



Background: Tools, Equipment and Materials— Art/Design

A variety of special tools, equipment and materials are used in Art/Design and Communication that are often expensive and require special care. School supplies may be shared among many students; every student is responsible for making sure supplies are handled carefully, stored properly and not wasted.

Craftspeople and artists create objects and designs by using a variety of tools, equipment and materials in creative ways. Materials come in a huge range of colours, textures, strengths, flexibility levels, costs and availability levels. Some materials require the use of specific tools and equipment in order to work with them.

Dry Materials for Making Marks

- pencils
- pencil crayons
- charcoal
- Conté crayons
- chalk, chalk pastels, oil pastels
- wax crayons

Wet Materials for Making Marks

- ink, India ink
- ballpoint pens, felt pens, markers
- paints (acrylic, water colour, tempera, poster, oil)

Tools Used to Apply Wet and Dry Materials

- pens/brushes
- stumps/tortillons
- rollers
- airbrush
- palette knife
- found objects

Materials Used as Surfaces on Which to Make Marks

- paper
- glass
- fabric
- plastic
- metal
- wood
- drafting table

Tools and Equipment for Working with Wet and Dry Materials

- easel
- drawing board
- T-square
- palette

Tools, Equipment and Materials Used for Sculpture and 3-D Products

- clay
- plaster
- metals
- wood
- glass
- fabrics
- plastics
- sand
- papers

Computer and Digital Equipment for Capturing, Creating, Manipulating and Displaying Images

- computers
- graphics software
- LCD projectors

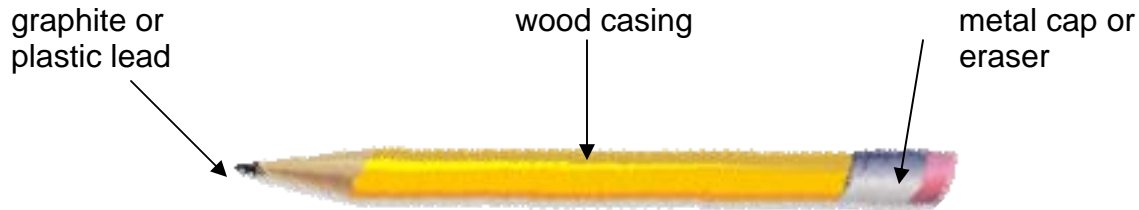
Dry Materials for Making Marks

Dry materials, e.g., pencils and charcoal, can be used separately or in various combinations. Mixing media often produces richer surfaces and more complex drawings. Try using several dry media together or using wet and dry together.

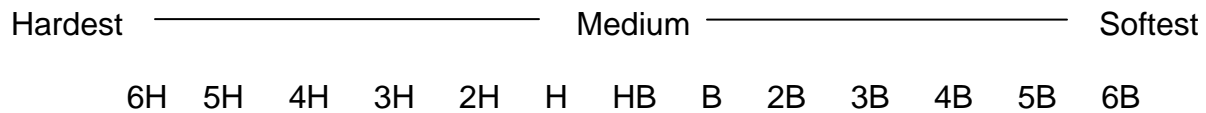


Pencils

Pencils are made of a graphite or plastic lead stick, surrounded by a wood casing.



Graphite or plastic lead varies in density from hard to medium to soft.



Soft pencils are graded with the letter B and numbered from B to 6B. The larger the number before the B, the softer the pencil material. Soft leads are often used for sketching and shading because they are generally darker and easier to manipulate.

Hard pencils are graded with the letter H and numbered from H to 6H. The larger the number before the H, the harder the pencil material. The hardest leads are used to create sharp, clear lines; e.g., those in drafting or architectural drawings.

Pencil Crayons

Coloured pencils may be used to draw fine, coloured lines or to shade areas in colour. A variety of coloured pencils are available and the craftsperson or artist can be creative in mixing and matching different colours, blending two or more colours or using coloured pencils with other drawing or painting materials.



Charcoal

Charcoal is the oldest drawing tool. It is a dry and dusty medium made from burnt wood. Have you even drawn with a stick that had been blackened from a fire? This is charcoal.

