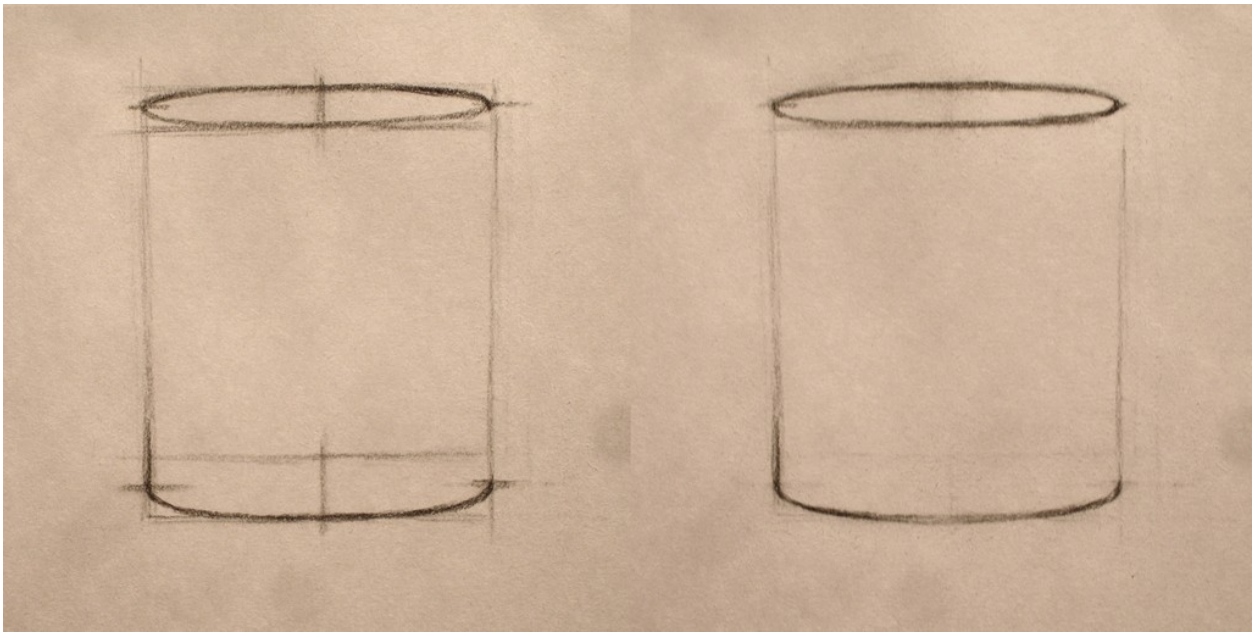

*Figure 60.*

Next, repeat the previous exercise, but this time use a cylinder that is laying on its side (fig. 61).

*Figure 61.*

All of the same principles hold, but everything is rotated to match the axis of the cylinder in perspective (fig. 62). The far ellipse can be drawn in the same manner as the previous exercise.

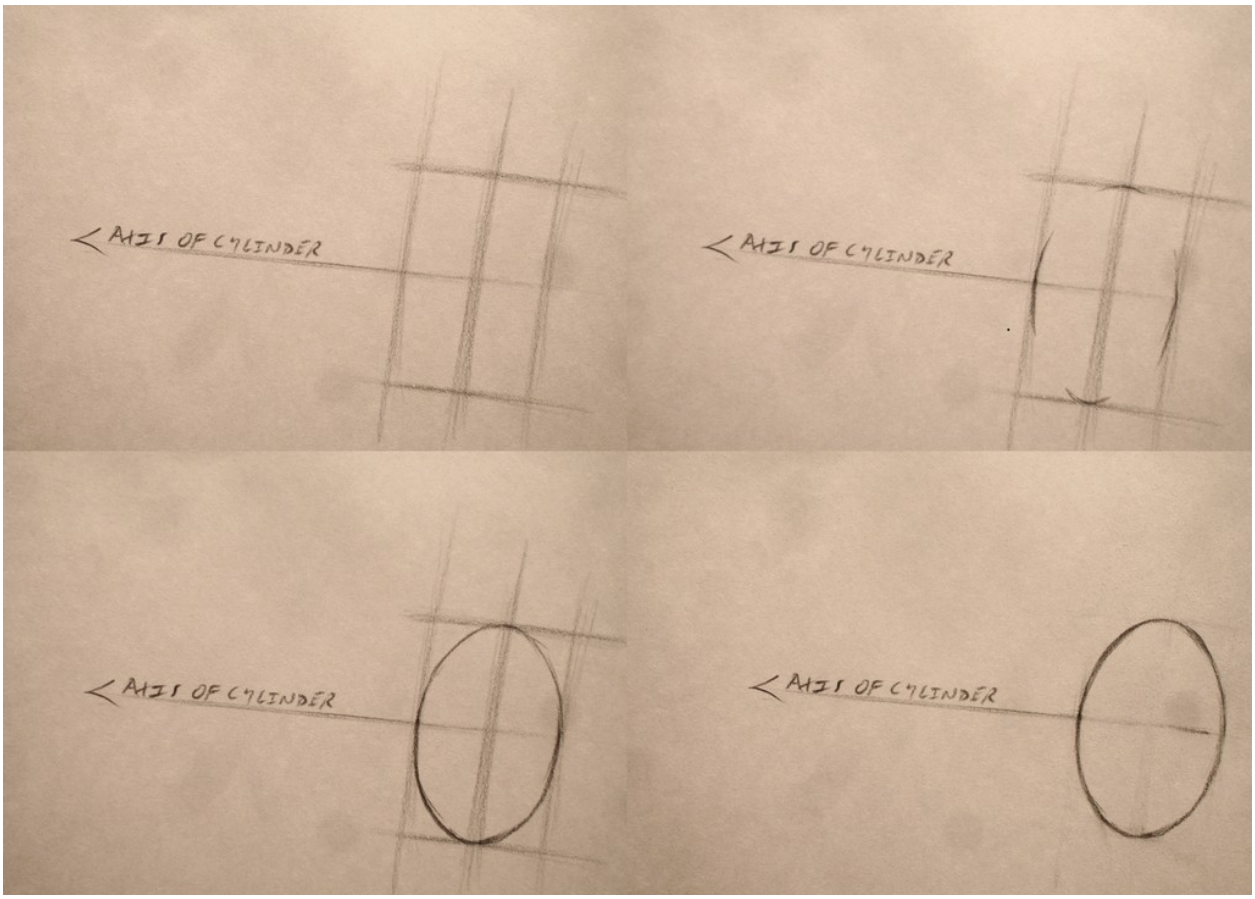


*Figure 62.*

Further Study

If you are looking at a cylinder in perspective it means that one end is farther away from you. Because of perspective, this means that the major axis of the farther ellipse, the one you only see half of, is slightly smaller than that of the closer ellipse. This means that the sides of the cylinder will exhibit a very slight taper as they recede into the distance toward a common vanishing point. Whenever you are drawing a cylinder try to introduce this subtle perspectival effect to enhance the illusion of your drawing.

**Value**

*Value Structure and Perception*

The artist must be able to represent nature from the deepest shadows to a blinding sun within the limited value range of their materials. In paint this is the blackest black paint and the whitest white paint, in graphite or charcoal it is the darkest possible mark to the white of the paper. How do you fit all of the value-information in nature or a still life into that small range?

Value

Local value is the native value of an object. A tennis ball has the same local value whether it is in a very dim room or full sunlight. A black object stays black irrespective of its lighting condition. If it were moved from one lighting condition to another it would still be a black object.

Perceived value is what value you actually see. When light hits a sphere with a white local value, different parts of the sphere receive different amounts of light, so we see different values. These value differences are what our brains interpret as form. If we can reproduce these value relationships in our drawings, we can give this same sense of form to our viewers.

When light hits an object, certain parts of the spectrum are absorbed, and whatever is not absorbed is reflected. This reflected light is what hits our retina; the colors we see are the colors that are not absorbed by the object we are observing. A red object appears red because red light is all that escapes its surface; all the other colors are absorbed. The amount of light and its colors, determine how bright (value) and intense

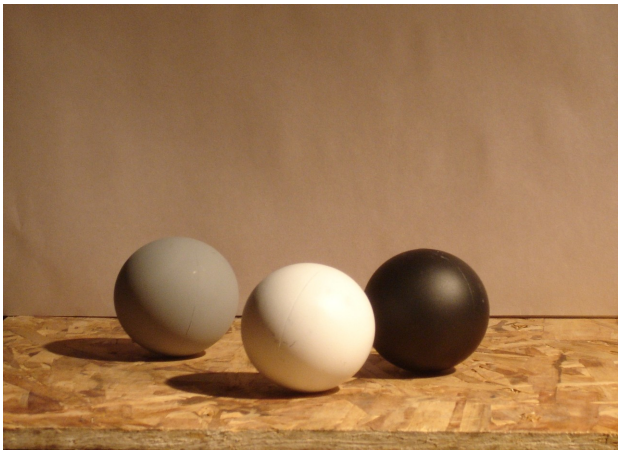

*Figure 63: Here are three spheres: gray, white and black. If the lights were dimmed way down, these objects would still maintain their relationships. The white object would still be perceived as white, even if the perceived value was much lower.*

(fire-engine red vs. brick red) an object appears. An object with a light local value will appear lighter than a darker object irrespective of the lighting condition (fig. 63).

White objects reflect almost all of the light that hits them, while black objects absorb almost all of the light and reflect very little. This is why you will feel hotter wearing a black shirt instead of a white one on a sunny day; the black shirt is absorbing most of the sunlight and radiating it as heat.

Two objects of the same local value will share the same modeling factors while under the same light source. If you took a tennis ball, and a gray sphere of the same local value of the tennis ball, and then took a black and white photograph, they would appear almost identical with respect to their value scales.

Compression and Value Structure

Your eye is a very precise and dynamic sensory organ, and your brain is very good at decoding and interpreting the information it receives from your eyes. Your irises will expand and contract, letting more and less light in, adjusting to the ambient light conditions and what you are looking at. This means that if you are in a brightly lit room, or looking at a bright object, your irises will contract to keep the amount of light in your eye from overloading it. If you are in a dark room, or are looking at something dark your irises will tend to expand to let more light information in.

That said, your eyes can trick you. In fact, your eyes and brain continually make guesses, and attempt to give you the most important information they can, even when some of it is inferred. Your brain fills in the blanks, omits unimportant information, and highlights important information. This is how a movie, which is just a series of discrete images, appears to be a moving picture; your eyes and brain act to fill-in the blanks.

This has some pretty important implications when it comes to translating the 3D visible world into a 2D image. An eye can be compared to a camera. Photography faces some of the same limitations that artists do: how does a camera express all of the values in nature within the constraints of pigment-black and pigment-white? Cameras accomplish this by compressing values, and in some cases chopping off entire chunks of value in what it is recording.

If a camera is outside on a sunny day it is unable to see detail in the very lightest areas at the same time as detail in the more shadowy areas. If the iris was expanded enough to gather enough light coming from the shadows it would also be allowing in too much light from the bright areas. This would over-expose the film in the light areas, sacrificing detail there for increased detail in the darks. If a cameras iris were constricted enough so it could discern detail in the lights, the aperture would be too small to gather enough light to see the information in the darks. If the scene being photographed presents more of a value range than a camera can handle, the settings of the camera will determine what gets sacrificed (fig. 64).

*Figure 64: The picture on the left simulates a dilated pupil: one that is opened up to see more detail in the darks. Notice how the lights get washed out and lose information. The picture on the right simulates the view through a constricted pupil. Notice how there is more information in the lights, but the darks look muddy and abbreviated.*

In a drawing, you can finely tune your use of value to incorporate as much or as little information as you want. This is one of the ways that working from life is better than working

from photographs; if you work from a photograph some very important choices have already been made for you by the limitations of the camera.

Your eyes are constantly adjusting without you really noticing it. If you are drawing a scene in your room, and you are looking into the lights, your eyes will tend to constrict, showing you a broader range of detail in the lights at the expense of the darks. If you are looking into the darks your irises will tend to expand, broadening the value range in the darks at the expense of the lights. If you draw everything as you see it, those two value scales might overlap too much! This will produce a drawing with shadows values that overlap far too much into the light values, and this can destroy the illusion or believability of your drawing.

The solution is maintaining a value structure throughout your drawing. This is a method for keeping all of the values in your drawing in their proper order in relation to nature: if the apple is brighter than the cloth in your still life setup it will be brighter than the cloth in your drawing. This is a very powerful and subtle tool; it can extend the range of your drawing far beyond what a camera can capture, showing both detail in the lights and detail in the darks all while keeping everything in its proper place.

Broken Value Structure

Broken value structure means that the values of a drawing are not working, for one reason or another. The most common situation is that the overall plan of light and dark has been lost along the way, likely by modeling the halftones too darkly and bringing reflected lights up too high. A drawing in this state does not present your viewer with the information they need to perceive lit forms.

You can avoid this situation at the outset by planning your values, consciously allocating values for your light and darks, and maintaining the separation of light and dark throughout your drawing.

To fix a drawing suffering from a broken value structure, restate the lights and darks. Bring the darks closer together in value so that they take up less of the value scale, and do the same for the lights, ensuring that there is a clear separation between areas receiving direct light and areas that in shadow. You can even go as far as to return the drawing to a notan, a drawing with only two values and no modeling at all. After the darks and lights are unified, you should make sure that the values in the lights are in the right order, that is, the hierarchy is intact. Do the same for the darks and your drawing should be in much better shape than before.

*Practical Application: Value Structure Drawing of Single Sphere*

Purpose: To show how a simple value structure can give the illusion of form, and the impression of different local values.

Materials: Light-colored sphere.

A surprisingly convincing illusion of form can be achieved with a strong value structure and very simple shading. Set up a white sphere, below eye level, lit by a single strong source so that it casts an easily discernible shadow. Using a line of even weight, draw the outline of the sphere, then draw the outline of the form shadow shape of the sphere. After that, draw the shape of the cast shadow on the table's surface. Notice how the cast shadow is projected from the form shadow (fig. 65).

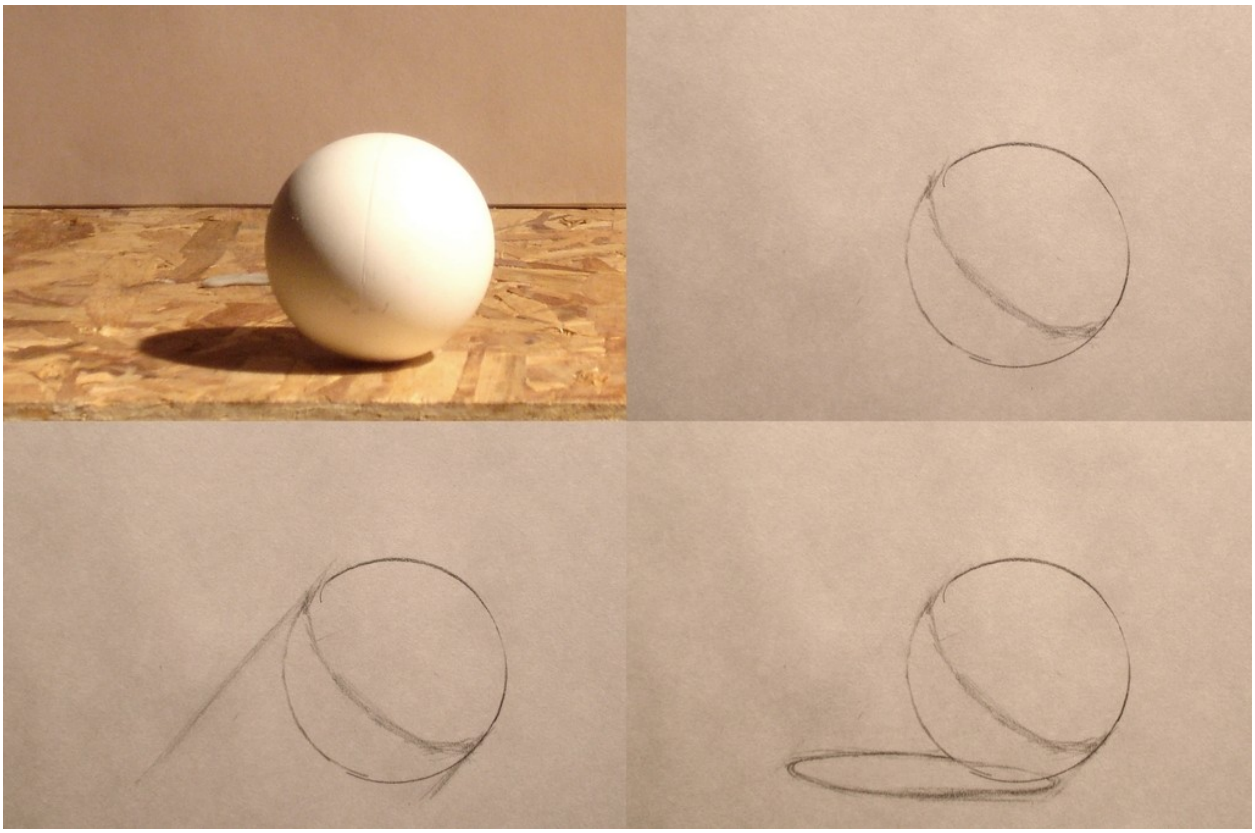

*Figure 65: Draw the shape of the terminator and cast shadow. Notice how the terminator shows where the light is coming from: above, to the right and slightly in front of the ball. The cast shadow is a projection of the object onto the surface.*

Squint down to simplify shapes, ignore any reflected lights, and observe how the cast shadow will blend with the form shadow into one shape. Check your shadow shapes against what you see while squinting. Avoid symbols; you may find yourself making the cast shadow shape wider from top to bottom than it appears, and this is your mind tilting the tabletop up toward you.

