



# The Art Students League of New York

215 West 57th Street, New York, NY 10019 TEL: 212-247-4510 FAX: 212-541-7024  
www.theartstudentsleague.org EMAIL: info@artstudentsleague.org

## **COSTA VAVAGIAKIS** **Anatomy for Artists, Life Drawing**

Most of the following supplies may be purchased at the League's art supply store, located in the lobby.

### **GRAPHITE PENCILS**

Graphite pencils (1 each) 2B, B, HB, F, H, 2H, 3H, 4H, 5H, 6H  
Mechanical pencils 5MM. & .9MM HB, F, H, 2H

The leads of drawing pencils are made with ground graphite and filler and the ratio of one to the other determines what grade of hardness a pencil is. The type of filler used depends on the brand. The "harder" grades (F - 9H) contain more filler, and the "softer" grades (HB - 9B) contain less. While the correct ratio of filler to graphite for each hardness grade is well known, I've never found two brands of drawing pencils that use the same formula, and one brand's 2H pencil can be the same as another's 4H. I've even found huge variations in consistency between different lots of the same brand, so it's a good idea to test each new pencil.

Drawing Pencil Grades

Extremely Hard - 9H to 7H Very Hard - 6H to 5H Hard - 4H to 3H

Medium Hard - 2H to H Medium - F to HB Medium Soft - B to 2B

Soft - 3B to 4B Very Soft - 5B to 6B Extremely Soft - 7B to 9B

### **WHITE CHARCOAL (for working with colored paper)**

White charcoal pencil (General's and/or Pitt)

General's white drawing stick

White Conte crayon, 2B

White Nupastel

### **ERASERS**

Kneaded eraser

Tuff stuff erasure stick

Faber-Castell Perfection Eraser #7056 & 7058

Students may work on white or colored paper or both.

### **DRAWING SURFACES**

Drawing pads (14 x 17" or 18 x 24") for graphite

Charcoal/Pastel pads (11 x 14", 12 x 16" or 18 x 24) assorted colors for graphite or charcoal and/or Individual Sheets (more about paper below)

### **SUGGESTED PAPERS FOR GRAPHITE**

Fabriano Ingres (assorted colors)

Fabriano Tiziano (assorted colors)

Fabriano Roma (assorted colors)

Strathmore Bristol 500 2-3 ply (Plate or Kid)

Strathmore Charcoal (assorted colors)

Arches Ingres MBM

Arches Platine

Durotone Newsprint aged

Durotone Butcher paper

Durotone Packing Kraft

Borden & Riley #120 Bristol (Plate or Vellum)

Stonehenge

Hahmemuhle Ingres (assorted colors)

Hahmemuhle Bugra Butten (assorted colors)



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Students will be encouraged to explore working with graphite on both white and/or toned paper using a white chalk. The toned papers I prefer working on are Fabriano Ingres and Fabriano Tiziano. They are called Charcoal and Pastel papers. They come in white and assorted colors in variety sizes of paper and pads. Some other Manufactures of toned papers are Arches, Strathmore, Hahmemuhle and Canson. The white papers of choice besides the above are Bristol paper and pads. Borden & Riley and Utrecht produce 2 ply Bristol pads (vellum or plate surface) 14 x 17" or 19 x 24". The paper I have used over the years is Strathmore 2ply Bristol (vellum surface) 29 x 23" or 30 x 40" sheets. You can cut the sheets for variety in shapes and sizes, i.e., from a 29 x 23" sheet you can get (2) 11 1/2 x 14 1/2 " and a 14 1/2 x 23".

## **BOARDS**

Sketch board or Foam Board (cut a little larger than paper size)

## **MISCELLANEOUS**

Binder Clips (small, medium and large 2 of each)

Banker Clips (small and large 2 of each)

Artist Tape (white)

Blending Stumps (small and medium)

Alvin Snap Off Blade Cutter (small)

Knitting Needle or Straight Skewer

View-finder: Make one of cardboard. Make 2 "L" shapes, about 7"-8" on the leg and 1 1/2" wide. Use binder clips or buy View Catcher



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## PAPER TERMS USED FOR WEIGHT AND SURFACES