Charcoal for craft and art purposes is found in many forms; e.g., pencil, compressed sticks or natural sticks. A variety of values and hardness produce different effects.



Conté

Conté is a highly compressed form of chalk. Conté crayons, pencils or sticks come in various densities, from hard to soft. Colours are always earth tones; i.e., white, black, browns, greys, rust.



Chalk, Chalk Pastels, Oil Pastels



Oil pastels are a form of chalk that has been compressed with oil. All chalks and oil pastels come in a wide range of colours. A variety of soft, blended effects can be obtained by layering several colours and using brushes, cloth or paper to blend.

Wet Materials for Making Marks

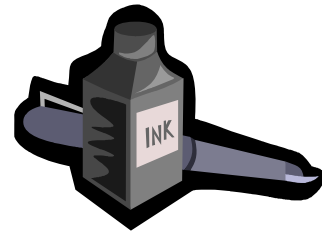
Wet materials, e.g., ink and paint, can be used separately or in various combinations. Mixing media often produces richer surfaces and more complex drawings. Try using several wet media together or using wet and dry together.

Felt Pens and Markers

Felt pens or markers are excellent for layout and design and can be used in some poster work. They come in a wide range of colours and line thicknesses. They have the disadvantage of being transparent and are difficult to use when large, flat areas of colour are needed.

Ink and India Ink

India ink is a simple black ink commonly used for drawing, especially comics and comic strips. Other inks are found in a variety of colours. All inks can be used full strength or diluted for wash drawings. A variety of tools are used to apply ink; e.g., nib pens, fountain pens, brushes, feathers, rollers and sticks and twigs.



Paints

Many different types of paint each have specific properties. Artists may choose a particular type of paint based on the colours and effects it produces, its drying time, the painting surface they want to use and other factors.



Paint Type	Description	Advantages	Disadvantages
Acrylics	<ul style="list-style-type: none"> • water-based • when undiluted, create rich colours like oil paint • when thinned with water, create soft effects like watercolours • available in tubes, bottles, large containers or cans 	<ul style="list-style-type: none"> • dry quickly and permanently into a water-resistant, flexible, plastic-like finish • can create transparent or opaque colours by varying the amount of water added • brushes and tools can be cleaned with warm water 	<ul style="list-style-type: none"> • very fast drying time may make it harder to mix colours • dried paint on brushes or clothes is difficult to remove • may require several coats to achieve the desired colours
Water Colours	<ul style="list-style-type: none"> • quick drying, transparent medium • come in a wide variety of colours • can be opaque or transparent, depending on how much water is added • allow the colour and texture of the painting surface to show through • available in tablets or tubes 	<ul style="list-style-type: none"> • can be used freely • can create soft designs and colour tones, while also allowing for detail • can create opaque, translucent and transparent colours • dried paint can be reused by adding water • brushes and tools can be cleaned easily with water 	<ul style="list-style-type: none"> • fast drying time • can leave “tide marks” (dark edges around dried areas of diluted watercolour—some artists use this effect while others avoid it)
Oils	<ul style="list-style-type: none"> • produce rich colours • can create lighter or softer colours when mixed with special solvents • available in tubes 	<ul style="list-style-type: none"> • easy blending of colours • easy to cover errors 	<ul style="list-style-type: none"> • take a long time to dry • require the use of chemical solvents for thinning paints and for clean up

Paint Type	Description	Advantages	Disadvantages
Tempera/ Poster Paints	<ul style="list-style-type: none"> • water-based • can be bright and opaque or softer, depending on how much water is added • available in powder or premixed liquid paints 	<ul style="list-style-type: none"> • can produce very bright, vibrant colours and effects • brushes and tools can be cleaned easily with water 	<ul style="list-style-type: none"> • take practice to effectively mix or soften colours
Sign Paint	<ul style="list-style-type: none"> • usually oil-based • used on cloth for banners and signs that are usually displayed outdoors 	<ul style="list-style-type: none"> • good quality paints • weatherproof • opaque for solid colour coverage 	<ul style="list-style-type: none"> • require special chemicals for thinning and clean up • often expensive

Tools Used to Apply Wet and Dry Materials

Many different tools are used to make marks with various materials and media. Using a variety of common tools as well as interesting and unique found objects can enhance creativity and lead to new effects.