After your sphere and shadow shapes are satisfactory, shade the shadow shapes in, together, with an even value throughout both.

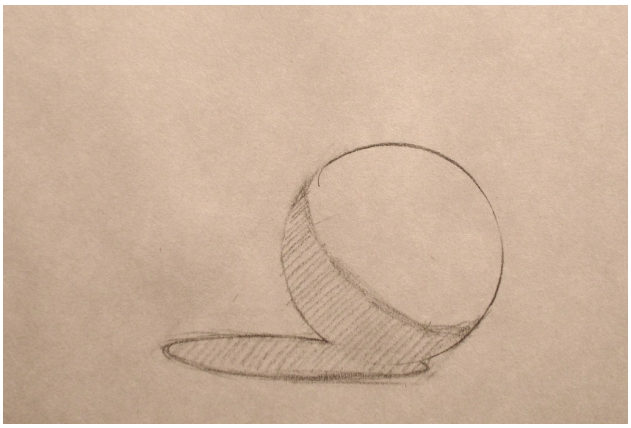

*Figure 66: This simple, two value drawing is already conveying a sense of light.*

Leave the lit area as blank paper, and disregard all information in the shadow areas (like reflected light) while you are shading them in (fig. 66).

Note how strong the illusion is already. Your brain sees your drawing and applies its sense of three-dimensionality to something it recognizes: a ball on a table casting a shadow. We will try to use this type of perceptual trick to our advantage throughout this course, while avoiding perceptual pitfalls discussed in previous lectures.

Now, make the terminator (the slightly darker band in-between the main light and main shadow areas) and the entire cast shadow area just a touch darker than the shadow value. Note how using very little of the value scale you are still able to achieve the same strong illusion of three-dimensionality (fig. 67).

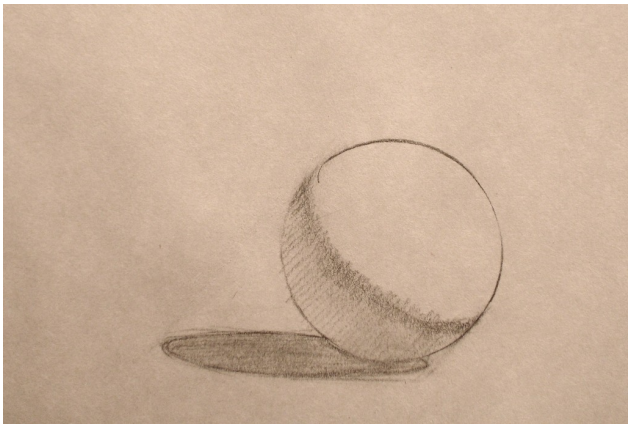

*Figure 67: The same drawing, but with a slightly darkened terminator and cast shadow. Notice how the previous, lighter wash of value in the shadow on the sphere reads as reflected light.*

Next, fill in the shadow with a darker value than before. Note how the illusion is still intact, but it looks like the sphere is lit by a stronger light source. This is because your drawing now has more of a separation between light areas and dark areas, just like a setup would have in life if it were lit by a strong source (fig, 68). This is one way that you can control the lighting condition that your viewer perceives. Objects with a very large difference between light and dark appear more strongly lit.

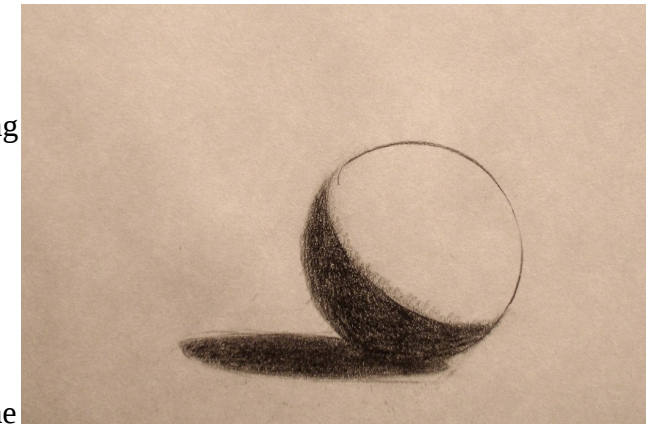

*Figure 68: A sphere with a dark uniform value in the cast and form shadows.*

Take this third drawing, the one with the dark value throughout the shadow, and lightly

shade the lit area of your sphere, all one value, about a medium gray. You can choose any value you wish, but it should be darker than the paper and lighter than the shadow value. Note how this arrangement of value makes the blank paper, representing the tabletop, appear as if its local value is brighter than the sphere. Make the lit side of your sphere a little darker, and see how the sphere looks darker overall and the tabletop looks brighter by contrast (fig. 69).

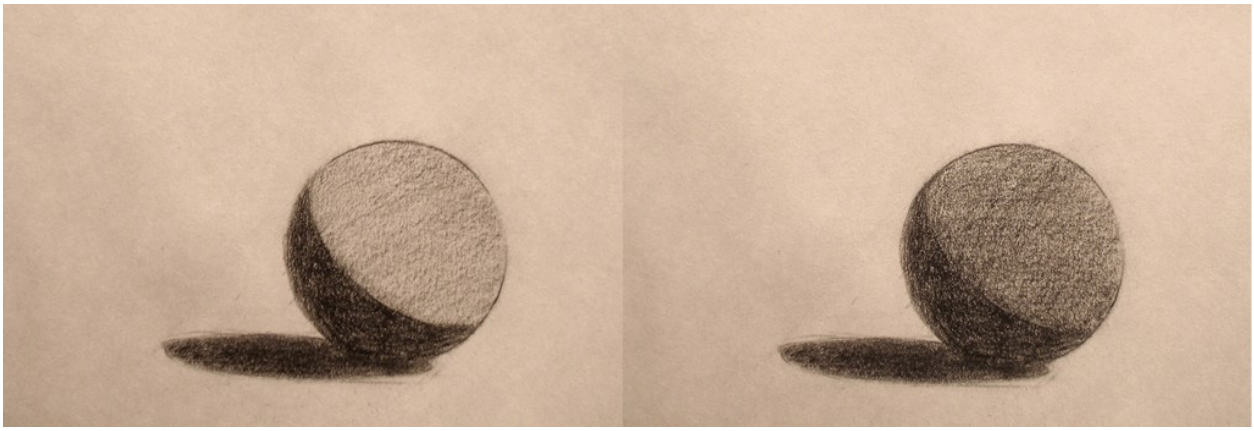

*Figure 69: The same sphere as the last picture, but now the lit side has been made darker, and then even more dark in the second picture. Notice how this makes the sphere look like a darker and darker local value. This is because the separation between the lit side of the sphere and the shadow side is shrinking. The difference between the sphere and the table top is growing, however, making the table top appear brighter.*

Now shade in the white of the paper to the same value as the lit side of the sphere. Note how they both now appear the same local value in your drawing, and it looks like someone turned down the lights in your drawing (fig. 70).

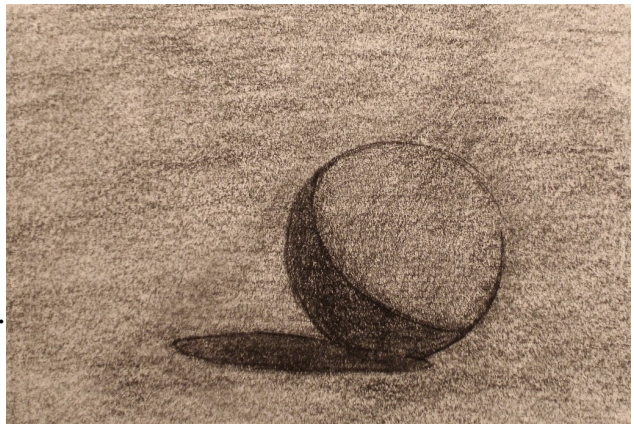

*Figure 70: The overall value range of the picture is restricted to darker values. Note how this gives the impression of a dimly lit area.*

Further Study

Repeat this exercise several times, with different value spheres and other geometrical solids like cubes and cones. When you are planning your values, have a certain impression in mind that you wish to communicate to the viewer. Do you want them to perceive a dark-colored

sphere on a white background? Do you want them to perceive a softly lit, light-colored sphere? Try out different combinations of values until you achieve the effect you are after.

*Relating Objects to Each Other*

The previous class discussed how artists are limited in the way we can represent value within the constraints of our materials. The exercise from the last unit showed that a conscious manipulation of value in a drawing can create a convincing representation of light on form with very little actual drawing. This exercise will increase the number of objects, and examine how to represent objects of different local values within a single environment.

A white sphere and a black sphere, placed next to each other and illuminated from a common light source, will look like white and black spheres. This may appear self-evident, but it is important to know why this is so in order to capture that same effect in a drawings.

If you were to place the value structures of these two spheres side-by-side they would look very different. The scale for the white sphere would be longer, encompassing more values, and the lightest value would be very high, while the darkest value would be somewhere in the middle. The black sphere, on the other hand, would have a smaller value scale, with darker values overall (fig. 71). Depending on the surface qualities of the spheres, the value scales might not overlap at all, that is, it is possible for the lightest light on the black sphere to be darker than the darkest dark on the white sphere (with a possible exception for the accent). If one were to draw these spheres using

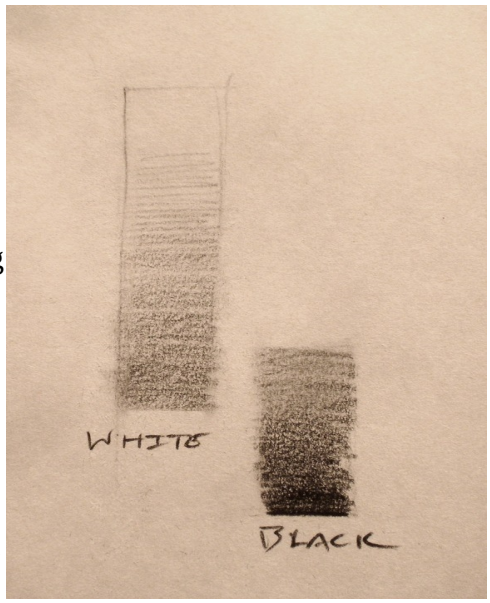


*Figure 71: The value scale for the white object is larger and encompasses more of the value scale. The black scale is smaller and has darker values.*

value scales that overlapped to a degree not present in life, the drawing would not create the illusion of a white and black sphere.

This is what is meant by a value structure. A value structure is a set of value scales that represent certain local values under certain lighting conditions, all of which relate to each other convincingly. The artist can change a value scale considerably and still maintain the illusion of local values in an environment, provided they maintain the relationships between the scales for different local values.

*Practical Application: Value Structure Drawing of Two Spheres*

Purpose: Learn how to relate objects of different values to one another within a drawing and maintain the illusion of light vs. dark.

Materials: Spheres of different values. They do not have to be gray, white or black, but the closer they are to neutral the better. This is to prevent intense colors from being confused as lighter values.

Place two spheres of different values on a sheet of paper, and illuminate the arrangement with a single main light source. The light should be clearly readable as coming form one direction, and casting a single shadow for each object (fig. 72).

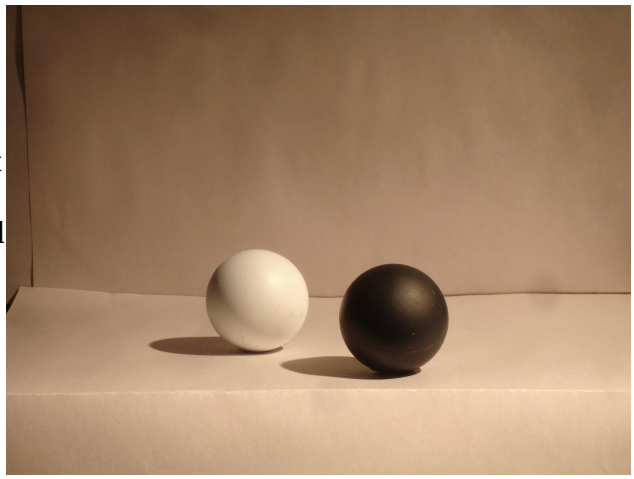

*Figure 72.*

On your sheet of paper, off to one side, draw a value scale. This scale can be incremental, with discrete values from light to dark, or a continuous band of value that evenly goes from the white of the paper to the darkest

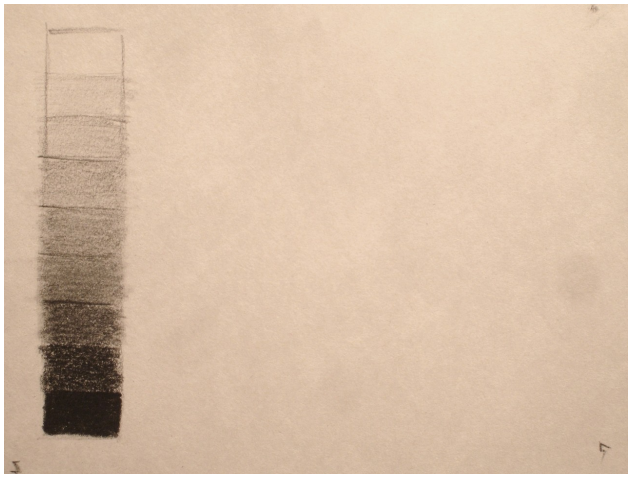

*Figure 73: A nine value incremental scale.*

mark of charcoal. If you use the incremental scale ensure that the changes on your values are even from one to the next, and use around 9 values (fig. 73). If you use the incremental scale, ensure that the progression from light to dark is as even as you can make it.

Lightly draw the objects, the outlines of their cast shadows, and their terminators on your paper, about life-size. Draw these things very lightly, use a pencil if necessary to keep things from getting too dark or messy (fig. 74).

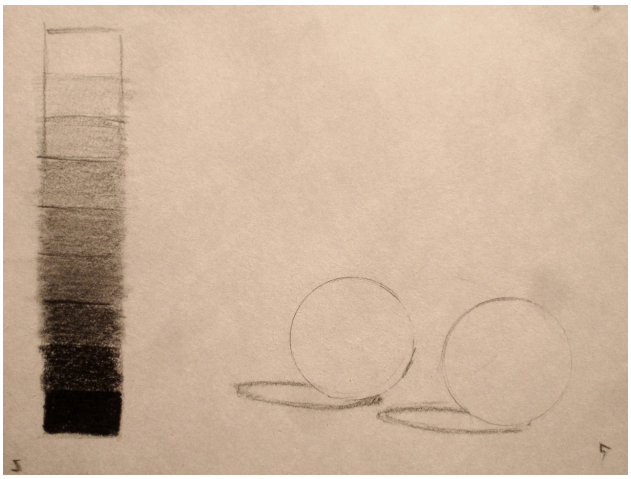

*Figure 74: Lightly drawn silhouettes of the spheres and their shadows.*

Observe the still life. What is the lightest light you see? Indicate on your value scale with a notation what value you wish to use to represent the lightest light. This can be whatever value you want, but for the purposes of this exercise choose a light value. You can draw the lightest light of a white sphere as a middle gray and still have it look like a white sphere, as long as all of the other values in the drawing relate correctly to that middle gray!