Drawing papers:	bond, plate bristol, vellum, sketch charcoal, laid, Ingres pastel	smooth medium coarse rough
Stationary papers:	writing text cover	light weight medium weight heavy weight
Printmaking papers:	plate vellum kid	smooth surface medium surface rough surface
Watercolor papers:	hot pressed cold pressed rough	smooth surface medium surface rough surface

These are some papers that work well with graphite, charcoal or chalks:

ARCHES COVER ♦  
ARCHES MBM INGRES (MICHALLET)\*  
ARCHES TEXT LAID\*/ARCHES TEXT WOVE  
CANSON MI TEINTES \* ♣  
COVENTRY RAG ♦  
CRANE'S CREST LAID \*/CRANE'S CREST WOVE  
DUROTONE Butcher, Newsprint, Kraft  
FABRIANO INGRES \* ♣  
FABRIANO TIZIANO \* ♣  
FOLIO ♦  
MAGNANI Annigoni ♦  
RIVES BFK ♦  
RIVES Heavyweight  
STONEHENGE ♦  
STRATHMORE CHARCOAL \* ♣  
STRATHMORE BRISTOL Series 500

\* coarse surface

♦ printmaking papers

♣ available in several colors

You can find these papers at the following stores:

1. New York Central	62 Third Avenue	212-473-7705
2. Utrecht	41 Fourth Avenue	212-777-5353
3. Pearl Paint	308 Canal Street	212-431-7932
4. Blick	1 Bond Street	212-533-2444

# BEFORE YOU BUY PAPER!



## What's the Difference? Choosing the Right Paper

### Papermaking:

There are three different ways to produce paper:

**Handmade Paper** sheets are usually formed individually by highly skilled craftsmen using natural or specialty fibers. These are principally cotton and linen flax though other materials are used to impart special characteristics. Handmade papers have an irregular surface that many artists find appealing in their work. These are the most expensive but most beautiful sheets.

**Mould-made Paper** sheets are considered to be an imitation of handmade papers. They still have a random distribution and arrangement of fibers but are moulded from high-speed cylinder-mould machines that simulate the handmade process. These sheets are generally more durable under intense use.

**Machine-made Paper** sheets have a surface texture that is more mechanical than handmade or mould-made and is generally less durable. A great paper for sketching and drawing due to its smooth regular texture. Do not expect these papers to have the same durability and feel as handmade or mould-made papers.

### Ingredients:

There are several different ingredients used to create a sheet of paper:

**Cotton Rag** papers are made from the longest cotton fibers and generally considered to be of the highest quality – lasting up to a hundred years. A good cotton paper can handle heavy erasing and reworking showing minimal signs of wear and tear. Cotton is torn or “beaten” into individual fibers to create a thick soup consistency and moulded to create this paper.

**Cellulose** or wood pulp papers are generally of a lesser quality. A high acid content will destroy the paper gradually over time. Yellowing, as seen in newsprint and construction paper, is a result of the acidity of the wood pulp papers. However, buffers can be added to produce an Acid-Free cellulose paper.

Still, some papers are made from determined amounts of both wood pulp and cotton rag.

**Sizing** is a material, such as gelatine, casein, starch or rosin, which is added to papers to make a surface less absorbent so that paints do not absorb too deeply into the fibers of the paper. Paper can be internally sized (added while the paper is still in a liquid state), externally sized (added to the surface of the paper after the sheet is dried) or both internally and externally sized. Generally, the more a paper is sized or depending on the type of sizing used, the harder a paper becomes and the more durable it is against reworking, scrubbing or scumbling.

### Applied Textures:

There are three different textures papermakers apply that allow for different effects:

A watercolor or drawing paper is considered **Rough** when it has a surface with a prominent texture or “tooth”. This texture is a natural result from allowing the paper to dry without smoothing or pressing.

The paper is said to be **Cold Pressed (Not/Cold Press)** when it has a moderate texture or “tooth”. This effect is achieved by pressing the wet paper to smooth it slightly. Cold Pressed is easily the most popular texture among artists.

The Paper is said to be **Hot Pressed** when it has a smooth texture and little if any “tooth”. This effect is achieved by passing the fresh paper through heated rollers during manufacturing. Watercolors become more loose and difficult to control, but create beautiful effects. This is a great paper for drawing and sketching.

### Weight:

What is with the differences in weight?

