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Working with Metal

These resources are intended for use by teachers to help you get started with making in the classroom.

The information was supplied by the artists who contributed to the *Skills in the Making* workshop programme 2009-12, funded by The Paul Hamlyn Foundation.



Introduction

Contemporary makers working with metal no longer simply concentrate on jewellery or working with precious metals. They use metal in all its forms to make sculptural work. Andy Hazell uses recycled and waste sheet metal from canning factories to make humorous figures and models that are informed and decorated by the colourful printed designs on the metal surface. Cathy Miles uses wire of different thickness to make three dimensional drawings and sculptures. Junko Mori's work is inspired by nature and consists of many modelled elements joined together while Ndidi Ekubia uses more traditional methods of metal smithing, raising flat sheets of metal into vessel shapes.

To see images of the work of The Making's metal artists, and the ideas that inform their work go to:

Cathy Miles: wire sculpture (image courtesy the artist)

www.themaking.org.uk/Content/makers/2008/09/cathy_miles.html
www.cathymiles.co.uk

Junko Mori: forged metal sculpture

www.themaking.org.uk/Content/makers/2007/06/junko_mori.html
www.junkomori.com

Andy Hazell: sheet metal sculpture and automata

www.themaking.org.uk/Content/makers/2008/03/andy_hazell.html
www.andyhazell.co.uk

Ndidi Ekubia: vessels and silversmithing

www.themaking.org.uk/Content/makers/2006/10/ndidi_ekubia.html
www.ndidiekubia.com

Celia Smith: wire bird sculpture

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http://www.themaking.org.uk/Content/makers/2011/04/celia_smith.html

<http://celia-smith.co.uk/>

Films

Links to makers in action can be found on their websites, but here are a few links

Wire sculpture with artist Steve Follen

<http://www.artisanam.org.uk/pages/workshops.php?artist=loop>

Junko Mori talks about her work at SOFA, New York

<http://www.youtube.com/watch?v=ZWw4AesiNz0>

Techniques

Metal can be used in many forms to create sculptural or functional forms.

Sheet metal can be cut if soft enough and bent or moulded into shapes.

Wire can also be bent and used to draw three dimensional shapes.

Harder metals, must be forged or heated in order to be shaped, by forming over a mould, bending, hammering or other treatments. These metals come in rods or blocks.

To join metal securely it has to be heated - welded or soldered.

Common terms explained

Elasticity: the ability of a metal to regain its shape after being deformed.

Hardness : resistance to being scratched or worn

Malleability: a malleable material can be hammered, spread or pressed into a desired shape

Ductility: a ductile metal can be drawn into fine wire

Brittleness: a brittle metal is apt to break easily and is usually hard

Tenacity: a metal which is resistant to breaking when stretched has tenacity

Work hardness: the condition brought on by the impact of hammer blows or other processes which alter the structure of the metal causing it to harden

Annealing: the process of heating metal to soften it once it has been work hardened so that it can be worked more easily

Hallmarking: Silver is a precious metal and is therefore stamped with a group of marks to verify its quality. For this the work is sent to one of the Assay Offices in the UK - in London, Birmingham, Sheffield or Edinburgh. The piece is tested for quality and if it passes is hallmarked. The hallmark is usually stamped on, or near, the base of a piece of work. It contains the maker's mark - usually their initials; a sterling stamp; a Fineness mark – the metal content; the assay office mark; and a date stamp.

Materials

Tin plate is a thin sheet of mild steel coated with tin. When the coating is removed rusting occurs. It is malleable and easily cut with tin snips

Copper or brass shim is a useful introduction to sheet metal as it is thin and can be easily cut with scissors and bent with the fingers.

Sterling Silver is white and is an alloy of 92.5% fine silver and 7.5% copper. It comes in sheet form or as wire. It is used commercially by jewellers and silversmiths.

Properties: soft, malleable, good conductor of heat, work hardens

Copper is reddish brown and is very soft, softer than sterling silver. It comes in sheets and

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as wire. It is malleable, a good heat conductor, and the work hardens

Brass is a yellow metal alloy of 70% copper and 30% zinc. It is tough and resists corrosion

Bronze is an alloy of copper and tin, which is much harder than copper and can be melted and cast. It resists corrosion.

Mild Steel is an alloy of iron and carbon, and is malleable and ductile.

Cast iron is an alloy of iron and carbon. It is brittle and cannot be forged but casts well.

Wrought iron is 99% pure iron with slight impurities. It is malleable and ductile.