Repeat this procedure for the darkest dark (this will usually be the accent), indicating where on your value scale you wish the darkest dark to go, darker than what you indicated for the lightest light. Again, the choice is up to you. There is no right or wrong value, only right or wrong relationships between values. Keep in mind that all of the values of your drawing must fit in-between the two values you choose, so try not to make things too difficult for yourself during this exercise and choose some fairly light and dark values.

The values you pick can certainly be those of the white paper and the darkest charcoal mark, but this should be a conscious choice! Planning the values of your drawing is one of the most potent tools you have as an artist, and to leave this to chance is not an ideal strategy. If you

leave it to chance, the limitations of your materials can come back to bite you. You might not have enough light value left in reserve for a highlight, or enough dark value left unused for an accent or shadow value.

After you have bracketed the lightest light and darkest dark, begin plotting other values. Some values you should plot are: the average light and shadow values on the light sphere, the average light and shadow values for the darker sphere, and the value of the paper surface (fig. 75). Again, these are subjective, but you start to get constrained by your choices, as each value you choose must relate to the others on your value scale as it does in life; for example, if the light value for the dark sphere is the same as the shadow value for the lighter sphere they should be the same on your value scale.

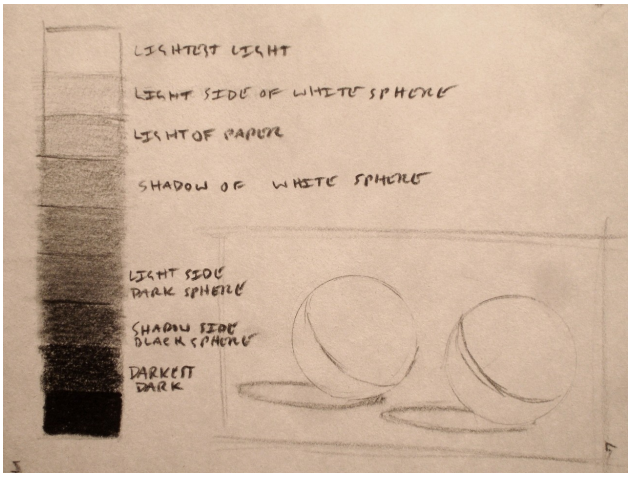


*Figure 75: Scale and spheres with most of the values plotted out on the scale.*

When these choices have been made, and all of the major relationships check out, fill in the areas of your drawing with the corresponding values you picked from your value scale (fig. 76). The result should be a drawing with a value structure that relates convincingly to the value structure of the still life setup.

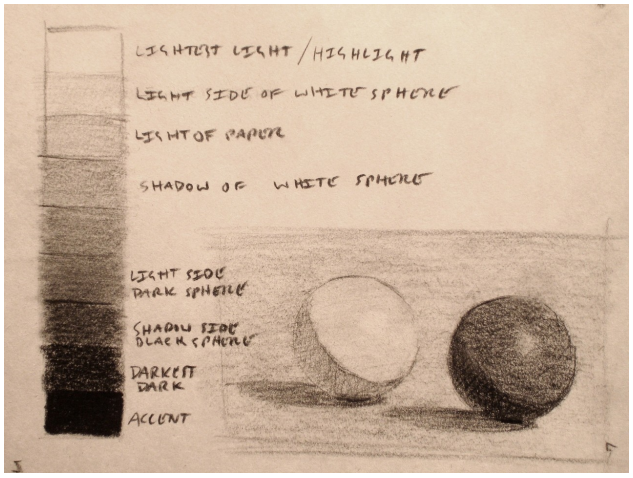


*Figure 76: The completed study. The plotted values have been filled in, and since they were plotted in the same order that they appear in nature the result is a convincing representation of a light and dark sphere.*

The point of this exercise is to gain facility in planning values in a drawing, not necessarily to produce finished drawings. Leave your drawings as flat patches of value, and do not attempt to refine them or model the forms any further. You will get much more out of this exercise if you repeat it over and over, instead of bringing a single drawing to a high level of finish.

This method is very strong, because you end up with a solid arrangement of values that you can use to find the smaller gradations in your setup. If you know that a certain value in your drawing is between two values that you planned with your value scale, you can pick that value with confidence and it will fit into your drawing without having to chase it around.

Further Study

Try this exercise with three or more spheres. If you repeat it enough times you will start to get a sense of what values are the most useful to plot, and which ones can be safely inferred later on in the drawing.

## Modeling Factors and the Behavior of Light

*The Modeling Factors*

As light strikes a curving 3-D form, certain areas receive and reflect more light than others. This seems intuitive, but it is important to understand just what is happening here in order to model our drawings with authority.

Spheres are the best objects to draw for a general understanding of form, as we see an entire hemisphere at a time, representative of every possible visible facet on any other convex shape. To think about it another way, every point on most objects is analogous to a point on a sphere that presents the same aspect to the light source (fig. 77). The imaginary sphere has to have the same local value and texture (matte, gloss, etc). Exceptions to this occur in concavities, of which there are none on a sphere.

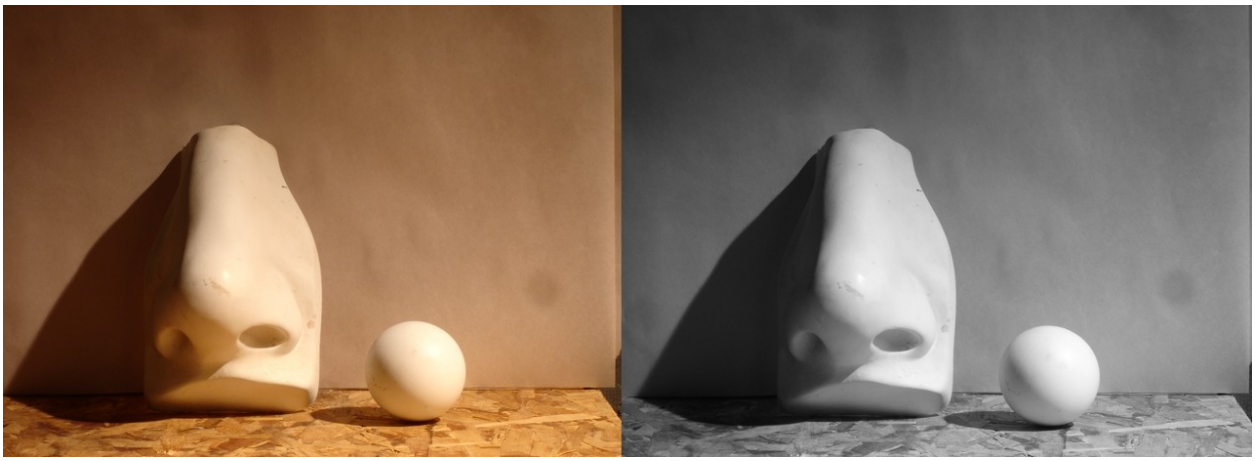

*Figure 77: This is a picture of a white plaster cast and a white sphere, photographed in color and black and white. Notice how for every place on the nose that light is directly striking there is a point on the sphere that the light is striking at the same angle, giving the same value.*

This means that you can draw a sphere that has the same value as your subject, and use it as a map for picking values. For example, if you were to draw the nose cast above, you could draw the sphere next to it first, and then relate tangent planes on the nose with tangent planes on the sphere. Wherever you wanted to put a value on the nose, you could refer to the sphere and find a parallel plane and use that value.

The Terminator

When light strikes a curved object, like a sphere, it lights up only the side that is facing the light. The areas that face more towards the light receive more light and appear lighter. Areas that are closer to the shadow are more turned away from the light, and they receive less light and appear dimmer. The form shadow is the area on the form that receives no direct light, and the cast shadow receives no direct light because the lighted side of the form is blocking it (fig. 78). Reflected light is the form-revealing light within shadows that results from indirect sources of light, like the tabletop bouncing light up into the shadow side of a sphere.

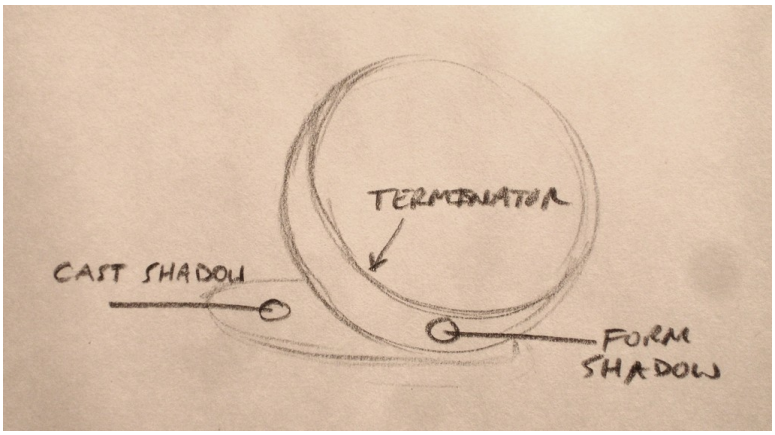


*Figure 78.*

In-between the lit side and the shadow side there is an area that is darker than the lit side and most of the shadow side. This area is called the terminator (among other things). It is darker than the light because it receives no direct light; it is just past parallel from the light source. If the terminator were to turn just a bit toward the light it would become a halftone. The terminator is darker than most of the shadow because it also receives very little reflected light when compared to the rest of the shadow. This is because it is close to parallel with most of the rays of reflected light, which tends to bounce back toward the light source itself (fig. 79).

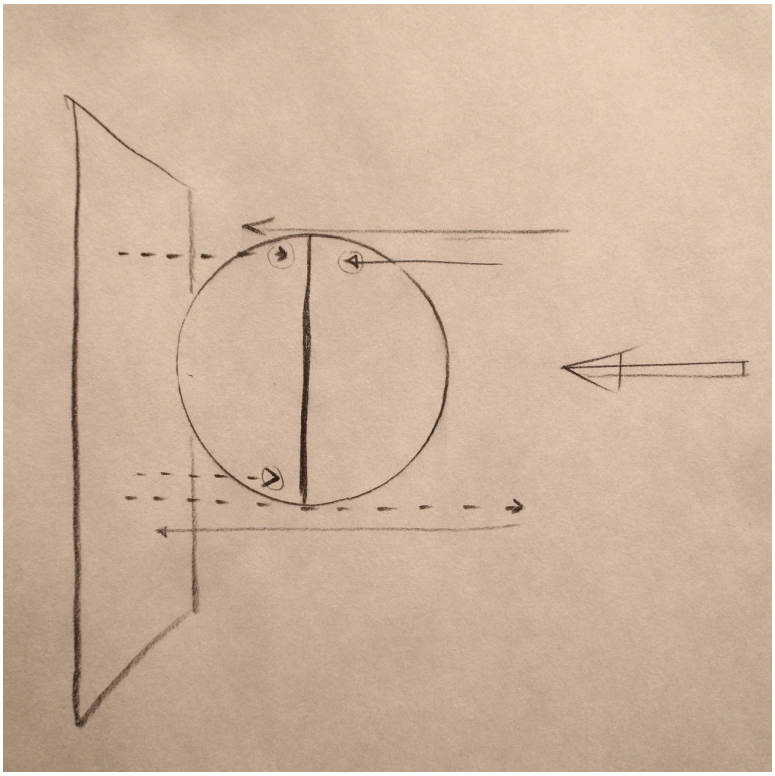

*Figure 79: The big arrow represents the direction of light. The smaller, solid line arrows represent direct light. The dotted line arrows are reflected light. Notice how the terminator, the darker line down the center of the sphere, is just missed by both the direct light and the reflected light.*

The Halftones and Lights

The halftones can be conceived of as those areas that are approaching parallel to the light source. These areas lie just before the terminator and are just as effective in conveying the character and rate of curvature of the form. This falloff accelerates close to the terminator. Since the changes in illumination occur more rapidly in the halftones, modulations in the halftones are very descriptive of the texture and shape of the form that they lie on.

As light strikes an object that is turning away some areas receive more direct light than others. The areas that are facing directly toward the light source are receiving the most light. As an object turns away it receives less light, because the same amount of light must illuminate a larger area than before; the beam is stretched or smeared out over the larger surface (fig. 80). As the turn gets closer to parallel to the light (the point at which the form receives the least amount of light) the drop-off of illumination accelerates. This means that the differences in the amount of light forms receive in the most lit areas will be much more subtle than the differences between forms close to the terminator (fig. 81).

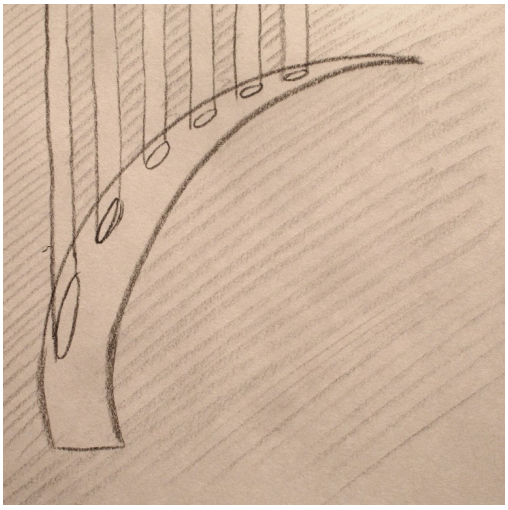

*Figure 80: As a form turns away from the light, equal amounts of light will be stretched out over a larger area, so these areas will appear dimmer.*

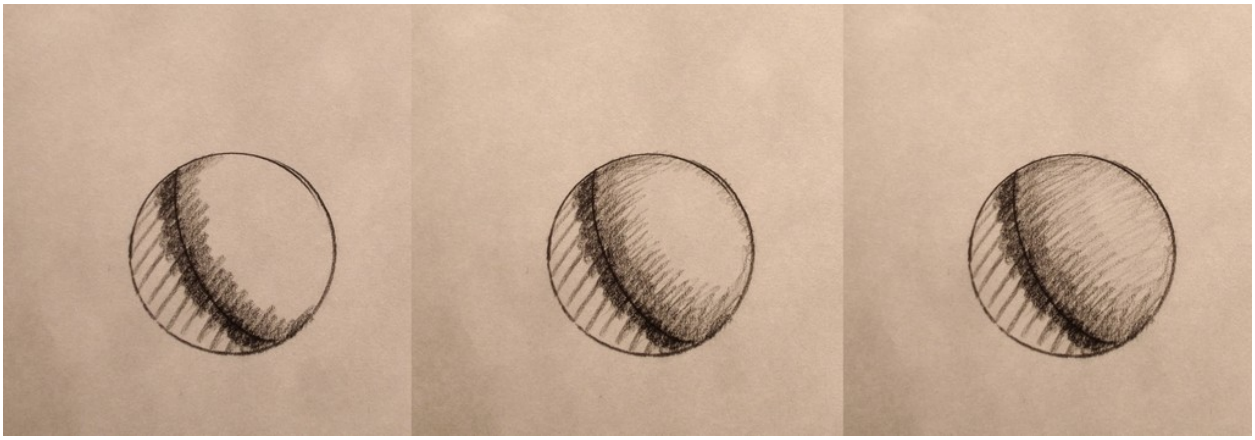

*Figure 81: Observe how the light areas of the sphere are all fairly close in value until they approach the terminator, at which point they accelerate toward darkness.*

Highlights

There are two kinds of highlights that 2-D artists should be aware of: form and specular. The form highlight is the area that is at exactly ninety degrees facing the light: no other angle would be able to receive more light than the highlight. The other type, specular (mirror-like), is

a direct reflection from the source of the light to your eye. This is usually the brightest area of a drawing. The specular highlight will move as you move your observation point. This is because the light must strike a different part of the form in order to reflect directly to your eye (fig. 82). The form highlight and the specular highlight can never be in the same exact position; for that to be true you would have to be illuminating the subject with a light source from within your eye.