Tools

- ballpoint pens
- felt-tipped pens
- fountain pens
- lettering pens
- technical pens
- nib pens
- brushes
- feathers
- sticks and twigs
- cardboard pieces
- other found objects



Pens

Ballpoint pens are the regular ink pens that we normally use for day-to-day writing. Ballpoint pens are used for drawing and shading, but care must be taken to control the pressure used. Too much pressure may result in an unwanted blob of ink on the drawing surface.



Felt-tipped pens are commonly used by artists. A wide range of colours is available and the artist can blend colours to create different effects. By controlling the pressure used, the artist can create shading and hard or soft lines.



Fountain pens and lettering pens are used for general drawing, sketching or calligraphy. Fountain pens contain a reservoir of ink that must be replaced or refilled periodically. Lettering pens are used with a bottle of ink—the artist dips the pen nib into the ink whenever necessary.



Technical pens are similar to fountain pens. They have a tube-like, hard nib that can be used both for sketching and for producing detailed drawings. Technical pens are available in a variety of line widths and have refillable or replaceable reservoirs.

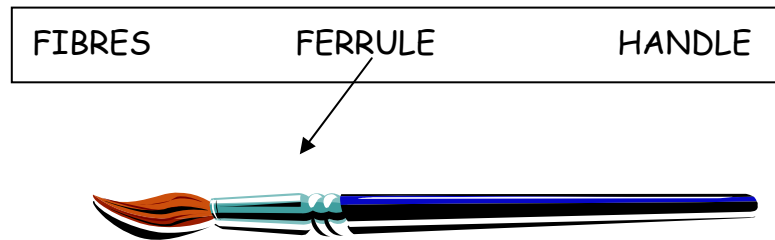


Nibs for pens come in various sizes and shapes, from small and thin to wide and flat. The nib can be filled by dipping about one half of the point into a bottle of ink, or the ink can be applied to the nib with a liquid dropper.

Brushes

Good paintbrushes can be the artist's and craftsperson's most important tools. Some paintbrushes are made by hand and are very expensive. Knowing how to use and care for paintbrushes will result in better painting and more effective use of tools and supplies.

Brushes come in a wide variety of materials, shapes and sizes. They are made of a fibrous tip, connector called a ferrule and wooden or plastic handle.



The fibres of a paintbrush may be made of hair, bristle or synthetic material. A brush is judged by how well it can retain paint and hold colour.

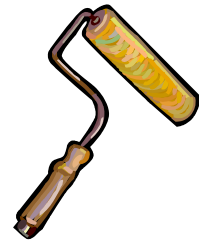
- Animal hair fibres have tiny scales that hold water and paint. Each hair has a tapered shape which makes for a better tip. Sable is considered to be the best natural hair paintbrush. Other paintbrushes use hair from oxen, squirrels, goats, horses, camels and skunks.
- Natural bristle fibres are made of soft or stiff animal hair. Hog bristle is commonly used.
- Synthetic fibres are man-made hairs, often made out of nylon. These paintbrushes are cheaper, more durable and easier to clean but may not be ideal for all kinds of paint.

The ferrule is the metal or plastic part of the paintbrush that holds the fibres and connects them with the handle. Most ferrules are nickel-plated to prevent rust. The size of a paintbrush is measured based on the width of its flattened ferrule.

The handle is usually made of kiln-dried wood but may be made from moulded plastic. Wood expands when wet and shrinks when dry. Wooden handled paintbrushes, therefore, should not be left soaking in either water or solvent when not in use.

Rollers

Large paint and small printing rollers (brayers) are used for commercial purposes and to make marks for artistic purposes.



Stomps and Tortillons

Stomps and tortillons are sticks used for blending charcoal, Conté crayons, oil pastels and chalk.

They are usually made of paper that has been wrapped or twisted into the shape of a pencil or a stick.



