Clay

Clay is a naturally occurring material composed primarily of fine-grained minerals, which acquire plasticity through a variable range of water content, which will harden when dried and/or fired. More simply, clay is a heavy, damp material that ‘sets’ upon drying and can be changed by heat into a hard, waterproof material.

Ceramic (from the Greek Keremos meaning burnt clay) can be defined as ‘something made of material produced by the high temperature firing of inorganic, non-metallic rocks and minerals (including refractory products)’. Pottery can be defined as ‘fired wares formed of clay for domestic use’. There are many different types of clay that can be used for making vessels and ceramic sculpture. Types of clay, whether naturally occurring or made to a recipe, are distinguished by differences in chemical composition; this dictates their properties with regard to colour, strength, texture and firing temperature. The following are three of the most common:

Porcelain is high-fired, smooth, durable, strong, usually white, non-porous, vitrified and, if thin enough, translucent. It can be thrown, cast and used for modelling.

Stoneware is a hard, strong vitrified ware, fired above 1200˚C. The body and glaze mature at the same time which forms an integrated layer and allows for many possibilities in the glazing.

Earthenware, also known as terracotta (which translates as ‘fired earth’) is a porous body which becomes watertight through the addition of a layer of glaze rather than the firing temperature. In its unglazed state, earthenware is used to make flowerpots, bricks and floor tiles. A simple distinction between earthenware and stoneware is through porosity. If the fired body has a porosity of more than 5%, it is earthenware. Most potters, however, would distinguish the two by firing temperature; under 1200˚C; earthenware, over 1200˚C; stoneware.

Clay is extremely malleable and can, through a series of processes, be fashioned into almost anything from robust bricks to delicate vessels.

Clay vessels or sculptures can be thrown on a wheel, cast, moulded, coiled or made from rolled slabs or made with a combination of techniques. Generally speaking, the function of the finished object will dictate the choice of clay and the process used for the making. A teapot, for example, will be lighter and more ‘fit-for-purpose’ if it is made of smooth, high-fired clay rather than gritty, brick clay. Similarly, although technically possible, building a house from porcelain would be impractical in terms of technical difficulties and the cost of production.
Metal

When human beings moved out of the Stone Age and into the Bronze and then Iron Age, life was transformed in many ways. Significantly, we began to make metal tools which allowed us huge scope for transforming other materials. Hammering, gouging and sawing tools enabled the making of increasingly sophisticated items. The systematic production and use of iron implements, including weapons, began around 2000 BC in Anatolia (now Turkey).

It is likely that gold was the first metal to have been worked by human hand as it occurs as nuggets or grains in rocks and in alluvial deposits. Gold in antiquity was relatively easy to obtain geologically and it is the most malleable and ductile metal known. To obtain other metals, the relationship between heat and the extraction of metal from ore needed to be understood. As skills related to extracting metal ores from the earth began to evolve, metalsmiths became more knowledgeable and therefore important members of society. Fates and economies of entire civilizations were greatly affected by the availability of metals and metalsmiths.

Metals have certain characteristic physical properties: they are usually shiny and lustrous, have a high density, are ductile (capable of being drawn out into wire), tough and malleable, usually have a high melting point, and are (mainly) hard and conduct electricity and heat well. Metals are also sonorous, which means that they conduct sound well.

Silver is a soft, white lustrous metal. It has the highest electrical and thermal conductivity of any metal and occurs in minerals and in free form. It is used in coins, jewellery, tableware and mirrors. Silver is chosen for its beauty in the manufacture of jewellery and silverware, traditionally made from a silver alloy (sterling silver), which is 92.5% silver. The other part is usually copper which adds strength as pure silver is too soft for functional items.

Metals can be engraved, etched, gilded, inlaid, milled, planished, polished, punched, soldered, welded, cast and forged. Smelting, principally used for iron ore, is the process used to extract metal from ore.

Metals are categorised as either base, ferrous or precious. Base metals such as iron, copper and nickel will corrode and oxidise, whereas precious metals are resistant to corrosion and oxidation. Ferrous metals such as steel contain iron; steel and iron are the metals of choice for forging tools and larger scale items such as gates. A jeweller is more likely to opt for gold and silver. The aesthetic qualities of precious metals, their malleability and, to an extent, tradition, mean that these are the preferred choice for human ornamentation and fine tableware.

As well as sculpture, craft, art works and jewellery, metals are used in thousands of products including transportation, electronic devices, household goods, construction, biomedical applications, electrical power production and distribution and agriculture.