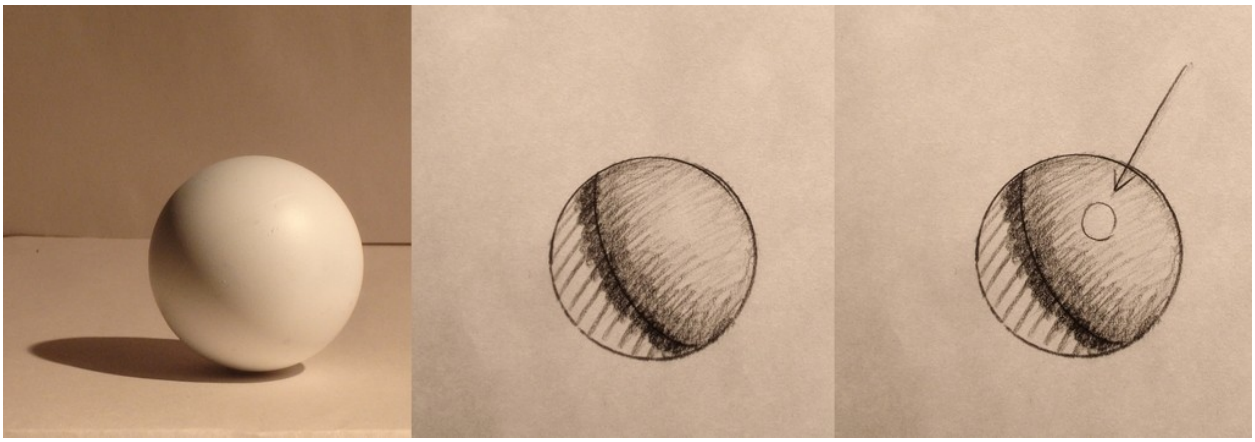

*Figure 82: A reference sphere, a drawing with the specular highlight, then that same drawing with the specular highlight circled. If the sphere was a disco-ball, with hundreds of mirrored facets, the specular highlight would show up in the little mirror that directly reflects the light source to your eye. If you were to move around the sphere, the specular highlight would change position to a different mirror.*

Highlights are often abused in drawings. There are a few things that can go wrong. First, you may run out of room in your value scale; you might model your forms and then find out that you cannot get them to look light enough, unless you use the white of the paper, and then there is not a lighter value left for your highlight. If you encounter this problem you might have to darken substantial portions of your drawing in order to get the highlight to show. There are a few strategies for combating this problem. A value structure with built in room at the top for highlights will work perfectly. Another strategy is working on paper that is darker than white, and using a white chalk for your highlights.

Another problem is the overuse of specular highlights. This can occur in a drawing with many shiny objects or multiple light sources. The result is often garish; if every one of your

highlights is screaming for attention, then none of them will be heard very clearly. A solution to this is to plan a hierarchy of your highlights; which ones are the brightest? Which ones are on objects nearer the focal point of the drawing? Would any highlights be distracting? Figure these things out and then use them in the planning and execution of your drawing.

Concavities

Concavities are areas that curve in, as opposed to convexities, which curve out. The side of a spoon that holds the soup is concave and the other side is convex. Concave areas on a form behave a little differently than normal convex forms. A concave form can be fully in the light, partially in shadow, or fully in shadow. In almost all cases, one part of the concave form is bouncing light onto another part (fig. 83).

*Figure 83: Observe the area between the foot and the plaster surface it is resting on. Notice how the foot is casting a shadow over this recess, but there is also much reflected light present. Also note how much of the reflected light on the rest of the cast has taken on the hue of the plywood surface. This is because the light coming back up from that surface has taken up its color.*

The apparent chroma of an object will tend to increase in the concavities. This is because the new light that the object is reflecting onto itself has already had some of the spectrum absorbed, and the only light that is escaping has been 'washed' over and over by the absorbing surfaces of the convexity, leaving more pure color.

Modeling in the Shadows

Modeling in the shadows can be tricky for a few reasons. First, as you look into shadows to find information to put into your drawing your iris will expand to allow more light in, making areas that appeared very dark when observed within the context of the entire subject appear much lighter when observed alone.

Accents

An accent is like a highlight, only for darks. It is a term used to talk about the darkest areas of a drawing or painting. Like specular (mirror-like) highlights, they can be overused making the picture look spotty. When used well, they increase the overall contrast of an image by expanding the value range, so that lighter objects look brighter and darker ones appear darker.

Accents can occur anywhere, but are usually found in the shadow side or underneath an object. They may be found on the darkest local-value object in a setup, like an eight-ball on a pool table. They may be found in the pupils of a portrait, or the crease in the armpit area, etc. They are most often employed underneath a curving form to indicate where that form is resting on a surface.

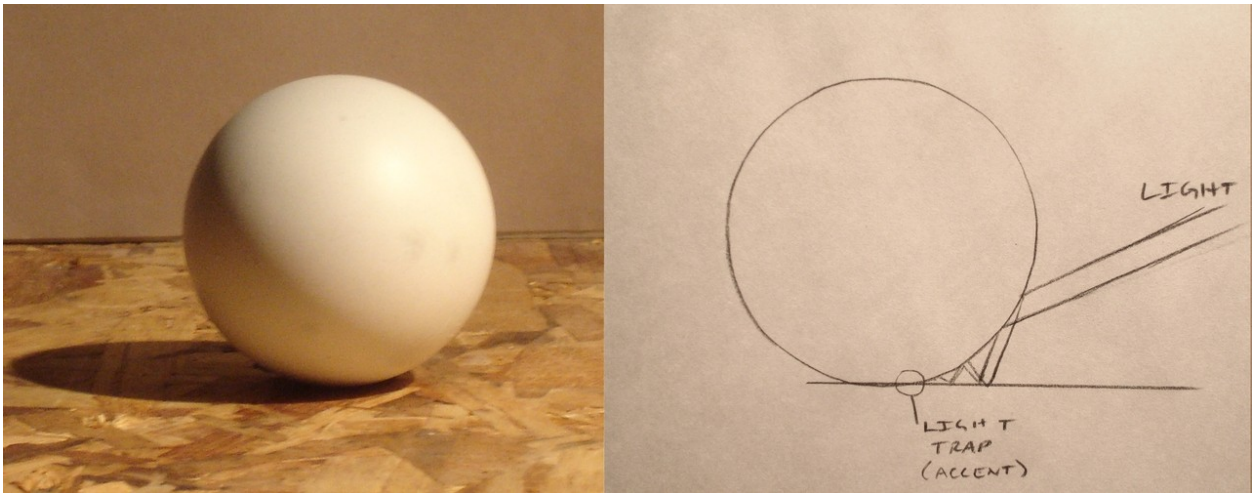


*Figure 84: Notice how the darkest area in the picture of the white sphere is the area beneath it. This is a light trap.*

These concavities are usually where one form meets another. Much of the time, the darkest part of a form is the underside, like where a sphere meets a table. These areas are the darkest because it is very difficult for light to penetrate a deep recess like the one formed under the sphere. Unless the light is shined directly into the space, all of the light within the recess will

be reflected light. In order to reach deeper into the recess the light must be reflected over and over, each time getting weaker due to absorption by both opposing surfaces. This is sometimes called a light trap, because whatever light gets in cannot escape (fig. 84).

*Reflected Light and Other Shadow Elements*

There are a few additional subtle things that happen in shadows that should be noted. The middle picture below shows the drawing without these refinements, and the last picture includes them.

In the picture below, arrow 'A' shows reflected light from the background. This is a subtle effect, and can be overlooked when modeling the shadows because the reflected light from the table top is so much stronger. Arrow 'B' shows an absence of reflected light, because that part of the sphere is now turning toward the cast shadow and there is not much light reflecting out of the cast shadow. Arrow 'C' shows how the cast shadow on the table surface is darker right underneath the sphere. The cast shadow is receiving reflected light from the background as well, like the sphere at 'A,' but at 'C' the sphere is blocking the cast shadow from getting any reflected light (fig. 85).

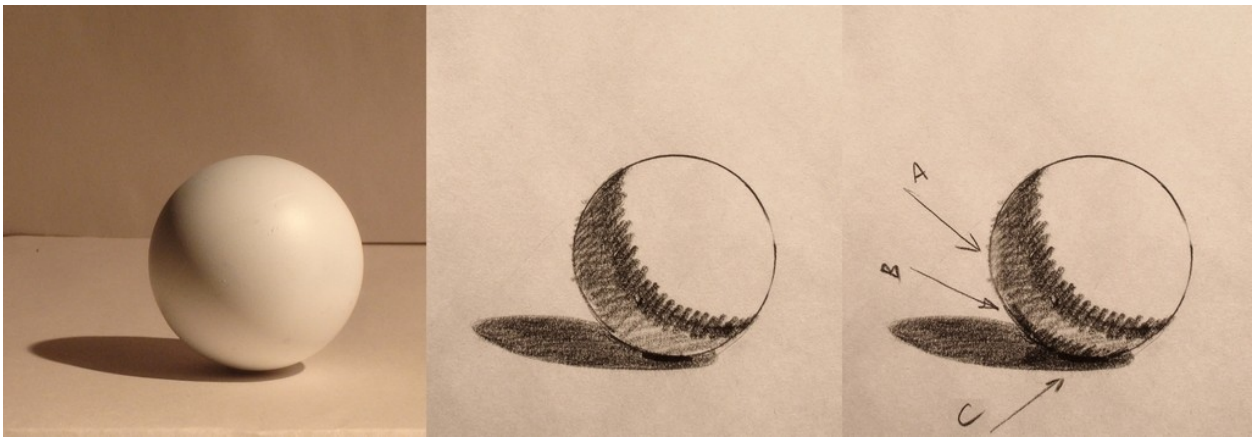


*Figure 85: A: reflected light from background. B: The cast shadow reflects no light onto the sphere. C: The sphere blocks the cast shadow from receiving background light.*

*Practical Application: Form Spheres*

Purpose: To fully model a sphere, showing every modeling factor.

Materials: White sphere.

Place your sphere in form-revealing light. The sphere should cast an obvious shadow from a single light source (fig. 86).

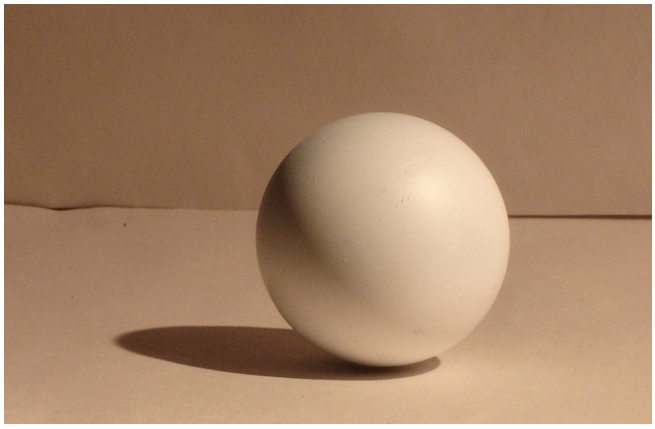

*Figure 86: Form revealing light exhibits all of the modeling factors. You can see both light and shadow.*

Draw or trace a circle on your paper. First, find where the terminator lies on the object. Use your needle to match the angle as your did in the value structure exercise, and then find the point of amplitude of that curve, and then the whole curve of the terminator (fig. 87).

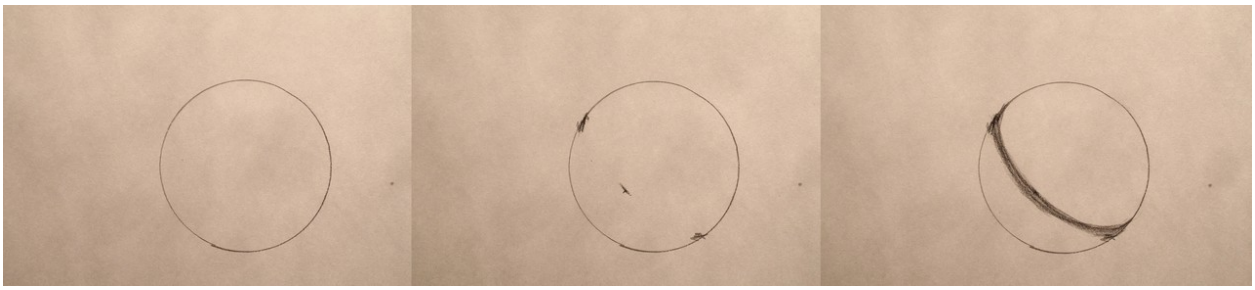

*Figure 87: Find the end points of the terminator, then the amplitude of the curve. Draw the terminator, and remember that it continues around the sphere, it does not end abruptly at the contour of the sphere.*

Next, find the shape of the cast shadow, using critical points to describe the curve. Flatten the entire shadow area to a single, uniform value, disregarding reflected lights and accents for now (fig. 88).

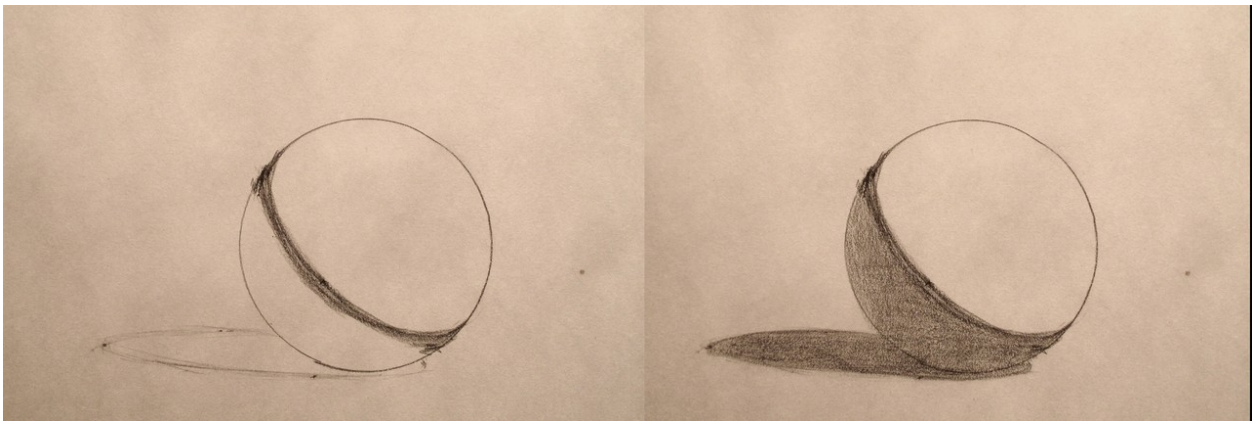

*Figure 88: Draw the cast shadow. Remember that while circles in perspective are perfect ellipses, an ellipse in perspective (like the cast shadow) is usually distorted. The second picture shows the cast shadow and form shadow areas darkened to the same value.*

Now, begin to model the halftones, then the darker lights, then the lights. Ignoring the specular highlight, work from dark to light all the way up to the lightest light on the sphere. Then model in the darks. Darken the cast shadow, and darken the areas that receive the least reflected light first. The reflected light can be very subtle and still look luminous. Remember that reflected light diminishes as the form turns away and gets farther from the reflecting surface. Put in the accent, the highlight, and modulate the edge of the cast shadow. Remember that cast shadows are sharper the closer they are to the thing that is casting them (fig. 89).

*Figure 89: The first picture shows modeling in the lights, the second picture shows modeling in the darks using reflected light, and the third drawing shows refinements line a softened cast shadow edge and an accent.*

Next, find a point on the sphere that is the same value as the background, and use that value as a guideline to fill in the background around your sphere. Remember that there is light reflecting off of the sphere as well, and that will make the table a little lighter by the sphere.

Now, assess your edges. Generally, the hardest edge will be where the biggest value jump occurs, and the softest edge will be where there is very little or no difference in values. Look for distracting light or dark spots, and refine your drawing, erasing and filling in as necessary. You should now have a very believable drawing of a fully modeled sphere (fig. 90).