Q-tips, wadded pieces of tissue or paper can also be used.



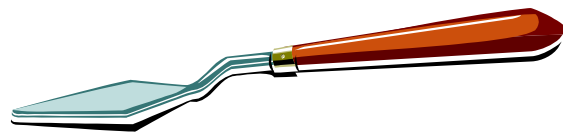
Airbrush

An airbrush is an artist's tool used for spraying paint by means of compressed air. Proper ventilation in the working area and appropriate breathing masks must be worn when using an airbrush.



Palette Knife

A palette knife is used both to mix oil and acrylic paints and to apply paints to a painting surface.



Found Objects

A wide variety of found objects can be used to apply materials to make marks. Look for unique or unusual man-made and natural objects.



Surfaces on Which to Make Marks

Almost any type of wet or dry material can be used as a painting or drawing surface, depending on the material and the agent used to thin the paint or cleanse a painted surface. Most surfaces need a special coating of paint or primer to prevent oil paint from seeping into the surface material.



Surface	Material	Wash and Thinner
Paper or Card	<ul style="list-style-type: none"> • acrylic paint • felt marker • watercolour • poster paint • all dry materials 	<ul style="list-style-type: none"> • water
Metal	<ul style="list-style-type: none"> • sign painter's oil-based colours 	<ul style="list-style-type: none"> • mineral spirits (paint thinner or turpentine)
Wood	<ul style="list-style-type: none"> • sign painter's oil-based colours • acrylic 	<ul style="list-style-type: none"> • mineral spirits • water
Glass	<ul style="list-style-type: none"> • sign painter's oil-based colours 	<ul style="list-style-type: none"> • mineral spirits
Cloth	<ul style="list-style-type: none"> • sign painter's oil-based colours • acrylic 	<ul style="list-style-type: none"> • mineral spirits • water
Oil Cloth	<ul style="list-style-type: none"> • sign painter's oil-based colours 	<ul style="list-style-type: none"> • mineral spirits

Safety Note: Oil-based paints, thinners and cleaners must be used only in a well-ventilated area, under the direct supervision of a teacher/supervisor.

Paper

Paper is an important material for craftspeople and artists. Different types of paper; e.g., weight, surface, colour, create different artistic effects. Understanding how paper is made and its different properties allows artists to choose appropriate paper types and to create new designs using a variety of media.

Paper Weight Craftspeople and artists must consider the thickness or weight of the paper. Paper is weighed based on a ream, is a bundle of 500, 65 cm x 72 cm sheets. If the ream weighs 65 kg, we know that each of the 500 sheets is fairly thick and heavy. If the ream weighs 35 kg, each sheet is thinner.

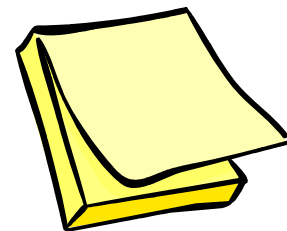
Paper Surface Each type of paper has a different texture and appearance. A pencil or charcoal drawing created on paper with a rough surface would look somewhat different from the same drawing created on smooth paper.

Paper Colour Some types of paper come in only one colour while others come in a wide range. Depending on the wet or dry material used, the colour of the paper will show through to different extents.

Originally, all paper was made by hand by mixing rags or cotton fibres with water into a pulp. During the Industrial Revolution, machines were invented to mix the pulp and make paper in longer lengths. Fibres from bamboo, sugar cane, hemp and flax replaced cotton rags. Today, most paper is made from wood pulp as it is the cheapest and most available resource for papermaking. This pulp is washed, screened and bleached to remove impurities and make the product whiter.

Rag paper is still considered the best surface for painting with water colours. It lasts longer and stays whiter than cheaper grades of paper made from wood pulp. In modern papermaking, various ingredients may be added.

- Alum is used to settle out impurities but may add too much acid for good art paper.
- Fillers are used to create different surfaces on paper.
- Dye is used to create different coloured papers.
- Sizing uses such substances such starch or gelatine to add body to paper and make it water repellent. Sizing may be added in the pulp or to the paper's surface).