Images: 1. 10 tola gold bar. 2. Devon Guild Member Mike Tingle punching copper. 3. Gold and silver bulb by Devon Guild Member Wayne Meeten.
Print

Printing is the term used to describe a mechanical process of transferring text or images onto paper, fabric or any other printable surface. This makes it sound simple but, given that there are numerous processes, many types of paper, fabric etc., and many types of ink, a printmaker, of any sort, needs a good understanding of process and materials. This is possibly the reason that printmaking is sometimes described as a ‘craft’ rather than ‘art’.

Etching, mezzotint and drypoint are together known as ‘intaglio’ processes. Intaglio methods rely on a metal plate onto which the image is scratched or etched. Ink is then forced into the scratches and the plate, with paper on top of it, is put through the press under pressure so the paper absorbs the ink.

Lino cut, woodblock and collagraph are all types of ‘relief’ printing where the surrounding area is cut away, leaving the surface to be printed as raised or in relief. The inky surface is then transferred to paper under pressure.

Screenprinting, most usually a technique used for transferring ink onto fabric, is achieved by forcing the dye through unblocked sections of a mesh, stretched tightly across a frame, with a squeegee.

Monoprinting, sometimes called ‘monotype’ is a print taken from an inked surface. Monoprint, as the name implies, results in a one-off print whereas intaglio and relief printing are processes which can produce ‘editions’ of prints. Editions are still unique in that each print is put through the press on its own, an entirely different process to digital printing where unlimited, identical prints can be run off at the touch of a button. These are sometimes known as Giclée prints, fine, photographic prints produced on an inkjet printer using archival quality inks.

The printer’s palette may be made up of pigment based or dye-based inks. Pigments are finely ground substances which, when mixed with liquid, do not dissolve. Most mineral pigments are stable in that they won’t fade or degrade over time. Dyes, unlike pigment, will dissolve when mixed with liquid. Synthetic dyes are mostly derived from petroleum, with ‘natural’ dyes made from vegetable or animal sources. Dyes are more suited to textiles as the liquid penetrates and bonds chemically with the fibre.

Images: 1. 1830 Albion Relief Press. 2. Devon Guild Member Caroline Hall screenprinting. 3. The printer’s palette, a range of colours chosen by the printmaker for a particular work.
Textiles
Textile fibres can be made from many sources. Animal based fibres include fur, wool and insect cocoons (silk). Plant based fibres include hemp, flax, cotton and coconut as well as some woods. Synthetic fibres mostly come from petrochemicals, nylon and polyester for example, while semi-synthetic fibres may have a plant-based source but have been extensively modified by chemical processes. Rayon is an example of a semi-synthetic fibre.

Wool from goats, sheep, alpacas and llamas can be felted or spun and then woven; it gives us cashmere, mohair and angora as well as numerous other varieties of sheep wool suitable for different purposes. Yarn, or thread, is formed by spinning the raw fibres of wool, flax, cotton or other fibres to produce long strands. These strands can then be made into network of natural or artificial fibres creating a flexible material known as textile. Textile refers to any material made of interlaced fibres and fabric refers to materials made through weaving, knitting, spreading (felting), crocheting or otherwise bonding which may then be used to make further products. Cloth is synonymous with fabric but often refers to a finished piece of cloth.

The word fabric comes from the Latin fabrica for workshop, an art, trade or skilful production or faber, ‘artisan who works in hard materials’.

Weaving is a textile production method which interlaces a set of long threads (the warp) with a set of crossing threads (the weft). This is done on a frame, or machine, known as a loom. The industrial revolution transformed the textile industry but mainly in the areas of scale and speed of production. For the main types of woven textiles, plain weave, twill and satin weave, there is little difference between ancient and modern products.

Many fine twentieth century artists added textile to the materials they worked with including Alexander Calder, Marc Chagall, Salvador Dalí, Sonia Delaunay, Raoul Dufy, Barbara Hepworth, Fernand Léger, Henri Matisse, Joan Miró, Henry Moore, Pablo Picasso, Ben Nicholson and Andy Warhol thereby using textile as a fine art medium in addition to its thousands of functions as a utilitarian and decorative material. Textile arts include dyeing and printing, embroidery, tapestry and lacemaking alongside construction methods such as sewing, knitting, crochet, and tailoring.

Images: 1. Devon Guild Member Liz Clay carding wool in preparation for felting. 2. A small textile store in Yemen. 3. A weaver’s loom. 4. Devon Guild Member Sam Pickard putting the finishing touches to a table runner.
Wood

Trees have provided humans with fuel, food, shelter and transport ever since we evolved. A climate that favours the growth of trees is a climate which favours us. So what is a tree? It’s a plant which has evolved a tough, woody stem which allows it to grow tall and into the light. Happily for us, this tough, woody stem can be used for thousands of practical purposes as well being essential to plant and animal biodiversity.