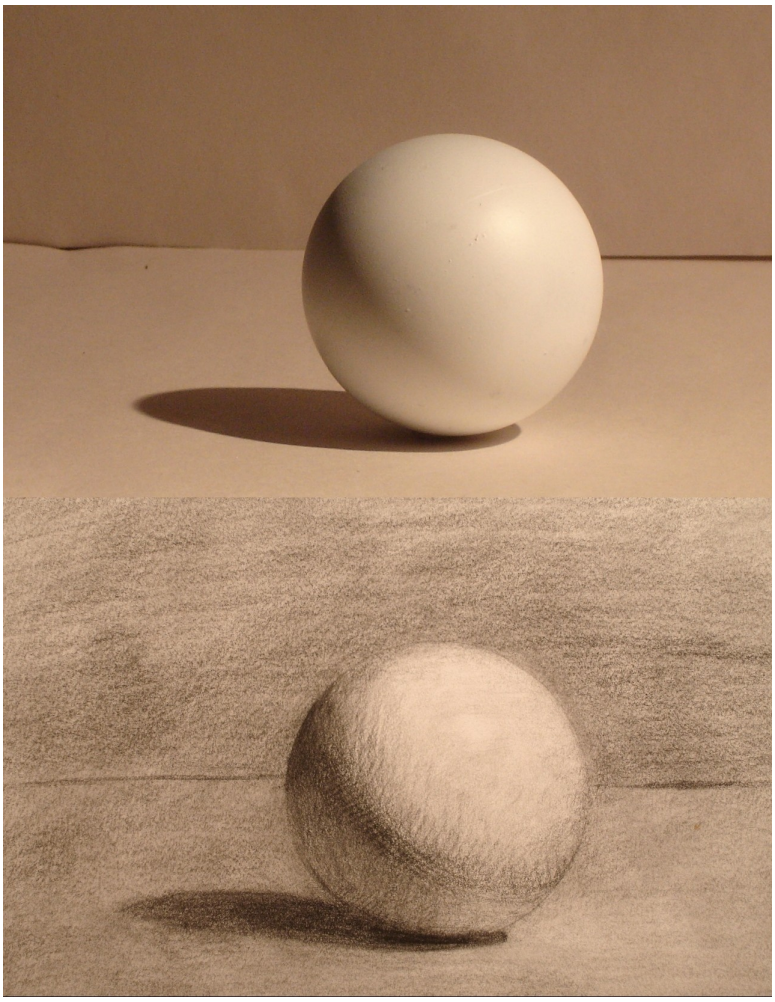

*Figure 90: The reference and the finished sphere. Since this drawing was planned out and executed in steps it took less than ten minutes. If shading the sphere had been started in a haphazard manner it may have taken many times longer to achieve this result. Notice that edges are softer where values are closer, and harder where values are the most different.*

Further Study

Complete this exercise with two spheres of different values. Sensitize yourself to the character of these modeling factors and how they reveal form. Do a still life drawing and bring the entire drawing to this level of finish.

**Linear Perspective and Volume**

Linear perspective is the convergence of lines within a 2-D image in a way that replicates the way that forms appear smaller as they recede in space. The classic linear perspective diagram is of train tracks going off into the distance, but that only illustrates the simplest type of perspectival drawing: single-point perspective.

*Elements of Perspective*

Picture Plane and Ground Lines

The picture plane is the imaginary proxy for the drawing surface. Put another way, the picture plane can be thought of as an imaginary window through which you are viewing the scene (fig. 91). If you were to trace a scene on the surface of a real window you would get an accurate sketch of your subject in perspective. For your drawings you will want to draw on your drawing paper as if it were that window, so that if your drawing paper turned clear all of the lines you drew would overlap with the information in the scene.

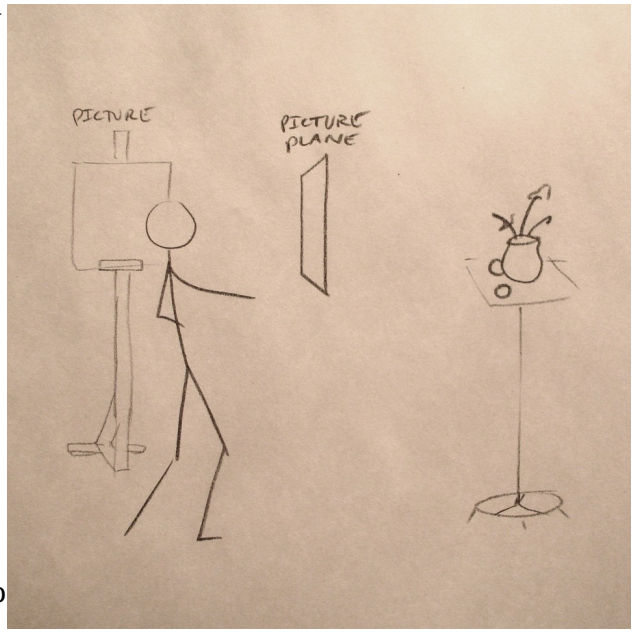


*Figure 91: The picture plane is the same size and shape as the drawing. It can be thought of as your drawing, made clear, and suspended in space between you and the subject.*

A ground line is an imaginary line in the scene that is parallel to the picture plane and the horizon. Each wooden tie in the railroad picture can be thought of as a ground line. If you looked down a sidewalk, the horizontal cracks are ground lines. The sidewalk squares are all of similar size, but notice how they decrease in size as they recede, both in apparent width and apparent distance between the ground lines (fig. 92).

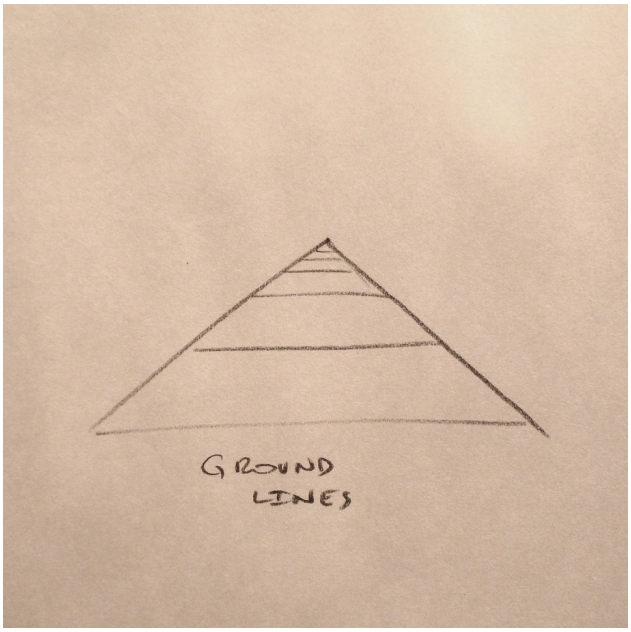


*Figure 92: Ground lines receding in space toward a single point.*

Station Point and Line of Sight

The station point is where the viewer would be standing if they were looking through the picture plane and into the scene. The existence of a station point implies that the perspective of your drawing will only look correct from a single point in space; as you place your vanishing points closer together, the station point moves closer to the picture plane (fig. 93).

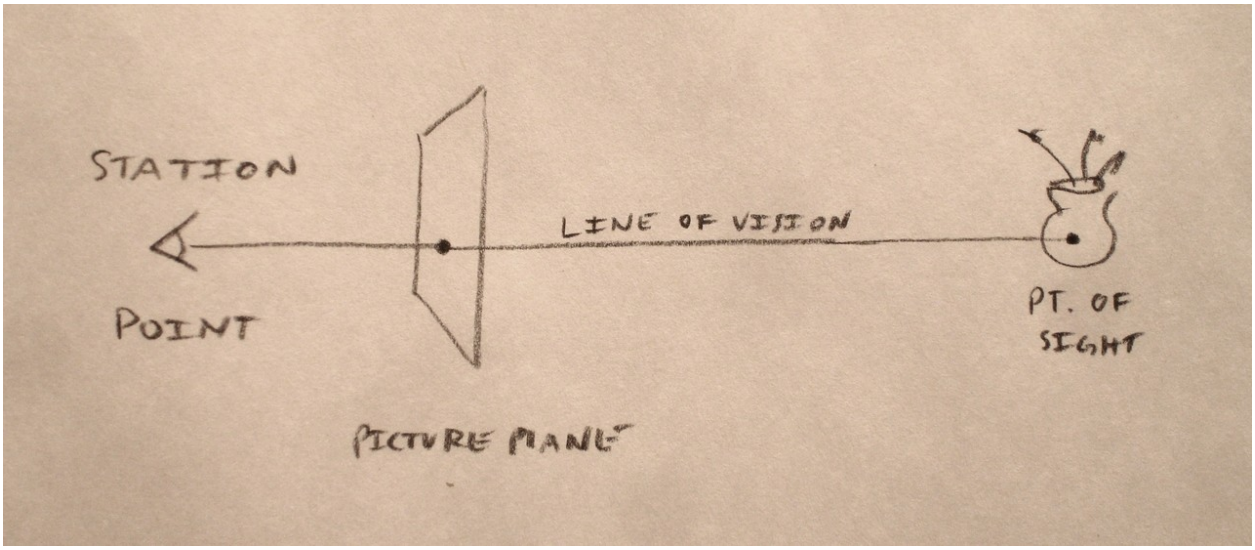


*Figure 93.*

This is important to keep in mind when working on larger drawings; if you are standing close to the paper while drawing, and making all of your perspectival decisions from very close, your drawing may take on a fish-eye lens approach when viewed from farther away. In general, as a viewer approaches the station point of your drawing, the correct point in 3-D space at which to view your drawing in perspective, the more correct the perspective will look (fig. 94). While considering the size of your drawing, the station point and vanishing points, think about the optimal viewing distance for the ideas you are trying to convey through your drawings.

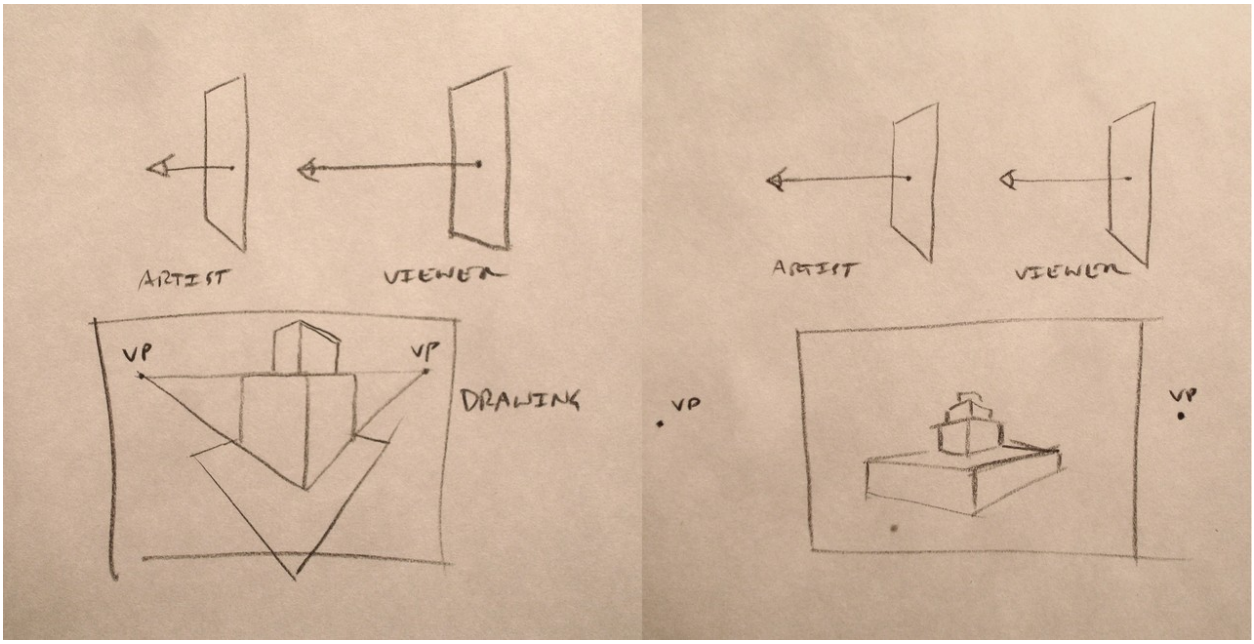


*Figure 94: If the decisions about perspective are made up close, and the drawing is viewed from farther away, the objects in the drawing will appear distorted, like looking through a peep-hole in a front door. If the viewer looks at the picture from the same place that the artist did while figuring out the perspective, the objects will appear as they would in reality.*

Eye Level and Horizon

The horizon line is very important. It is the farthest ground line, and all of the vanishing points for level objects will fall on the horizon line. It is automatically at the level of your eye. Even at the top of a skyscraper, if you look straight ahead you will see the horizon. This relationship works in a reciprocal way through your drawings; the picture should be displayed so that the horizon line in your drawing matches the eye level of the viewer.

You can convey a strong sense of looking either up or down by moving the line of sight either up or down away from the horizon. While the point of sight moves, the vanishing points do not. This has implications for the station point and how the picture should be displayed. The horizon should still roughly match the eye level of your viewers, so if your point of sight is quite low your picture will be lower than eye level and should be hung that way. The same goes for an unusually high point of sight (fig. 95). Additionally, as the point of sight gets farther away from the horizon, the viewing angle at which the picture reads correctly will become more and more extreme and really limit the places where someone can stand and have your picture make sense.

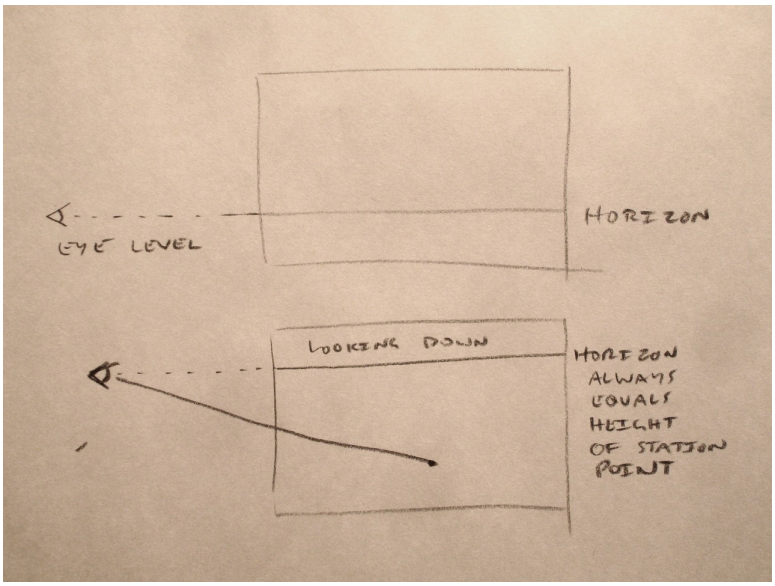


*Figure 95: Top: a picture with a lower horizon is hung so that the viewer's eye level will match the height of the horizon. Bottom: a picture with a higher horizon is hung lower, so that the horizon again matches up with the height of the viewer's eye.*

*Types of Perspective*

Single-Point Perspective

Single-point perspective is easily illustrated by the classic picture of the railroad tracks receding toward a single point in the distance. Our cone of vision, the area that we see that it not distorted by the lenses of our eyes, is about sixty degrees (Woelk). Since our field of vision is a cone, closer objects take up more of our field of vision and appear larger, while further objects take up much less of our field of vision and appear smaller. If you stand in-between a set of railroad tracks and look into the distance, the space between the rails diminishes as the rails get further from your eye, until they appear to disappear into a single point.

Single-point perspective is only really useful in limited situations. You have to be looking straight at something, like looking straight down the middle of some railroad tracks, or straight at a box, or straight down a hallway (fig. 96).

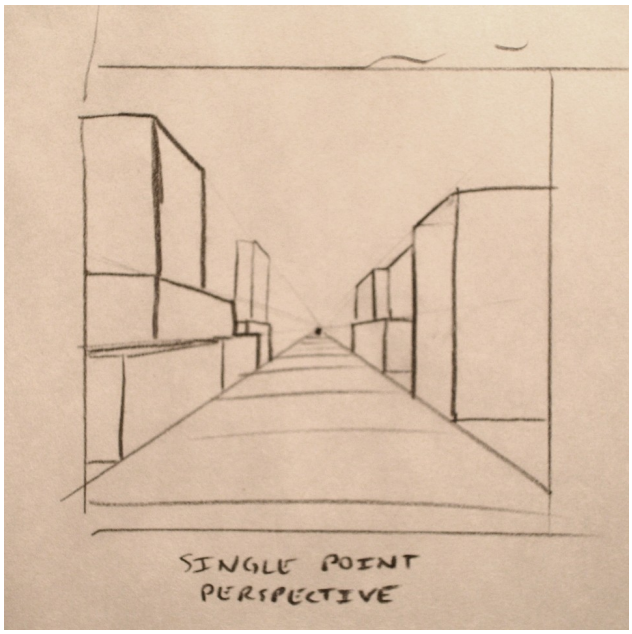


*Figure 96: All of the lines that are not parallel with the picture plane converge toward a single point.*

Imagine looking at a house from across the street. You are facing the house, and your line of sight makes a 90 degree angle to the front of the house. All points on the front of the house can be thought to be on the same plane, which is parallel to the picture plane. Therefore, the left and right corners of the house are equidistant from your eye, and neither side will appear closer to you. Lines from the neighboring structures will appear to converge at a point within the house. Once you change your line of vision one corner of the house, say, the right corner, will appear larger than the rest. The left corner will now appear farther away. If you connect the upper ends and lower ends of these corners together, and extend them into the distance, you will find that they will converge at another vanishing point to the left of your line of sight. Also, the previous vanishing point will appear to have moved to the right of your line of sight. Since there are now two vanishing points being used, the house is now in two-point perspective (fig. 97).