Through learning and practical experience, artists and craftspeople are able to determine the most suitable paper or card to use for each design.

Paper Type	Construction and Use
Construction	<ul style="list-style-type: none"> • Matte finish, 80 lb paper that is inexpensive and available in a wide colour selection. • Used with crayons, paint, pastels and charcoal. • Good for paper folding but has limited durability. • It is not acid free.
Cartridge	<ul style="list-style-type: none"> • Cream or white 110 lb paper that is available in a variety of textures. • It is an inexpensive, general purpose paper, most widely used for drawing.
Manila	<ul style="list-style-type: none"> • Medium-to-heavy toothed weight, 50lb to 100 lb paper. • It is used with pastels, chalk or watercolours.
Newsprint	<ul style="list-style-type: none"> • Lightweight, light brown or grey in colour, this paper tears easily. • It is very inexpensive and commonly used for papier-mâché, preliminary sketchbooks and dry media. • It is also used as protective cover sheets.
Velour	<ul style="list-style-type: none"> • Medium-weight, flocked paper that is used with pastels and for special effects.
Oatmeal	<ul style="list-style-type: none"> • Cream-coloured, rough-textured 40 lb paper. • It is often used for effects.
Kraft	<ul style="list-style-type: none"> • Medium weight, brown coloured, strong paper, also called butcher paper that is very inexpensive, good for experimental work and wrapping and covering drawings or paintings.
Watercolour	<ul style="list-style-type: none"> • Very white, 90 lb to 240 lb paper comes in a variety of surfaces and is often rough. • It is used with wet finishes and is expensive but durable. • It is often stretched.
Tissue Paper	<ul style="list-style-type: none"> • Thin, translucent, high quality paper that is available in a wide range of colours. • It is used for collage, papier-mâché and special effects.
Ingres	<ul style="list-style-type: none"> • Lightweight and soft paper that is available in white and a wide range of colours. • It has a slightly textured surface that is ideal for charcoal, pastels, Conté and ink work.

Board

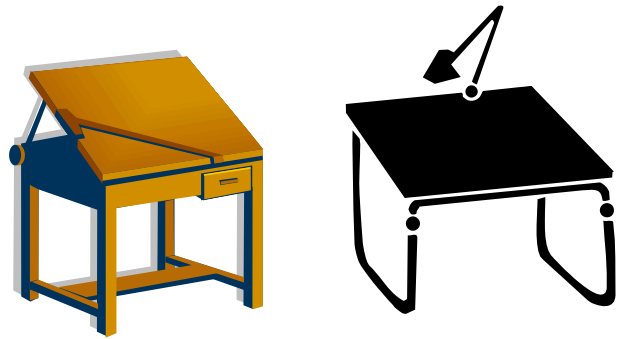
Board is very heavy, stiff paper. Board weight is described by the number of plies (thin layers) that make up the board.

Board Type	Construction and Use
Bristol	<ul style="list-style-type: none">• This board has a light-to-heavy thickness with 100 percent rag content.• It is smooth on one side and slightly pebbled on the other.• It may be used with inks, watercolours and felts.
Poster	<ul style="list-style-type: none">• This board has a medium-to-heavy thickness and is composed of 4 to 10 plies.• It is clay-coated, coloured and has a smooth-to-satin finish.• It may be used for silk screening and show card work.
Railroad	<ul style="list-style-type: none">• This heavy, 6-ply board is coloured on both sides.• It may be used with most paints and inks.
Illustration	<ul style="list-style-type: none">• This 14- to 25-ply board has a rag content, lies flat and is available in three colours; i.e., white, grey and black.• It may be used with all illustration techniques; i.e., brush, pen, sponge or airbrush.
Mayfair	<ul style="list-style-type: none">• This light, 2-ply board has a multicoloured, matte finish.• It is good for mounting illustrations and general purpose artwork.
Mat	<ul style="list-style-type: none">• This heavy, solid board is covered with a paper mat.• It may be textured or smooth.• It may be acid free.• It is available in several colours and has an all-wood pulp backing.
Conservation	<ul style="list-style-type: none">• This non-rag, acid-free board has a solid colour core.• Its surface can be sanded and it is available in a variety of colours.