**Weight** is an important consideration when selecting a paper. As a general rule, paper is measured by the weight of one ream of 22" x 30" paper (500 sheets). These are standardized for papers smaller than 22" x 30". Their measurements are determined based on the weight of a ream sized at 22" x 30". Weights include, 60, 80, 90, 140, 200, 260 and 300 pounds. Heavier weight papers are thicker and can handle more water without buckling, curling or warping and can also handle much more abuse than lower weight, thinner papers.

# GLOSSARY OF PAPER TERMS

**ACID FREE (NEUTRAL pH)** Papers that are without acid in the pulp. Acid free paper has a pH of 7.0. If prepared properly, papers made from any fiber can be acid free.

**BUFFERING** The neutralizing of acids in paper by adding an alkaline substance (usually calcium carbonate or magnesium carbonate) into the paper pulp. The buffer acts as a protection from the acid in the paper or from pollution in the environment.

**CYLINDER MACHINE** A papermaking machine in which a wire covered cylinder rotates partly submerged in a vat containing dilute paper stock. The sheet is formed on the outside of the wire as the water drains throughout. The paper is lifted from the wire by an endless felt. Also referred to as a mould machine or cylinder mould machine. "Mouldmade" paper is made on a cylinder machine.

**HANDMADE PAPER** Paper made by hand using a mould-a frame which is covered with a flat rigid screen (Western) or flexible screen (Oriental). In both cases, the mould is covered by a flat frame called a deckle to contain the run-off of wet pulp, dipped into a vat of wet pulp, shaken to distribute the fibers evenly and drained of its excess water. The wet mat of fibers remaining is the newly formed sheet, which is then dried against blankets & may be hot pressed, cold pressed, or air dried

**CELLULOSE** The chief constituent of the cell walls of all plants. All plants contain tissue that, when properly processed, will yield cellulose. Cotton in its raw state contains about 91% and is the purest form of natural cellulose. Other sources for papermaking include hemp (77%), softwoods and hardwoods (57% to 65%), and kozo (66% to 77%).

**DECKLE EDGE** The feathery edge which is the result of the natural run-off of wet pulp when making handmade and mouldmade paper, or the result of sheets being torn while wet. The edge is simulated in machine made papers by "cutting" them with a stream of water when still wet.

**HOT PRESSED** A paper surface that is smooth, produced by pressing a finished sheet through hot cylinders.

**HIGH ALPHA CELLULOSE** A very pure form of wood pulp which is considered to have the same longevity as cotton or other plant fibers.

**CHAIN LINES** The lines visible on laid paper, parallel with the grain direction, usually about one inch apart.

**COLD PRESSED** A paper surface with slight texture produced by pressing the finished sheet between cold cylinders.

**DIMENSIONAL STABILITY** The degree to which a paper will maintain its size and shape when subjected to changes in moisture content and relative humidity. Very important in maintaining registration in printing.

**LAID PAPERS** Papers with a "grid" pattern in the sheet, resulting from the pulp resting against wires on the papermaking mould screen. "Laid" lines are closely spaced while "chain" lines are farther apart & run parallel with the grain direction of the sheet, important when folding papers, especially to bookbinders.

**COLORFAST (LIGHTFAST)** A color that is resistant to the action of external agents, such as light, acids and alkalis. Paper color that is resistant to change from aging or from exposure to light, heat, or other adverse conditions. Non-fading over long exposure to daylight. Lightfast and sunfast are variations of the term.

**FORMATION** The arrangement of fibers in a sheet of paper, which can be seen by holding a sheet of paper to a light source. The formation of the sheet is determined by composition of the fibers, fiber length, machine speed and shake, amount of filler and other factors. Formation can run from "tight" or "close" to "wild" and is a major factor in determining how the sheet will perform, affecting factors like levelness, strength and dimensional stability.

**LIGNIN** A component of the cell walls of plants that occurs naturally, along with cellulose. Lignin is largely responsible for the strength and rigidity of plants, but its presence in paper is believed to contribute to chemical degradation. To a large extent, Lignin can be removed during manufacture.

**MACHINEMADE PAPER** Paper made on a very rapid running machine called a "Fourdrinier", producing consistent quantities of sheets or rolls.