Gold comes in various colours depending on the alloys it is mixed with, but the most common is yellow. It is malleable and ductile.

Aluminium is a white, light weight and low cost metal, common in everyday life. It is highly malleable and ductile.

Pewter is very malleable but also brittle. It can be formed, cast, soldered and sawn

Metal Wire

Iron wire is also called black annealed wire. Easy to manipulate and “draw” with. It will rust but can be spray painted, or painted with enamel paints such as Humbrol, or sealed.

Copper wire is easy to manipulate and is very soft. It does not rust.

Wire is sold by weight. The thickness is measured in millimetres.

Standard gauges for small to medium sculptures are: 0.7mm, 0.9mm, 1.2mm, 1.5mm

Tools

Tin snips, pliers and wire cutters and soldering irons can be bought at DIY shops.

More specialist equipment suppliers are below.

Metal Suppliers

Cookson Precious Metals www.cooksongold.com

49 Hatton Garden, London EC1N 8YN

K&M (wholesale Suppliers)Ltd Tel: 01142 474733. Fax: 01142 475335

Unit 24 Lion park, Holbrook Industrial Estate, New Street, Halfway, Sheffield S20 3GH

HS Walsh www.hswalsh.com 0207 242 3711/0121 236 9346

44 Hatton Garden London EC1 8ER

Rashbel UK www.rashbel.com Tel 0207 831 5646

24-28 Hatton Wall London EC1N 8JN

Columbia Metals www.columbiametals.co.uk 0207 732 1022

Wingfield Street, City of London, London SE15 4LH

Wire stockists

Ormiston Wire Ltd www.ormiston-wire.co.uk 0208 569 7287

The Making Contemporary Art Craft and Design,
Civic Offices, London Road, Basingstoke, Hampshire, RG21 4AH, UK.
T +44(0)1256 845 679 F +44(0)1256 350 080 www.themaking.org.uk



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1 Fleming Way, Worton Road, Isleworth, Middlesex, TW7 6EU
Many different gauges of wire

Wires.co.uk www.wires.co.uk 020 8505 0002,
Unit 3 Zone A, Chelmsford Road Industrial Estate, Great Dunmow, Essex, CM6 1HD
thinner iron wire and copper wire

General Art Supplies

Atlantis European Ltd www.atlantisart.co.uk 0207 377 8855
Britannia House, 68-80 Hanbury Street, London E1 5JL

Berol www.berol.co.uk 0844 4121126
Berol Customer Services Newell Rubbermaid Fradley Park, Lichfield, Staffs, WS13 8SS

Colourcraft Ltd www.colourcraftltd.com 0114 242 1431
Unit 6 555 Carlisle Street East Sheffield S4 8DT

Wire can be found in florist, DIY shops etc.

Recycled metal sheets, such as offcuts from industrial canning processes, can be found at recycling centres, and usually come with a printed coloured side and a metallic side.

Metals specialist websites

www.theabds.co.uk The Association Contemporary British Silversmiths

www.designerjewellersgroup.co.uk Designer Jewellers Group

www.baba.org.uk British Artist Blacksmiths Association

www.recyclemetals.org British Metals Recycling Association to find a recycling centre near you.

www.benchpeg.com Industry specialist website

www.silvertrust.co.uk The Silver Trust

www.bishopsland.co.uk Bishopsland Educational Trust: courses, fellowships, exhibitions

Metal Collections and displays in museums and galleries

www.vam.ac.uk/page/m/metalwork Victoria and Albert Metal collection

www.dazzle-exhibitions.com and www.lovedazzle.com four exhibitions a year of work by jewellers and small object makers and the related online collections.

www.bmag.org.uk/museum-of-the-jewellery-quarter Birmingham Jewellery Quarter Museum. A great small museum housed in an old jewellery factory. Stocks work by contemporary makers. Offers tours of historic factory and practical demonstrations and workshops.

www.museums-sheffield.org.uk/museums/millennium-gallery/exhibitions/current/metalwork-collection Sheffield Millennium Gallery houses a permanent collection of metal work. Also has temporary exhibitions.

www.fireandiron.co.uk Surrey based Fire and Iron Gallery: permanent displays and changing exhibitions

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www.craftscouncil.org.uk/whats-on/view/making-it-yours-metal/objects information about an educational exhibition of metal work with images and references. Intended for schools and colleges the exhibition can be hired from the Crafts Council.