There are three main groups of tree: broadleaves, conifers and palms. Close to home we have a variety of broadleaved trees which include oak, beech, maple, chestnut and ash. Broadleaved trees are mainly ‘hardwood’ trees. Conifers, the ‘softwoods’, grow all over the world and include cypress, larch, spruce and numerous varieties of pine. Pines are mostly, but not exclusively, found in colder climates whereas palms are found mainly in the tropics.

Generally speaking, it is the hardwoods that will be used by cabinet makers to make fine furniture. Image 2 shows a store of hardwood, stacked and colour-coded so the maker knows how long the wood has been ‘seasoning’ (drying out) before being used. Different woods have different properties and there is a relationship between the density of a type of wood and its strength.

‘Woodwork’ is a general term that encompasses a huge range of skills and there are many types of carpentry from large-scale construction such as timber framing and roofing, through to cabinet making. ‘Joinery’, in its particular sense, refers to the joining of wood without the use of nails, screws or other metal fasteners.

Woodworking tools are numerous and specialised but they can be broadly categorised as either measuring and marking tools (gauges, levels, rulers etc), cutting tools (hand and power saws), shaping tools (planes, routers, chisels, lathes etc), assembly tools (screwdrivers, hammers, clamps and drills) and finishing tools (sanders, files and scrapers).

Timber is the term used to describe wood, either standing or processed for use. This ranges from the time trees are felled to their end product as a material suitable for industrial use, as structural material for construction or wood pulp for paper production.

Natural woodlands have been managed by people for thousands of years. Coppicing, the practice of cutting trees at ground level so lots of shoots are produced, and pollarding, lopping the tops off, are methods used to harvest a ‘crop’ of usable wood such as hazel poles (for making hurdles) or willow wands (for making baskets). Thinning is also a way of managing woodland: by removing certain trees, those that remain can have maximum light and space to grow to maturity. The thinnings are a useful crop of timber.

Image 3 shows a bowl being turned on an electric lathe; the spinning wood is shaped by holding various, sharp cutting tools against it.

Images: 1. Ancient oaks in Yarner Wood. 2. Devon Guild Honorary Fellow John Makepeace’s timber store. 3. Devon Guild Member Don White lathe turning.
**Glass**

Glass is one of the oldest synthetic materials and consists of silica, sodium carbonate, and lime. Other elements are added to this mixture for colouring purposes. Glass often begins in the form of a powder or sand that melts and fuses when heated. This sand is generally heated to a temperature of 1300°C, although the melting temperature of glass varies with its composition. Workable glass has a consistency similar to chewing gum but, by changing the temperature, the consistency can vary greatly.

Glass is considered a beautiful medium in which to work; however, it is very expensive. A typical glass workshop is expensive to establish and maintain. First, a kiln is required in which to heat the glass and then there is the cost of the glass itself. The extremely high temperature involved in melting glass requires the artist to have special tools for handling and shaping the hot glass. Due to the fragility of glass, cooling tubs or devices are also necessary. Once the glass is formed, the finished shapes must be cooled slowly so that cracks do not form.

There are many methods that artists use to shape the heated glass. Basic glass-making techniques can be divided into seven categories: glassblowing, lampwork, casting, kilnforming, cutting, surface techniques, and assemblage or fabrication.

Glassblowing is one of the more difficult techniques because it requires strength and precision. The hot glass is gathered on a hollow blowing rod and is manipulated while rotating and blowing air through the rod. This method generally allows the glass to be thinner and more evenly distributed than other methods. While blowing, the glass can be manipulated fairly easily using different shaping tools. Once the glass has been formed, it can be decorated using various finishing techniques.

Lampwork is the technique of heating glass rods or pieces by blow-torch or other isolated heat sources which then fuse together into shapes or objects. This method requires a much softer and more malleable type of glass because it is difficult to heat regular glass to high temperatures.

Casting involves the melting of glass materials into a mould or reshaped form. This can be done by pouring molten glass or heating cold glass in moulds to form shapes. The moulds can be made from clay, plaster, wax, wood, metal or anything else that will control the melting of the glass.

Kilnforming involves placing pieces of glass in a kiln and melting them into various shapes and designs. This method differs from casting in that the glass is allowed to melt freely, without the confines of a mould. Because the entire process takes place in the kiln, this method allows little control over the melting process and can result in some interesting shapes.

The cutting of crystal glass is performed after the glass has been formed and cooled. The best type of glass for this technique has a higher lead content and is therefore softer and easier to cut than regular glass and is particularly brilliant when cut.

Surface techniques are often used as a decorative finish for glass. This includes painting, acid etching, sandblasting, and engraving. All of these methods are applied to the surface of the glass after it has been formed and cooled. Assemblage or fabrication is the process of assembling preformed elements into larger or more complex structures.