**GSM. (GRAMS PER SQUARE METER)** The gram weight of a hypothetical square meter of a particular type of paper, a good comparative measure because it does not vary with sheet size

**MOULDMADE PAPER** Paper made by a slowly rotating machine called a cylinder-mould that simulates the hand-papermaking process. Fibers become more randomly intertwined than in machine made papers, producing a stronger, more flexible sheet or roll.

**OPACITY** Opacity determines the amount of "show through" of printed matter on the reverse side of the paper and the sheet's hiding power of printing or any dark material on an adjacent sheet. As basis weights are reduced, it becomes increasingly difficult and costly to maintain sufficient opacity. The higher the opacity reading, the more opaque the sheet

**RICE PAPER** A common misnomer used to describe Oriental papers. There are no papers made from rice, although rice starch was traditionally used to size papers made of Kozo (mulberry plant), Gampi, or Mitsumata.

**ROUGH** A heavily textured paper surface produced by placing wet sheets of paper against textured blankets or air drying (or both).

**VELLUM** A paper surface that is finely textural. Vellum is also used to designate heavy weight, translucent drawing or drafting paper.

**WATERMARK** The translucent design or name easily visible when a sheet is held to the light. A design is sewn onto the papermaking screen with raised wire. When the sheet is formed, the pulp settles in a thinner layer over the wire design.

**PIGMENT** A finely powered coloring material used in paints and inks. Pigments are used in paper to alter physical properties as well as to add color and improve brightness and opacity. A pigment is insoluble in the liquid vehicle with which it is mixed, imparting its color effect by being spread over a surface.

**PLY** A single layer of paper. A term used when several sheets of paper are laminated together to form a board.

**PULP** Any cellulose plant fiber (cotton, linen, wood, Japanese plants) cleaned and beaten into a wet mixture used to form sheets of paper.

**pH** In chemistry, pH is a measure of the concentration of hydrogen ions in a solution, which is a measure of acidity or alkalinity. The pH scale runs from 0 to 14 and each number indicates a ten-fold increase. Seven is pH neutral; numbers below 7 indicate increasing acidity, with 1 being most acid. Numbers above 7 indicate increasing alkalinity with 14 being the most alkaline. Paper with a pH below 5 is considered highly acidic. Buffered papers typically have a pH between 8.5 and 9.5

**SIZE OR SIZING** The process by which gelatin rosin, starch or other synthetic substance is added to paper to provide resistance to the absorption of moisture and eliminating ink feathering and bleed through. Sizing added to the beater or vat of pulp is known as internal sizing. After the sheet is formed, it may be either "surface sized" - painted or brushed on the surface, or "tub sized" - immersed in a bath.

**SULPHITE** Sulphite pulp is produced from the wood of coniferous trees. Wood chips are cooked in calcium bisulphate or sodium sulphite, and bleached, producing fairly long strong fibers. Since the end of the 1860's, until recent years, it has been the most widely used pulp in America. In fact, the term "sulphite" has become generic and is still accurately used to describe any paper made from wood in distinction from papers made from cotton or other fibers. Sulphite pulp is available in a range of grades up to pure alpha cellulose.

**WOVE PAPER** Papers which show no fine "laid" lines running through the sheet when held to the light.



## GLOSSARY

### Paper Terms & Descriptions

#### Acid-Free Paper

Paper manufactured to a pH reading of 6.5, 7 (neutral) or greater. Primarily used for permanent records and to protect materials such as limited edition printing and fine art prints which could be harmed by contact with an acidic environment.

#### Air-Drying

The method of drying without the use of heated calenders. (Rollers)

#### Basic Size

Sizes based on trade customs which represent the industry standard for a specific paper grade. For example, the basic size of watercolor paper is 22" x 30".

#### Basis Weight

In the United States paper quantities are weighed by Basis Weight - the weight in pounds of a ream (500 sheets) of paper in a given "standard" or "Basic" size. Standard size is determined by the type of paper. For every grade or type of paper, the higher the basis weight, the thicker the sheet. It is important to remember, however, that this rule does not hold true when comparing different grades or types to each other.

#### Brightness

The amount of light (by measurement) reflected by a white paper.

#### Bristol

This term is used for pasting of paper to form a multi-ply sheet. Thus, 2 ply Bristol consists of two single-ply sheets bonded together. Bristols are made in a variety of finishes.