Books

Leteri, Chris (2004) *Metals: Materials for Inspirational Design*, Rotovision
 McCreight, Tim (2004) *Complete Metalsmith*, Brynmorgan Press
 Miles, Cathy (2011) *Sculpting in Wire*, A & C Black

General Crafts Resources

Craft & Design Theory

Adamson, G. (Ed.) (2010), *The Craft Reader*. London: Berg
 Adamson, G. (2007), *Thinking through Craft*. London: Palgrave Macmillan
 Britton Newell, L. (2008), *Out of the Ordinary: Spectacular Craft*. London: V&A
 Dormer, P. (ed.) (1997), *The Culture of Craft*. Manchester University Press
 Dormer, P. (1994), *The Art of the Maker: Skill and its Meaning in Art, Craft and Design*. London: Thames and Hudson
 Frayling, C. (Ed.) (1991), *Beyond the Dovetail: Craft, Skill and Imagination*. London: Crafts Council
 Greenhalgh, P. (Ed.) (2002), *The Persistence of Craft*. London: A&C Black
 Harrod, T. (ed.) (1997), *Obscure Objects of Desire: Reviewing the crafts in the twentieth century*. University of East Anglia & Crafts Council
 McCullough, M. (1996), *Abstracting Craft: The Practiced Digital Hand*. London: MIT Press
 Papanek, V. (1979), *Design for the Real World*. London: Paladin
 Sennett, R. (2008), *The Craftsman*. London: Penguin
 Williams, G. (2009), *Telling Tales: Fantasy and Fear in Contemporary Design*. London: V&A

Articles/ reports

Clark, G. (2009), 'The Death of Crafts: A Post-modern Post-mortem' in *Crafts* No. 216 (January/February 2009) pp.48-51
 Crafts Council (1998), *Learning Through Making: A national enquiry into the value of creative practical education in Britain*.
 Creative & Cultural Skills (2009), *The Craft Blueprint*.
 Downing, D. (2005), *School Art- What's in it?* National Foundation for Education Research
 OFSTED (2009), *Drawing Together: art, craft and design in schools*.
 Williams, G. (2009), 'Tales of the Unexpected' in *Crafts* No. 219 (July/August 2009) pp.48-55

Journals

Crafts magazine: produced by the Crafts Council

Websites

www.themaking.org.uk craft development agency that promotes high quality contemporary art, craft and design and inspires new audiences to engage with the art of making. The website has information about 60 contemporary makers and links to their websites, and descriptions of crafts education events in schools and the community

www.artisancam.org.uk: videos of makers and pupils in action, step by step guides to making. A section for teachers: www.artisancam.org.uk/pages/teachers_notes.php includes demonstrations of basket weaving, ceramics, metal sculpture, jewellery and

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sci/art projects.

www.culture24.org.uk : information about museums and galleries across the UK: collections, exhibitions and events

www.craftscouncil.org.uk: information on UK crafts and learning programmes at www.craftscouncil.org.uk/learn/

www.csc.ucreative.ac.uk The Crafts Study Centre, Farnham has a collection and archive of twentieth century British Crafts. On-going exhibition and events programme.

www.engage.org National Association for Gallery Education. Case studies of working with schools in craft galleries and studios: www.engage.org/watchthisspace/studies.aspx

www.nsead.org: National Society for Education in Art and Design. Current issues in Art and Design education, Professional Development opportunities

www.teachersmedia.com the new Teachers TV: an archive of educational films on all subjects including craft and cross curricular work

www.craftspace.co.uk Birmingham based organisation with strong educational remit - case studies of school projects

www.craftanddesign.net information on contemporary craft galleries near you

Crafts Collections in Museums and Galleries

www.vam.ac.uk Victoria and Albert Museum international historic and contemporary international crafts.

www.britishmuseum.org British Museum historic crafts from around the world

www.csc.ucreative.ac.uk/ Crafts Study Centre Farnham, Surrey

www.manchestergalleries.org Manchester Art Galleries historic and contemporary craft and design collection

www.thebowesmuseum.org.uk Bowes Museum, County Durham
....and in a local museum near you search Culture 24

Contemporary Crafts galleries with changing exhibitions

www.caa.org.uk Contemporary Applied Art, London

www.ruthincraftcentre.org.uk, Ruthin Craft Centre Clwyd, Wales

www.bluecoatdisplaycentre.com The Bluecoat, Liverpool

www.harleygallery.co.uk Harley Gallery, Nottinghamshire

www.flowgallery.co.uk Flow Gallery, London

www.crafts.org.uk Devon Guild of Craftsmen, Bovey Tracey, Devon