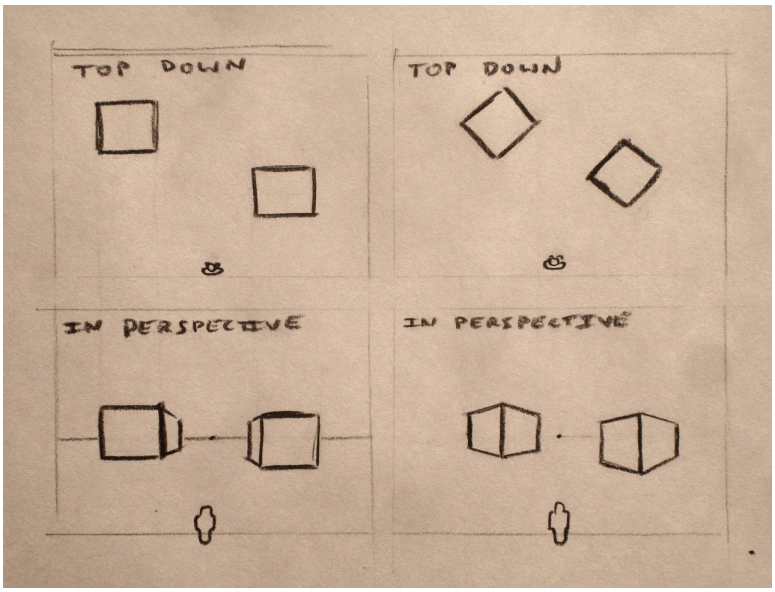


*Figure 97: If the front of the house is parallel to a ground line, you can draw it in single-point perspective. If the house is not parallel, and one corner is closer than the others, the sides of the house will diminish in size as they get farther away; now they are in two-point perspective.*

Two-Point Perspective

Two-point perspective is a very useful model for use in drawing. It can be quite convincing, and is not too difficult to employ.

Two point perspective characterized by the edges of rectangular solids receding toward two points on the horizon, while the vertical edges remain perpendicular to the horizon (fig. 98).

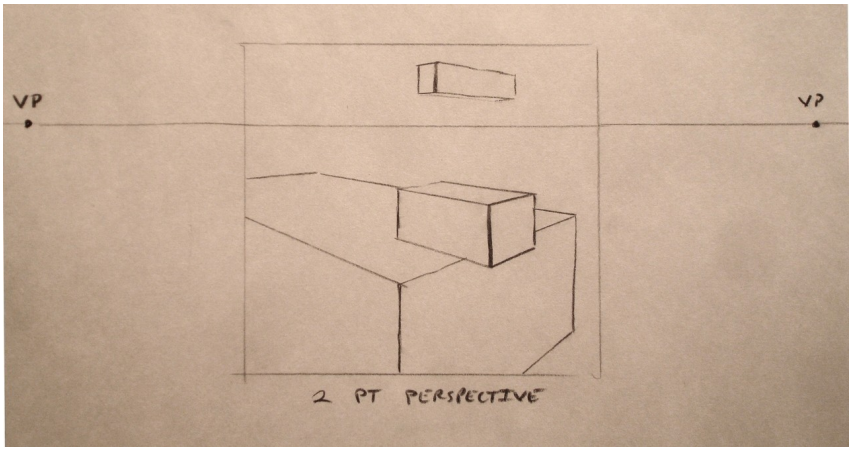


*Figure 98: In this picture, none of the objects are directly facing the viewer. All of the lines that are not straight up and down converge towards the two points at either side.*

There are geometrical ways to work out perspective, and where to place the vanishing points, but they are usually too involved to be practical. If you are drawing a very complicated subject, like detailed architecture, and you want the perspective to be highly accurate, you will have to consult a manual on perspective.

If one side of a cube is directly facing you you can use single point perspective. If that cube is rotated, it will have two vanishing points instead of one. An object's vanishing points move as it turns, tips and tilts along all three axes in space, and it can be very difficult to calculate where the vanishing points should be. Every object in a drawing with a different rotation will have different vanishing points.

The easiest and most practical way to place your vanishing points is by estimation. Use a horizontal plumb and touch it to the lowest extreme of the subject. Then estimate the angle on both sides of the corner. Where these lines intersect your eye level you can place a fairly accurate vanishing point (fig. 99).

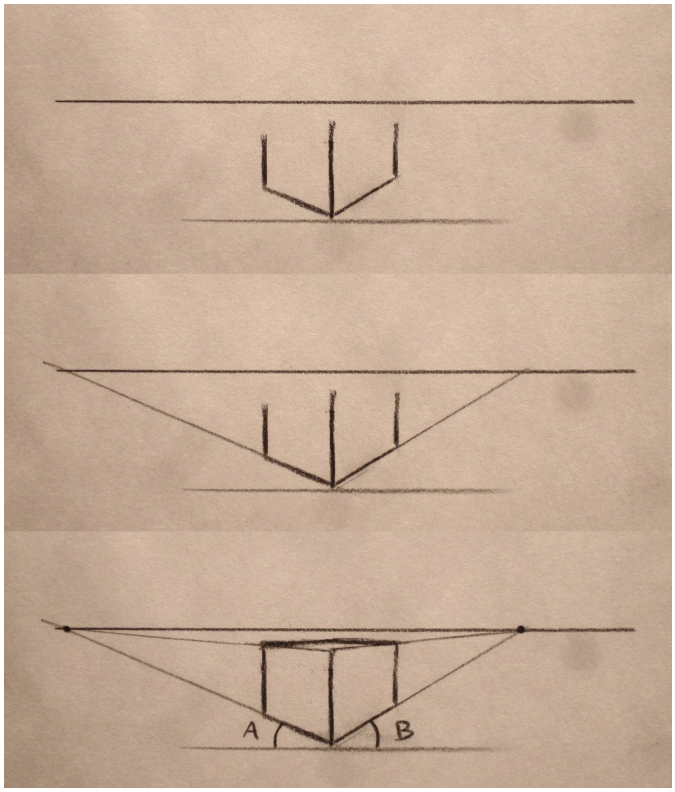


*Figure 99: Finding the vanishing points using angle estimation. If the box were to rotate, the vanishing points would move. Unless the corner is pointing straight at you the vanishing points will be different distances from the point of sight. This method is simple, effective, and obviates complex geometry.*

Three-Point Perspective

Three-point perspective uses three vanishing points, one on either side and one either above or below the horizon. This type of perspective is useful for depicting height or depth when the objects in the scene are not aligned to the picture plane.

In three-point perspective all lines not parallel to the horizon converge, adding vertical convergence to the double-horizontal convergence in two-point perspective. In three-point perspective, place your third vanishing point the either directly above or directly below the point of sight (fig. 100).

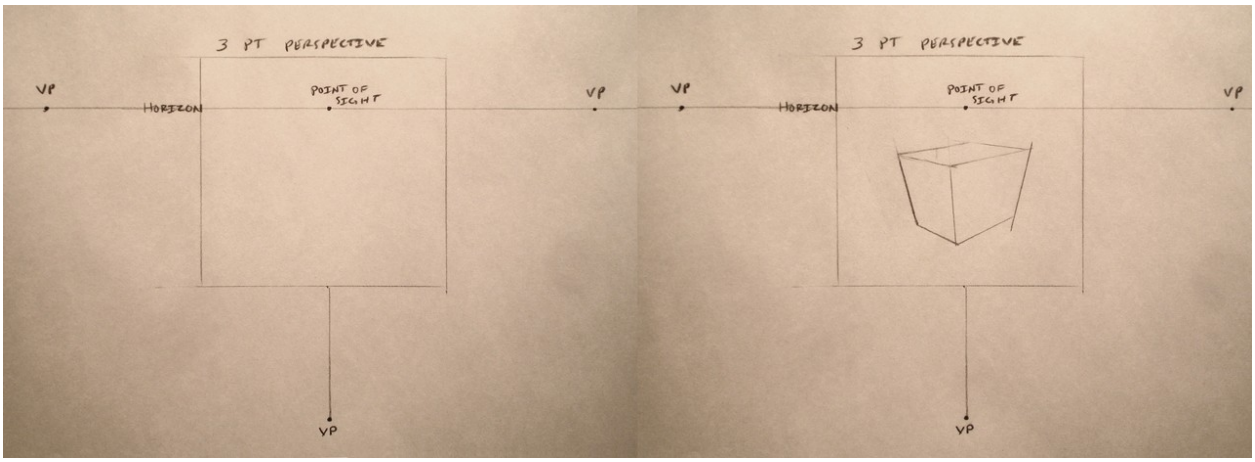


*Figure 100: In this illustration of three-point perspective. Notice how the third vanishing point is directly below the horizon. The object appears distorted because the camera used to take this picture is not at the station point of the drawing. If the camera was moved much closer, the perspective would be correct.*

Normally scenes do not require this type of height or depth; two-point perspective is normally sufficient. Three point perspective, in life, is usually quite subtle. A slight diminishing of width at the top or bottom of an object (depending on whether or not it is above or below the horizon, respectively) can do quite a bit for the perception of depth (fig. 101).

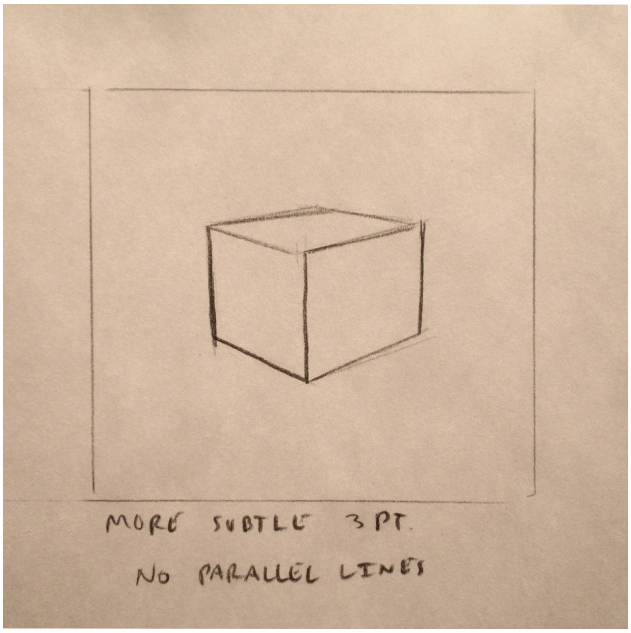


*Figure 101: This picture illustrates a much more subtle version of three-point perspective.*

In all of these examples the objects are sitting flat on a surface that it parallel to the horizon. If these objects were set on an edge, or on a point, their vanishing points would no longer be on the true horizon.

Further Study

Set up a still life with many square-edged objects, and draw it in two point perspective as accurately as you can by using the angle estimation method. Make sure all lines converge as they should. Next, try drawing cubes in three-point perspective, still ensuring proper convergence.

## Monocular Depth Cues

### *Perceiving Three Dimensions*

Our eyes and brains have evolved to sense and perceive the world around us in some incredible ways, but we will be focusing on only those related to vision. Since we, as 2-D artists, are missing an entire dimension, we have to explore how that third dimension is experienced in order to give our viewers an impression of depth.

Even the way our skulls are constructed is due to the way we see. The eyes of prey animals like sheep and antelope, are on the sides of their heads facing outwards. This is to give them a wider field of vision to look out for predators. Our eyes, like those of dogs, cats, and other land predators, are placed frontally in the skull. This enables binocular vision.

Both of your eyes are seeing a different picture of the world. Close one eye, then the other, and there is a marked difference in the way closer things line up with more distant things. When we focus on something close to us, our eyes have to point more inward than if we were focusing on a mountain in the distance. Our brains receive these two different pictures and combine them, telling us how close something is by judging the convergence between our eyes and the differences between the images from each eye.

Since our pictures occupy a 2-D plane, each area is roughly the same distance from the viewer and we cannot really give them any effective cues to replicate their binocular vision. Luckily, binocular vision is only one of the ways that we perceive depth. The rest of the ways that we sense distance can be experienced with one eye and, with one exception, can be incorporated into a 2-D picture. These are called monocular depth cues.

### *Monocular Depth Cues*

There are more ways for our eyes and brains to perceive three dimensions than one might think. Two ways have already been discussed: binocular vision and linear perspective. These

phenomena are called depth cues because they cue, or prompt, our brains into perceiving depth. 2-D artists can use these phenomena to achieve a very convincing illusion of 3-D space. The closer we can approximate, manipulate or exaggerate the natural appearance of these cues the more effective we will be in prompting our viewers into perceiving three dimensions. Since the effectiveness of these strategies relies on how closely we approximate nature, it is important to be aware of just how each of these phenomena works.

Parallax

Parallax, for our purposes, can be defined by the change of the relative positions of observed objects as a viewer changes position. When an observer moves, closer objects, like a tree, will appear to move faster than more distant ones, like mountains. This effect can be easily observed if you close an eye and move your head side to side. An object like a computer screen will appear to change position faster than a picture on the wall.

Parallax relates quite closely to binocular vision; they both arise from seeing the difference between the relative positions of objects from more than one observation point. Unfortunately, since this depth cue relies on a moving observer (or a moving object), it is of less value to the 2-D artist.

Interposition

When one a viewer sees one object partially obscured by another it is called interposition. Drawing one object in front of another is a very powerful tool for showing depth. If objects are shown apart from one another it is hard to tell if they are closer or farther away from us. If just their contours are touching, then they can seem to occupy the same plane and flatten out. If one object is shown partially blocking another, there is an immediate sense that one form is in front of the other, and also a suggestion of volume. Very complicated three-dimensional arrangements can be constructed using only contour and interposition (fig. 102).

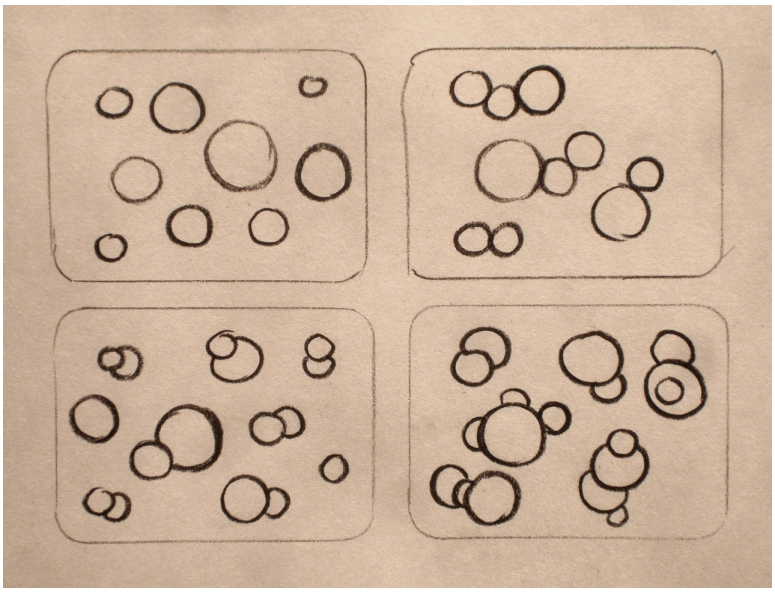

*Figure 102: This drawing shows separate objects, kissing edges, and then two sets of interposed spheres.*

Contour is another way to show volume. If a contour just describes the outside of a form it does very little to convey a sense of depth to that object. When parts of the contour overlap there is a strong sense of form and depth (fig. 103). Overlapping contour is a very powerful tool.