Other Painting and Drawing Equipment

Drafting Table

Drafting tables or art tables have a top that can be lifted up or tilted to various angles. This allows the artist's eye level to be more directly in line with the working surface.



Easel

Artist's easels are standing frames that are used to support artwork. A combination of both desk and floor easels are helpful in the classroom.



Drawing Board

Any flat, square-edged surface can be used as a drawing board. The best boards are made of white pine with carefully squared corners and edges. Boards come in various sizes. A 50 cm x 65 cm board is a good general-sized surface.



T-square

A T-square is made of wood and plastic or metal. It has a head that butts against the edge of the drawing board and a blade that rests across the drawing board at 90 degrees to the head.



Palette

A palette is used as a holding and mixing surface for paints. The artist may use a hand-held palette or a simple plastic or porcelain plate on which to blend paints.



Tools, Equipment and Materials for Sculpture and 3-D Products

Many artists and craftspeople work in 3-D media, creating sculptures, carvings and mixed-media compositions of all kinds.

Sculpture and 3-D Materials

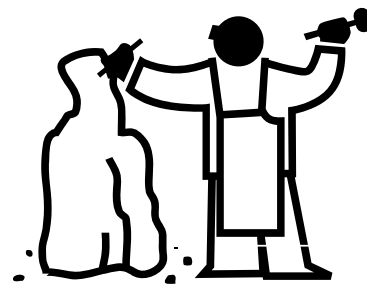
Any material or combination of materials can be used to create 3-D products; e.g.,

- clay
- stone
- wood
- wire
- paper
- cement
- plaster
- metal
- alloy
- papier-mâché.



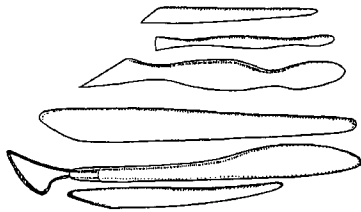
Materials can be shaped or attached in various ways. Materials can be:

- sewn
- glued
- modelled
- bolted
- welded
- chiselled
- riveted
- hammered
- stamped
- fastened
- moulded.



In some cases, specialized tools are needed.

Clay Modelling Tools



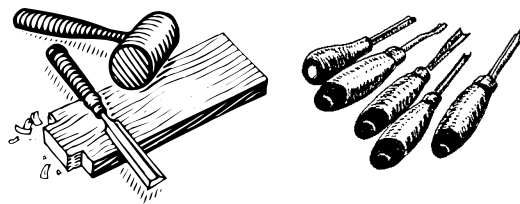
Clay Kiln



Carving Tools



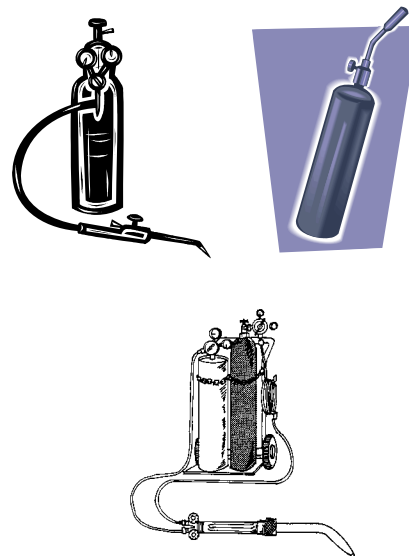
Wood Carving Tools



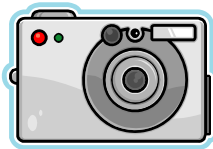
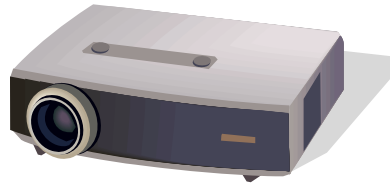
Construction Tools



Welding and Metal Tools



Computers and Digital Equipment



As technology continues to change and access improves, students and artists have more opportunities to use computers and digital equipment and software. Various equipment and technologies may be incorporated when appropriate for capturing, creating, manipulating and displaying images.