#### Buffering

The incorporation of an alkaline substance (usually calcium carbonate or magnesium carbonate) into the paper to act as a buffer against atmospheric pollution.

#### Calendering

A process that takes place at the end of the papermaking machine. The paper is passed through a stack of steel rollers which gives it a more uniform thickness (caliper). By varying the number of rollers used, and the pressure applied, degrees of smoothness can be achieved.

#### Coated

Papers coated with clay or pigment & adhesives mixtures (or some other suitable material) to improve the finish for printing quality, color, smoothness, opacity, or other surface properties. Lacquered & varnished papers are frequently called "coated".

#### Cold Pressed (CP)

A term used to describe the intermediate surface (medium) between rough and hot pressed produced by the pressing of certain textured papers used for watercolor work between cold cylinders. Cold Pressed boards and papers are rougher and more absorbent than their Hot Press counterparts. Also called "Kid" or "Vellum" finish.

#### Color

The hue of a paper, resulting from the amount of bleaching of the original pulp and the dyes and fillers added to the pulp. Papers are made in a full spectrum of colors, and even white sheets can be described in terms of color variations which range from blue-whites to creams to pinkish tones.

#### Conservation

The repair, restoration and preservation of paper object with a view to conserve them permanently.

#### Corner Stamp

The mark of the maker, unobtrusively blind-embossed (without ink) at the corner of a sheet of fine artist's paper.

#### Cotton Fiber Papers

Pulp made of cellulose fibers taken from cotton is used to make papers with cotton fiber content. Cotton fibers tend to be longer than those which come from wood; this creates a stronger bond when the fibers interlock in the papermaking process. Cotton fibers also carry no natural resinous impurities as in wood fiber. This creates better permanence, making the sheet more resistant to brightness or color shifts upon aging. Therefore, cotton fiber papers are usually called upon whenever durability and permanence are required (Papers made with cotton fibers, whether these come from rags, cotton linters or a combination of the two, are often called "rag papers").

#### Deckle Edge

A feathered or ragged edge produced during the paper-making process. The result of the natural way handmade paper is formed. Also, the result of sheet being torn in their wet state along water lines. Only handmade papers have four genuine deckles, but it is possible to produce artificial deckles on machine made and mouldmade papers to make sheets with four feathered edges.

#### Drawing

Paper with slight roughness (tooth) that will hold pencil, pen and ink, charcoal, pastel, calligraphy and mediums.

#### Esparto

A North African grass providing a soft-fibered sheet.

#### Feel

A subjective term used to express the impression a person obtains in handling a sheet of paper to judge its weight, finish and general qualities.

#### Felt Finish

A surface characteristic of paper created at the wet end of a paper machine by using specially woven wool and synthetic fiber blankets (called felts) with distinctive patterns. The pattern is gently imparted onto the paper leaving a unique surface with tooth.

#### Finish

The nature of the paper's surface. Finish is the condition of the surface of a sheet of paper; it is a descriptive characteristic. Technically, it is the result of work done on the surface after the sheet has been formed.

#### Fluorescent Papers

Papers which offer a high degree of whiteness or brilliance. Fluorescent dyes are used to make paper appear brighter by improving their light reflecting characteristics.

#### Formation

The characteristic arrangement of the interwoven and matted paper fibers in the body of the sheet. It is judged to be uniform or cloudy by looking through the body of the sheet rather than looking at its faces.

#### Grain Direction

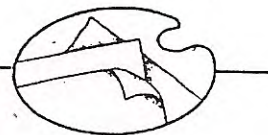
The direction in which the majority of fibers lie in a finished sheet of paper. Grain direction is produced by fibers aligning in the direction in which the paper runs on a fourdrinier machine. Grain direction is unrelated to the surface texture (grain) of the paper. Paper will crease sharply and cleanly when folded on the grain. Handmade papers have no grain and while grain exists on mouldmade papers, it is almost imperceptible.

#### GRS/m2

Weight of paper in the metric system; weight of one square meter expressed in grams.

#### Handmade

Made sheet by sheet on a hand mould either of the Western (ridid) variety or the Oriental (flexible) variety.



## GLOSSARY

### *Paper Terms & Descriptions, cont.*

#### Hard

A term often used to describe slick finish but which actually indicated a high degree of water resistance imparted by sizing.