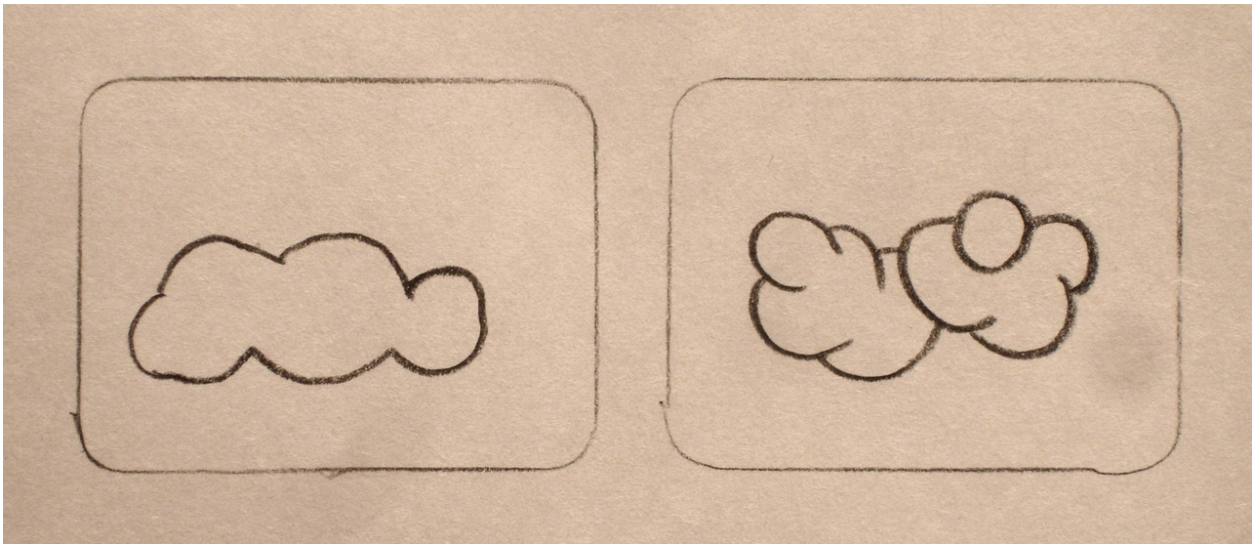

*Figure 103: Two drawings of clouds. Notice how the first one appears very flat, and the second one is given a strong sense of depth and volume by overlapping contour lines.*

Atmospheric Perspective

Atmospheric perspective is the loss of contrast, chroma and detail due to the atmosphere between the observer and the object he is viewing. This is why distant mountain ranges look blue and hazy. This effect comes from water droplets and other particles floating in the air between our eyes and the subject. As the distance increases, so does the amount of dust and water that the light from the object must penetrate to reach your eye. On its way, some of the light is scattered away from the path to your eye. Also, extra light from the sky or some other source may bounce off of something in the air and get on a path to your eye, changing the color of what you see.

What this means is that as the distance between an observer and an object increases, less of the information from the object will reach the observer, and more extra polluting blue light will reach him instead. This results in the loss of contrast, lightening of values, loss of detail, dulling of color and general blue-shift that characterize atmospheric perspective (fig. 104).

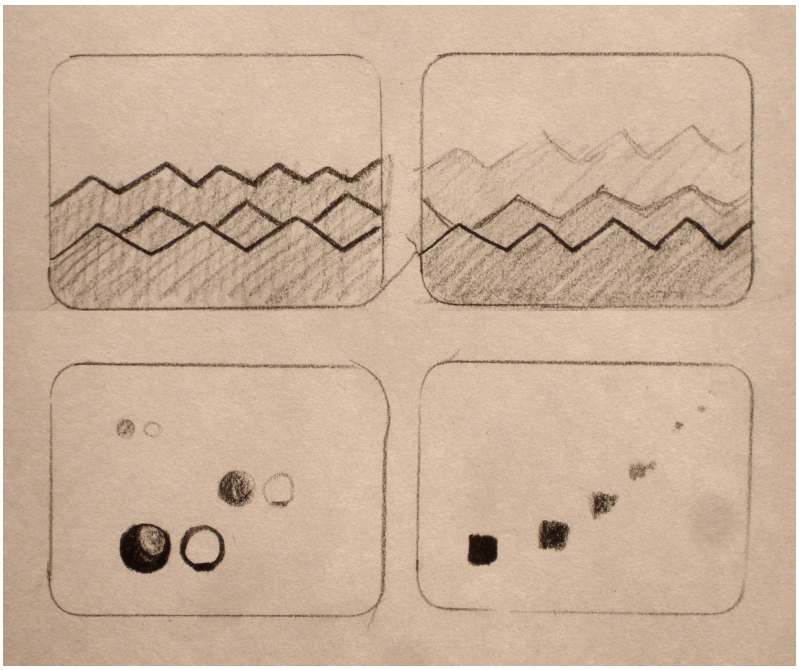

*Figure 104: In the upper left we see a mountain range without atmospheric perspective. Notice how the lines of mountains look as if they could just be cutout paper stacked right on each-other. In the upper right, the loss of contrast and the lightening of value give more of a sense of depth to the middle and background mountains. In the lower pictures we see this same effect in smaller objects. Note how they lose contrast and get lighter as they get farther away.*

Modeled Form and Cast Shadows

Another way that we can show depth in our drawings is by shading. If we draw a cube with an illuminated top plane and two side planes, one in shadow and one in light, then depth is implicitly communicated to the viewer. For there to be a lit side and a shadow side then there must be some 3-D object there. Another depth cue is a cast shadow. An object can cast a shadow over its surroundings,

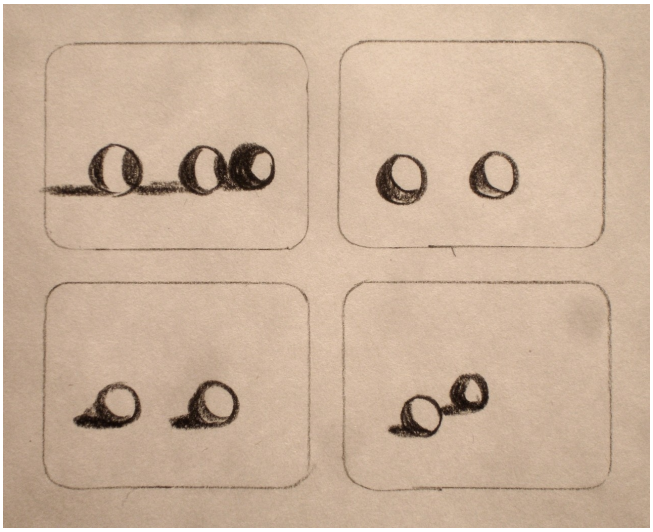

*Figure 105: Clockwise from top left: Objects casting shadows on each other, two objects with form shadows, two objects with form and cast shadows, and an object casting a shadow behind another object.*

including other objects, and the relationship between the object, the shadow and its surroundings will imply a 3-d space and show us what is in front of what. (fig. 105).

Known Size, Relative Size, and Diminishing Size

The sizes of objects in drawings can be a very good indicator of depth. There are things whose sizes can be intuitively judged. Most people have a sense of how big a car is, how big a man is, an apple, a chair, a house, etc. By comparing the sizes of objects in a drawing to each other we can make judgments about their distance from us. This depth cue works in conjunction with perspective; as objects recede in space they look smaller, and decrease in size when compared to closer objects (fig. 106).

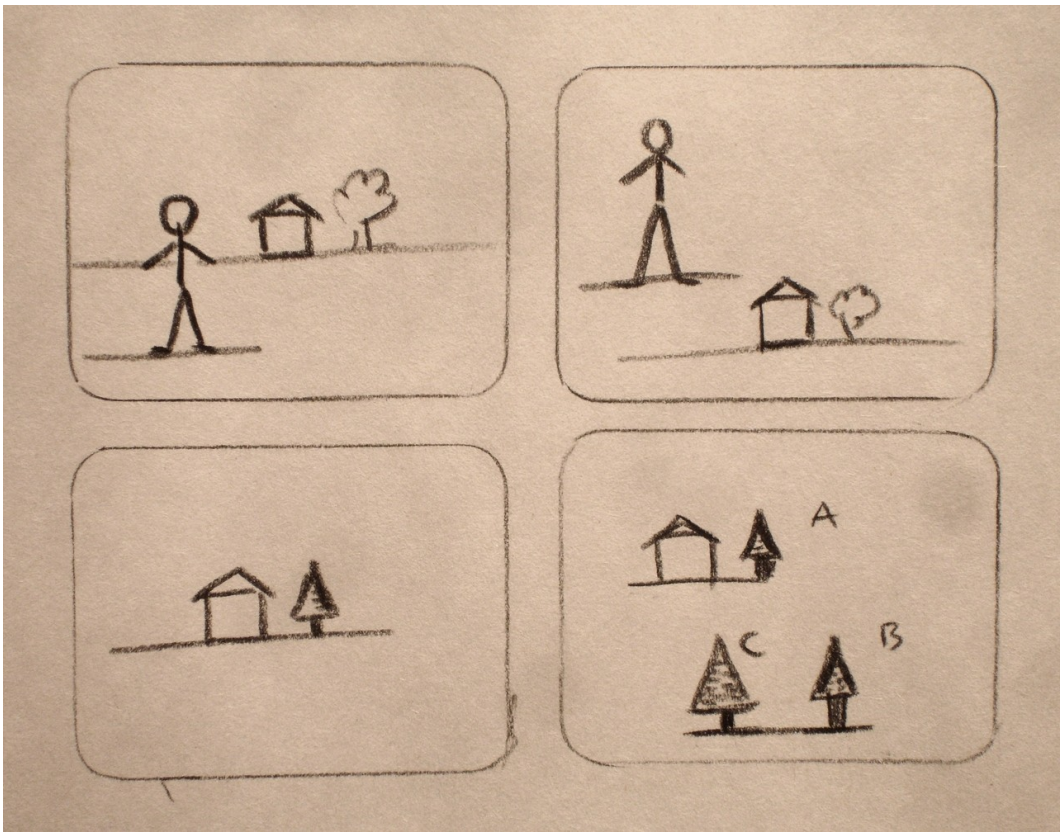


*Figure 106: In the upper drawings a normal sized man is shown closer than a house and a tree. In the second picture, either the house is small or the man is a giant. In the lower pictures we see a house and tree next to each other, then that same house and tree with some more trees in front. Notice how the closer trees appear smaller, even though they are larger than the tree in next to the house.*

This depth cue is so powerful that through the use of perspective we can make the same image appear smaller or larger in a drawing without changing the size at all, just by moving its ground line and giving it context with objects of known size. We can easily make the same image of a tree look small or large, close or far, by where we place it and what we relate it to (fig. 107).

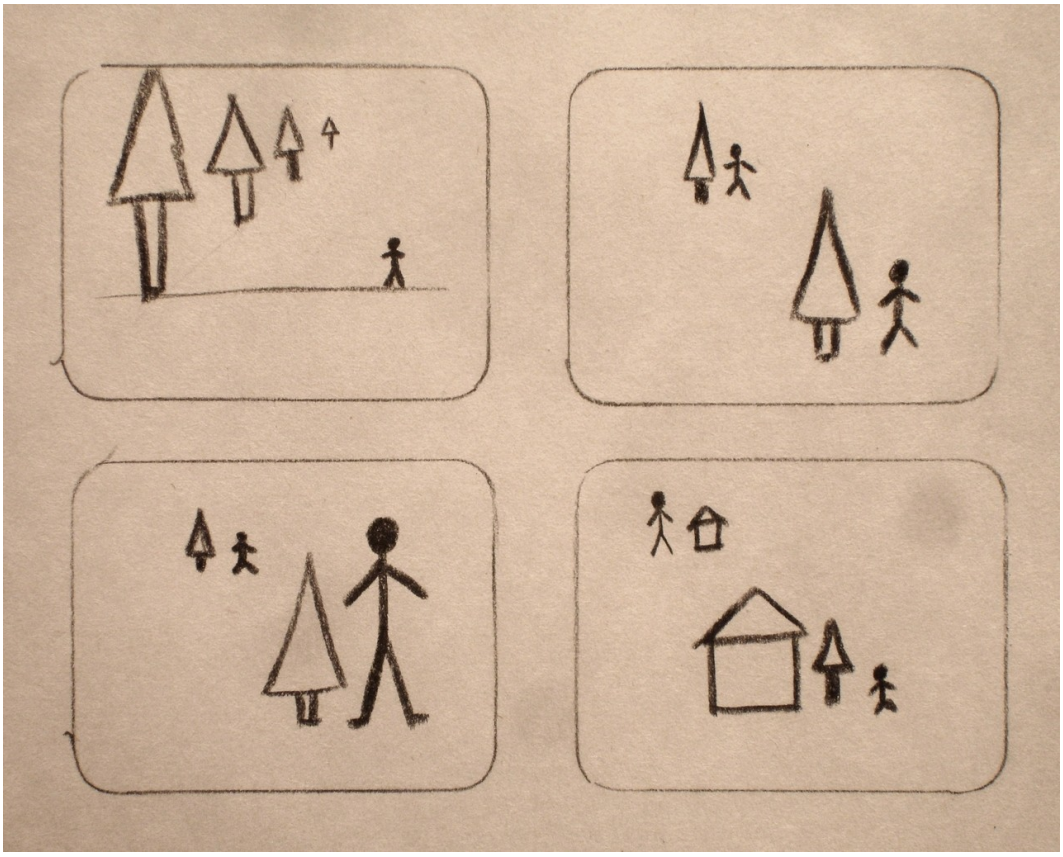

*Figure 107: The upper left picture shows a small man next to a line of huge trees. The upper right shows two men and two trees that appear to be the same size, even though one set is larger. In the third drawing we see in the distance a man next to a large tree while in the foreground there is a man with a small tree. The last picture is confusing. This is because we have a general idea of how big houses, trees and people are, so when they are shown in bizarre relationships it is difficult to figure out what is going on; the further man looks like a giant.*

Depth of Field

Depth of field is an artifact due to the nature of lenses. Our eye can only really focus at one distance at a time; this can be thought of as a radius extending from our eye and describing a spherical section in 3-D space with our eye at the center. The farther an object is from this focused distance the more blurry it will appear (fig. 108).

Depth of field in drawings and paintings is somewhat of an artifact of the industrial age. We do not really notice it in our everyday lives, because everything we look at automatically gets focused in upon. Photography, however, captures an instant at a single focal length. This means that the print will exhibit depth of field; objects closer and farther than the focal length will appear increasingly out-of-focus.

*Figure 108: In this picture the hand is in focus, while the tin of tea is blurry. This gives a strong sense of depth because we know that the tea is farther away than the hand.*

We have grown used to seeing depth of field in photographs and film, and it has been incorporated into the way we perceive depth in a stronger way than before photography. In using depth of field in a 2-D image, we are actually emulating an aspect of photography, therefore playing on the unconscious expectations of our viewers that they have gained by their immersion in a culture of film.

*Practical Application: Still Life Using Monocular Depth Cues*

Purpose: To gain awareness of monocular depth cues, and to practice their conscious use while drawing.

Materials: Still life objects.

Set up a simple still life with a few objects. Place the objects in such a way to take advantage of depth cues like interposition and shadow-casting. Consider placing one object farther away and giving it atmospheric perspective. Overlap contours whenever you can (fig. 109). As with every other exercise, repeat this one over and over with as many different setups and combinations of depth cues that you can think of within the available time.

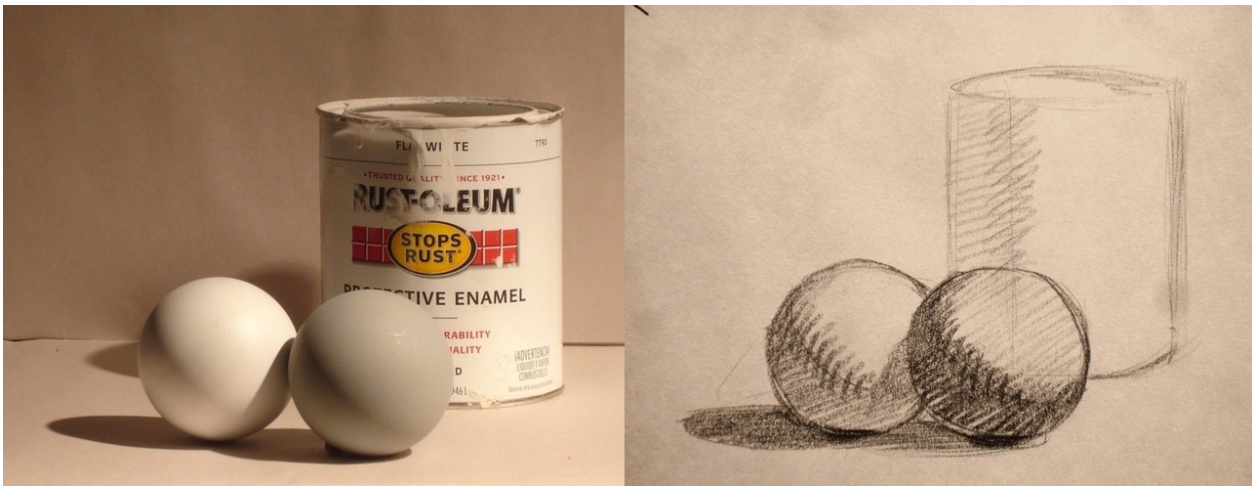


*Figure 109: Observe all of the monocular depth cues that occur in this rapidly executed drawing. The gray ball casts a shadow on the white and blocks part of it, showing that it is in front of the white ball. It also gives us an indication of the light source. Both balls are blocking the paint can. The paint can has been drawn out of focus (exhibiting depth-of-field) and low contrast (exhibiting forced atmospheric perspective).*

Further Practice

Notice monocular depth cues in your subjects as you draw, and incorporate them into your drawing to strengthen the illusion of depth. Do a landscape drawing incorporating depth cues. Incorporate them into figure drawing if you can, using overlapping contour to express interrupting forms.

## Conclusion

It is my hope that by establishing the profound importance of draftsmanship in the visual arts, and by describing how and why most college art programs approach draftsmanship as incidental to the same, that the status quo might be weakened and thrown into question. For too long college students have inherited an outdated, exclusionary, and somewhat backward teaching method, and it is time that they saw what they were missing. It pains me to think of all of the potential creative genius that may have been inhibited or discouraged by not being able to access basic training in draftsmanship, and how such an incredible amount of past and future artwork could benefit so greatly by a stronger foundation in drawing.

The techniques and theories presented herein are not too hard to teach, and they are not too hard to learn, but it *is* hard to make representational drawings without them. The road to continual improvement in any field, be it medicine, engineering, or the visual arts, is not to reject tradition and re-invent the wheel every half-generation. The best way to improve any system is to identify the weakest element in that system and work hard to improve it. For college art education this weak link is most certainly drawing, and improving draftsmanship training in the foundation courses will do more to improve college art education as a whole than anything else possibly could. It is incumbent upon administrators and educators to recognize this and act upon it, and it is incumbent upon students to demand it.

**Notes**

*Origins of Specific Techniques and Theories*

There are three ideas in this paper that are different from the rest, because they are more obscure and I heard them from one person, as opposed to something like comparative measuring which is a fairly commonplace (but sometimes misunderstood) technique. I would like to acknowledge where these ideas came from.

Optical reduction is a technique I learned from Jon deMartin while attending Studio Incamminati in Philadelphia. He learned it from his teacher, Michael Aviano. It is an elegant and extremely powerful measuring technique, and its obscurity is but one example of how most students are missing out on some very powerful information.

Stop modeling, and the specific order of adding value is also from a demonstration by Mr. deMartin. He and his wife translated the material years ago from a 1740 French drawing manual by Charles Jombert called the Methode pour Apprendre le Dessein (or, Method for Learning Drawing). Paris: l'Auteur, 1755.

The core ideas about action lines and gestures are also taken from lectures and demonstrations by Jon deMartin, given at Studio Incamminati from August to December, 2010.

The specific ideas about the conceptual sphere as presented herein are drawn from demonstrations and pointers from Nicholas Hiltner, given while I was attending the Saturday cast drawing class at the Grand Central Academy of Art in Manhattan. He most likely learned it from his teacher, Jacob Collins, but I cannot be sure.

*A Note About the Photography*

All of the photographs in this paper were taken with a 7.1 MP Sony Powershot digital camera. The image quality is not crystal clear, and there are specks of dust on the image sensor that I could not get rid of, so I apologize for the poor quality.

The camera was mounted on a post, at my eye level, and hinged so that it could point at the still life table and then at the paper and back. This was to ensure consistent lighting and framing from shot to shot, and to try and match my station point as closely as possible. As I could not occupy the same space as the camera, some of the drawings are a bit out of perspective when compared to the photographs of the subjects.

**Appendix: Methodology for Establishing the Bias of University Art Programs**

My claim that current university-level arts programs do not emphasize realist technique is substantiated by a review of the stated departmental philosophy and/or goals, and the descriptions of the two-dimensional foundation courses offered in the current course catalogues, as of May 2010, for sixteen B.F.A. granting institutions. If a school offered separate degrees for drawing and painting the literature related to the drawing program is referenced. In order to gain a more representative understanding, three groups of schools were examined.

The first group were the five largest (by overall full-time enrollment during the 2009/10 academic year) state college campuses that grant Bachelor of Fine Arts degrees in painting and/or drawing, and are accredited by the National Association of Schools of Art & Design (NASAD), the national accrediting body for art and design programs (NASAD Member Lists).

The state colleges reviewed include Arizona State University, Ohio State University, Pennsylvania State University, the University of Florida, and the University of Texas at Austin.

The second group is the six largest (located in the US, by full-time enrollment, as of the 2009/10 academic year) member schools of the Association of Independent Colleges of Art and Design (AICAD). To gain membership to AICAD schools must meet the following criteria: Membership in AICAD is open to colleges in the U.S. that are: private, nonprofit, free-standing (that is, not a department of a larger college or university), specialized colleges of art and design, B.F.A. and/or M.F.A. degree granting, and accredited by NASAD and the appropriate regional accrediting agency (New England, Middle States, North Central, Northwest, Southern, and Western) (About AICAD).

The AICAD member schools reviewed include Parsons The New School For Design, Pratt Institute, Rhode Island School of Design, the School of the Art Institute of Chicago, the School of Visual Arts, and the University of the Arts.

Also examined were the five highest rated painting/drawing programs, according to US News (Fine Arts Specialty Rankings: Painting / Drawing), that were not included in either of the above samples. These schools include Columbia University's School of the Arts, Maryland Institute College of Art, Temple University's Tyler School of Art, the University of California, Los Angeles and Yale University School of Art.

**Works Cited**

"2007-08 Tuition Information for Tyler School of Art." *Temple University* 24 Aug. 2009. Web. 5 May 2010.

"AICAD - Find a School by Size." *Aicad.* nd . Web. 3 May 2010.

Aristides, Juliette. *Classical Drawing Atelier: A Contemporary Guide to Traditional Studio Practice*. First edition / First printing. Watson-Guptill, 2006. Print.

Davies, Penelope, J. E. et al. *Janson's History of Art 7th Ed.* 7th ed. Prentice Hall Art, 2006. Print.

deMartin, Jon. *The Properties of Line.* Studio Incamminati. Philadelphia, Pennsylvania. Nov. 2010. Lecture and Demonstration.

"Fine Arts Specialty Rankings: Painting / Drawing." *USNews.* 2008. Web. 3 May 2010.

"Florence Academy of Art: Application Form." *The Florence Academy of Art.* 2010. Web. 5 May 2010.

Jombert, Charles. *Methode pour Apprendre le Dessein*. Paris: l'Auteur, 1755. Print.

Mayer, Ralph. *The Artist's Handbook of Materials and Techniques: Fifth Edition, Revised and Updated*. 5th ed. Viking Adult, 1991. Print.

Meyers, Nicole. "The Aesthetic of the Sketch in Nineteenth-Century France." *The Metropolitan Museum of Art.* Mar. 2009. Web. 5 May 2010.

"NASAD Member Lists." *Nasad.* nd . Web. 3 May 2010.

Phelan, Andrew. "The Bauhaus and Studio Art Education." *Art Education* 34.5 (1981): 6-13. Print.

Raleigh, Henry P. “Johannes Itten and the Background of Modern Art Education.” *Art Journal* 27.3 (1968): 284-7, 302. Print.

“RISD : Rhode Island School of Design : FACTS + FIGURES.” *Risd.* nd . Web. 5 May 2010.

“The Grand Central Academy of Art - Water Street Atelier.” *The Water Street Atelier* nd . Web. 5 May 2010.

Weiner, Lawrence. “Statement of Intent.” 1968: n. pag. Letter.

Woelk, Valerie. “Perspective 101.” *Valeriewoelk.com*. Web. 19 Mar. 2011.

**Bibliography**

"2007-08 Tuition Information for Tyler School of Art." *Temple University* 24 Aug. 2009. Web. 5 May 2010.

"About AICAD." *Aicad.* nd . Web. 3 May 2010.

Ackerman, Gerald M. *Charles Bargue and Jean-Leon Gerome: Drawing Course*. 2nd ed. Art Creation Realisation, 2007. Print.

"Adrian Gottlieb Studio & Atelier | What Is An Atelier?." *Gottlieb Studios* nd . Web. 5 May 2010.

"AICAD - Find a School by Size." *Aicad.* nd . Web. 3 May 2010.

"ARC Approved™ Ateliers, Academies, and Workshops." *Art Renewal Center.* nd . Web. 5 May 2010.

Aristides, Juliette. *Classical Drawing Atelier: A Contemporary Guide to Traditional Studio Practice*. First edition / First printing. Watson-Guptill, 2006. Print.

---. *Classical Painting Atelier: A Contemporary Guide to Traditional Studio Practice*. 1st ed. Watson-Guptill, 2008. Print.

"Artist of the Week 45: Lawrence Weiner | Art and Design | Guardian.co.uk." *Guardian.* 17 June 2009. Web. 5 May 2010.

"Artists' Oil Colour." *Winsor & Newton.* 2010. Web. 5 May 2010.

"BFA - Bachelor of Fine Arts Degree at Parsons The New School." *Newschool.* 2010. Web. 3 May 2010.

"BFA : SAIC - School of the Art Institute of Chicago." *Saic.* 2010. Web. 3 May 2010.

Bridgman, George B. *Bridgman's Complete Guide to Drawing From Life: Over 1,000 Illustrations*. Sterling, 2001. Print.

Buonarotti, Michelangelo. *The Creation of Adam*. 1511. *Sistine Chapel*, Vatican. Fresco.

Clottes, Jean. "Chauvet Cave (ca. 30,000 B.C.)." *The Metropolitan Museum of Art.* Oct. 2002. Web. 5 May 2010.

"Contemporary Practices (for Undergraduate Students Only) : SAIC - School of the Art Institute of Chicago." *Saic.* 2010. Web. 3 May 2010.

"Course Announcement." *Risd.* 8 Apr. 2010. Web. 3 May 2010.

Davies, Penelope, J. E. et al. *Janson's History of Art 7th Ed.* 7th ed. Prentice Hall Art, 2006. Print.

Da Vinci, Leonardo. *La Giaconda (Mona Lisa)*. *Musée du Louvre*, Paris.

1503. Oil on Poplar.

---. *Madonna of the Rocks*. 1483. *Musée du Louvre*, Paris. Oil on Panel (Transferred to Canvas).

deMartin, Jon. *Measuring Techniques.* Studio Incamminati. Philadelphia, Pennsylvania. Mar. 2011. Lecture and Demonstration.

---. *Modeling Techniques.* Studio Incamminati. Philadelphia, Pennsylvania. Oct. 2010. Lecture and Demonstration.

---. *The Properties of Line.* Studio Incamminati. Philadelphia, Pennsylvania. Nov. 2010. Lecture and Demonstration.

Dorian, Apollo. *Values for Pictures Worth a Thousand Words: A Manual for Realist/Representational Painters*. Tuscon AZ.: Apollodorian Publishers., 1989. Print.

Duchamp, Marcel. *Fountain*. 1917. Print.

Eakins, Thomas. *A Drawing Manual*. Philadelphia PA: Philadelphia Museum of Art, 2005. Print.

"Fine Arts Specialty Rankings: Painting / Drawing." *USNews*. 2008. Web. 3 May 2010.

"Florence Academy of Art: Application Form." *The Florence Academy of Art.* 2010. Web. 5 May 2010.

"Gamblin Oil Painting Materials." *Gamblin Colors* nd . Web. 5 May 2010.

"Heilbrunn Timeline of Art History." *The Metropolitan Museum of Art.* 2010. Web. 4 May 2010.

Hiltner, Nicholas. *Conceptual Sphere.* The Grand Central Academy of Art. New York, NY. Nov. 2009. Lecture and Demonstration.

Jombert, Charles. *Methode pour Apprendre le Dessein*. Paris: l'Auteur, 1755. Print.

Larmann, Ralph. "Art Studio Chalkboard: Exteriors in 2-Point Perspective." *Evansville.edu*. Web. 21 Mar. 2011.

Long, Jim, and Joy Turner Luke. *The New Munsell Student Color Set*. 2nd ed. Fairchild Pubns, 2001. Print.

Mayer, Ralph. *The Artist's Handbook of Materials and Techniques: Fifth Edition, Revised and Updated*. 5th ed. Viking Adult, 1991. Print.

---. *The Painter's Craft*. Penguin (Non-Classics), 1979. Print.

Meyers, Nicole. "The Aesthetic of the Sketch in Nineteenth-Century France." *The Metropolitan Museum of Art.* Mar. 2009. Web. 5 May 2010.

"NASAD Member Lists." *Nasad.* nd . Web. 3 May 2010.

"Parsons :: Academics :: Undergraduate :: Foundation :: Courses." *Newschool.* 2010. Web. 3 May 2010.

Pastorino, Ellen. *What Is Psychology?* Belmont CA: Wadsworth/Thomson Learning, 2006. Print.

Phelan, Andrew. "The Bauhaus and Studio Art Education." *Art Education* 34.5 (1981): 6-13. Print.

"Pratt Institute | Academics | Academic Resources | Course Catalog." *Pratt.* nd . Web. 3 May 2010.

"Pratt Institute | Academics | School of Art & Design | Undergraduate | Undergraduate Fine Arts | Undergraduate Fine Arts Areas of Emphasis | Drawing." *Pratt.* nd . Web. 3 May 2010.

"Program: Painting/Drawing - Bachelor of Fine Arts - The University of the Arts - Acalog ACMS™." *Uarts.* 2010. Web. 3 May 2010.

"Purdue OWL." *Purdue* 2010. Web. 4 May 2010.

Raleigh, Henry P. "Johannes Itten and the Background of Modern Art Education." *Art Journal* 27.3 (1968): 284-7, 302. Print.

"RISD : Rhode Island School of Design : FACTS + FIGURES." *Risd.* nd . Web. 5 May 2010.

"RISD : Rhode Island School of Design : PAINTING." *Risd.* nd . Web. 3 May 2010.

Seurat, Georges. *Bathers at Asniéres*. 1884. Print.

Speed, Harold. *Oil Painting Techniques and Materials*. Dover Publications, 1987. Print.

---. *The Practice and Science of Drawing*. 3rd ed. Dover Publications, 1972. Print.

"SVA UG Entire." *Schoolofvisualarts.* 30 Aug. 2009. Web. 3 May 2010.

"The Grand Central Academy of Art - Water Street Atelier." *The Water Street Atelier* nd . Web. 5 May 2010.

"The University of the Arts : BFA in Painting/Drawing." *Uarts.* 2010. Web. 3 May 2010.

Weiner, Lawrence. "Statement of Intent." 1968: n. pag. Letter.

Wilcox, Michael. *Blue and Yellow Don't Make Green*. 2nd ed. School of Color, 2002. Print.

Woelk, Valerie. "Perspective 101." *Valeriewoelk.com*. Web. 19 Mar. 2011.

Wolfe, Tom. *From Bauhaus to Our House*. New York: Farrar Straus Giroux, 1981. Print.

---. *The Painted Word*. 1st ed. New York: Picador/Farrar Straus & Giroux, 2008. Print.

**Academic Vita of Andrew McManus**

Andrew McManus

915 N 4TH ST

Philadelphia, PA, 19123

andrew@amcmanus.com

Education: Bachelor of Art in Drawing and Painting, Penn State Abington, 2011

Honors in Letters, Arts and Sciences

Thesis Title: An Argument for the Improvement of Draftsmanship Training in University Level Fine Arts Programs, With Suggested Syllabus and Coursework

Thesis Supervisor: Bonnie Levinthal

Studio Incamminati Part-Time Professional Program, 2010 – Present

Cambridge Street Studios, 2011 – Present

Experience: Sergeant, United States Marine Corps, 2003 – 2007

Independent Museum Contractor, 2003 – Present.

Exhibitions: Penn State Abington Senior Show, Abington Art Center, 2011

Bertha Lear Exhibition, 2009 - 2011

Honors: Bertha Lear Exhibition, Best 2-D Artwork, 2009

Alpha Sigma Lambda Honors Society

Phi Kappa Phi Honors Society

Publications: Abington Review, 2009 - 2011