#### Hot Pressed (HP)

Used primarily in describing watercolor papers with a very smooth surface, nonporous, glazed surface produced by pressing the paper between hot cylinders. Also called "Plate" or "High" finish.

#### Laid Finish

Describes a watermarked series of parallel, horizontal impressed lines in a sheet of paper combining chain (wide spaced) lines and laid (closely spaced) lines at right angles to each other. Produced by the wire on which paper is made.

#### Machine Made

Made by Fourdrinier paper machine.

#### Mouldmade

Made by mould machine, by the slow rotation of a cylinder mould.

#### M-Weight

This is another measure of paper weight: It measures the weight of 1000 sheets of paper. Thus, 1000 sheets of the basic size of 17" x 22", 20lbs. or 40M.

#### Opacity

The property of a paper that diminishes the passage of light through the sheet.

#### Parchment Finish

True parchment is a writing sheet with vellum qualities made from the skins of animals. Today, parchment describes a sheet made to simulate the appearance of true parchment.

#### pH

This is a chemical term, defining the acid-alkaline range of any substance. A lower pH indicates acidity, a higher figure shows an alkaline condition. A pH reading of 7.0 indicates neutrality. Most of the neutral papers have a pH of over 6.5 and many are 7 and above. It is impossible to give accurate figures because each making of paper can yield a slightly different pH value; papers also acquire acidity, thus a lower pH, by frequent handling (fingerprints, storage conditions, atmospheric conditions, etc.). Please inquire about specific pH values whenever this information is essential.

#### Plate Surface/High Surface

For a special, uniformly smooth finish, sheets of paper are interleaved with highly polished metal plates to make a stake, or "book". The book is then pressed repeatedly between steel rollers under great pressure, imparting the smoothness of the metal plate to the paper's surface.

#### Ply

A single thickness (sheet) of paper. This term is most often used when several sheets (plies) are bonded together to form a board. Artists papers and mounting boards, as well as other grades, are identified as 1-ply, 2-ply, etc. As each ply is pasted together the increased thickness and stiffness is described by the number of plies.

#### Printing

The actual process of offset, letterpress, engraving, photo-gravure, etc. of papers manufactured specifically for those printing processes, of cut to size for printing processes, especially cut to offset size. Japanese papers in general are not sized for offset printing. Yet, several papers have been printed successfully on offset by skilled craftsmen. The caveat about "not recommended for offset" appears only of grades where no offset printing experience is available, but the other Japanese papers are not guaranteed for offset either, except where specifically mentioned. When in doubt, testing the paper is recommended.

#### Printmaking

Hand lithography, etching, serigraphy (silkscreen) woodcut, wood engraving, block-printing, etc.

#### Quire

A standard pack of unbound paper: 25 sheets = 1 quire.

#### Rag

Fibers of non-wood origin: actual old rags, cotton linters, cotton or linen pulp, manila hemp.

#### Ream

A standard pack of unbound paper: 500 sheets = 1 ream.

#### Rough Surface (R)

A term used to describe a coarse, grainy textured paper. Often used by artists when discussing the surface characteristics of watercolor paper.

#### Sizing

The addition of gelatine, animal glue or synthetic material to control the amount of absorption of ink or paint.

#### Sulphite Pulp

Refers to the finest available grade of wood-derived sulphite pulp, often pure high alpha pulp used in sketch, drawing and newsprint.

#### Supercalendering

For a shiny smooth surface (called a supercalendered finish), paper is passed through a stack of rollers consisting of alternating rolls of cold steel and other faced with fiber.

#### Surface

The exterior of the paper consisting of its top and bottom faces. Surface is not a characteristic; it is a thing. The artist works on a paper's surface, but not on its finish or formation.

#### Texture

The surface appearance of paper. Also called "finish".

#### Tooth

A slight roughness in the paper's finish which readily accepts such media as ink, pastels, pencil and charcoal.

#### Vellum Surface/Medium Surface/Regular Surface

A term used to describe the finish of a sheet of paper, with a minimum to moderate tooth.

#### Watercolor

Paper designed to hold up under an aqueous based paint.

#### Watermark

A design or lettering produced by varying the fiber density during the paper-making process, usually by use of raised wires sewn onto a mould.